loses. For example, Feiler translates the French *pirogue* as canoe when the original is preferable. Forster says "to increase my misfortunes." Feiler turns this as "to make matters worse." Forster, transliterating the original, speaks of a "dance of impudicity"; Feiler, of a "lewd dance" (p. 61). When a reader today turns to an 18th century travel narrative he anticipates the idiom of 200 years ago, and may delight in it. Forster's inexplicable omission of certain passages, such as Voltaire's couplet on syphilis, is a more serious count against the first English translation. But Feiler sometimes fails to understand the naturalists' parlance: Bossu's "pour en orner votre cabinet l'histoire naturelle" is rendered "that you could decorate your natural history study with it" (p. 97). "Cabinets" of natural "curiosities" were familiar in Bossu's day. And Feiler occasionally strays in his explanatory footnotes—for example (p. 84) when he compares the reputed musk of the Mississippi alligator with that of the true cervine musk of Asia (compare, Valmont de Bomare's *Dictionnaire* on this interesting topic). Although *Pliakmine* puzzled Forster, Feiler correctly identifies it as persimmon and *bluets* as huckleberries. Bossu's *la patate*, translated by Feiler as a "type of earth apple" (p. 131), is the sweet potato, more fully described by Du Pratz. Or, since it "tastes very much like chestnuts," could it be the Jerusalem artichoke? Only two of the four original plates are reproduced; six others from Lafitau and Seth Eastman are included. There's an index of generalities. But open the book and the hunt is on. Bossu tells a good story.

Schiel's journey to the Rocky Mountains, the Timpanagos, and the Humboldt is another translation from that bethel of historians, the University of Oklahoma Press. Edited by Thomas N. Bonner of the University of Omaha, Schiel's *Journey* is illustrated with uncolored reproductions of Kern's plates from the Pacific Railroad Report, by one of Schiel's fossil mollusk plates, and by Beeler's vignettes. Jacob [or is it James?] Heinrich Schiel was of Rhenish vintage, took a philosophy degree at Heidelberg, became a docent there, lectured on chemistry and geology, and then emigrated to America about 1848. Circumstances surely suggest Schiel followed Agassiz, Guyot, and Lesquereux, as a political exile. He served with Captain Gunnison, 1853 to 1854, as geologist and surgeon (though he was without a medical degree), kept a diary, geologized along the route, and was fated to miss the massacre of his Captain and seven comrades. Schiel published his *Reise* in 1859, evidently in a small edition, for only six copies have been located in libraries. Bachmann and Wallace published a translation in 1957 but they stint natural history. We wish for another Coues! There is Schiel's brief geology report. To be sure, we have had Captain Beckwith's narrative of the expedition, which incidentally is almost devoid of mention of Schiel: "To the pass [in the Humboldt Mountains], Dr. Schiel, geologist, gave the name of Agate, that stone being profusely scattered about in large blocks." When Beckwith made sorties of exploration it was generally in the company of Morris, Snyder, and Egloffstein. The historian of geology, G. P. Merrill, says Schiel's report "contains scarcely anything of value from a geological standpoint, being mainly mineralogical and lithological" and adds, "nothing was said concerning the probable geological age" of the fossil invertebrates.

Schiel was keenly interested in the Mormons, although he advised against joining them. He warned those "who may look with silent envy and perhaps secret desire upon the prerogatives of the saints," and with pride he reported that not more than three Germans had joined the Latter-day-Saints! Contrast Jules Remy's account from French eyes of his Mormon visit of 1855. *C'est la vie!*

"It is too bad," wrote Bossu, "that only a few savages inhabit such beautiful country."

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Alchemy to Organic Chemistry

Historical Studies in the Language of Chemistry. Maurice P. Crosland. Harvard University Press, Cambridge, Mass., 1962. xvii + 406 pp. Illus. $9.

There are as many ways of writing the history of science as there are of writing political, social, or economic history. One author may choose to write a narrative of events, another may prefer to deal with the ideas that influenced human actions, and a third may feel that the rich tapestry of the past can be properly revealed only through the biographies of great men. All these methods have been utilized in the history of chemistry. M. P. Crosland, however, has preferred to try something new, and the result is a fascinating book.

What Crosland has done is to view the history of chemistry through its changing nomenclature from the days of the alchemists to the end of the 19th century when organic chemistry became a mature science. He has modestly entitled his book, *Historical Studies . . .*, for he is eager to underline the fact that there is still much to be done. This is not the least merit of the volume for it opens up many new areas, and students of the history of chemistry, it is hoped, will soon move to explore them.

The five "studies" are entitled "The language of alchemy," "Early chemical terminology," "The introduction of systematic nomenclature into chemistry and the acceptance of the 1787 reform," "Chemical symbolism," and "The language of organic chemistry." Every reader will probably rank these studies in a different order, depending upon his interests and his specialized knowledge. I found the study of the language of alchemy completely fascinating and filled with an abundance of good sense and scholarship. Nowhere, I think, have the honest strivings and the dishonest fakery been so clearly described. The almost inevitable muddle in which even the most sincere alchemist found himself is also nicely delineated. The second study I thought a bit tedious and repetitious, although there is much of value in it. In Crosland's study of the reform of chemical nomenclature, I wish somewhat greater emphasis had been given to the philosophy of the Abbé de Condillac. Crosland fully recognized that Lavoisier's debt to Condillac was considerable, but the full impact of Condillac upon the French reformers is not adequately represented. Similarly, I felt that the effect of Sir Humphry Davy's "discovery" of chlorine was passed over rather quickly. After all, in naming chlorine and iodine Davy violated the spirit, if not the letter, of the French reformers, for he returned to the use of a physical, rather than a chemical, characteristic as the base of the new names.

The first three studies form a unity; the last two deal with problems somewhat more complicated than the mere naming of chemical compounds. The evolution of chemical symbols from antiquity to Berzelius is nicely de-

scribed, and the main trends are made perfectly clear. The treatment of the attempts to find a proper nomenclature for organic compounds is truly masterful and should provide the starting point for a whole host of further, more particular, studies.

Crosland's faults seemed few and minor to me. His style is a bit monotonous, and there are repetitious passages that could be eliminated. On the whole, however, the book is one that can be wholeheartedly recommended. It is an exciting work that should be indispensable to both the practicing chemist and the historian of chemistry.

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Nontechnical Earth Science

Earth, Sea, and Air. A survey of the geophysical sciences. Jerome Spar. Addison-Wesley, Reading, Mass., 1962. vii + 152 pp. Illus. Paper, $1.75; cloth, $2.95.

In recent years we have witnessed an unparalleled rekindling of interest in our earth and with it the need for an introductory, interdisciplinary text designed for readers with only a general high-school acquaintance with mathematics and science—readers who do not intend to make a career in science. This tidy little volume by a meteorologist who has distinguished himself in teaching and research will be welcomed by such readers as well as by anyone teaching a one-semester course on earth science for nontechnical students.

The first chapter is concerned with the earth as a member of the solar system. The basic laws of planetary motion are described from a historical point of view, and the motions of the earth are outlined in some detail, including their relation to our time base and the seasons. The development of our understanding of gravity is outlined with emphasis on the meaning of its variations with respect to isostasy and the structure of the earth. The section in which some of the most common types of map projections are described will help the reader to understand better the relation between projected maps and the characteristics of the areas represented.

The second chapter, on the solid part of the earth, is concerned with how geophysical studies provide information on the earth's major features. After a brief historical introduction, the contributions of seismology and geomagnetism are treated in some detail. The coverage of geological problems is of necessity brief in a short book of this type. The author has succeeded in directing attention to the principal areas where geophysical studies contribute to geological knowledge. As such, the book provides a valuable supplement to conventional treatments of earth science which emphasize surface geology.

Chapter 3, on the oceans, treats the topography of the ocean basins, the physical properties of ocean water, ocean currents, waves, and tides. An effective balance is achieved between descriptions of the phenomena and the methods used to observe them. Interactions of the atmosphere and ocean are emphasized in a way that makes clear the interdisciplinary nature of earth science. The excellent explanations of the phenomena are marred by an unfortunate confusion between the wind (drift) currents which disappear at a depth of a few hundred feet and the deeper currents which owe their origin to the wind; the deeper currents are geostrophic and disappear at an average depth of 4500 feet. The sequence of topics creates the false impression that the baroclinic geostrophic currents and wind-driven currents like the Gulf Stream are distinctly different phenomena.

The fourth and last chapter is about the atmosphere; Spar considers the composition of air, vertical distributions of temperature and pressure, the global circulation, weather systems, climate, and the special properties of the highest portions of the atmosphere. The treatment, though brief, is imaginative, interesting, and well balanced, and it includes a historical development of important concepts. The otherwise superb exposition is blemished by an incorrect picture of the meridional circulation in middle latitudes; in this treatment the westerlies are made to owe their existence at all levels to a northward component of their motion—a picture that is illogical (there must be a return flow at some level) and in disagreement with recent evidence that the westerlies derive their kinetic energy from large quasi-horizontal disturbances in the flow which also transport heat and momentum from low to high latitudes.

Several bonus features increase the usefulness of the book. There are numerous illustrations which are imaginatively conceived and well drawn. A section on laboratory exercises presents six experiments—on time, gravity, geomagnetism, ocean currents, waves, and weather observing. Finally there are lists of references to introductory texts on the material covered in each chapter.

Despite its minor flaws, this book serves as a very satisfactory introduction to earth science, and it is a much-needed addition to the elementary texts on this subject.

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Coordination Chemistry

An Introduction to the Chemistry of Complex Compounds. Aleksander Abramovich Grinberg. Translated from the second edition (1951) by J. Rovtar Leach. D. H. Busch and R. F. Trimble, Jr., Eds. Pergamon, London; Addison-Wesley, Reading, Mass., 1962. 384 pp. Illus. $15.

Until recently, chemists unable to read Russian have had to consult Feterowsky's German translation, *Einführung in die Chemie der Komplexverbindungen* (Technik, Berlin, 1955), in order to become acquainted with Grinberg's Stalin Prize-winning classic *Vvedenie v Khimiyu Kompleksnykh Soedinenii*. But this readable translation of the second Russian edition (1951) of Grinberg's book will enable English-reading chemists to investigate for themselves the approach of the "Russian school" to coordination chemistry.

This systematic survey, suitable for use as a text or reference book in intermediate and advanced inorganic chemistry courses, covers the entire field, largely from a physicochemical viewpoint, with emphasis on "descriptive" chemistry and stereochemistry. If the author seems to stress unduly the contributions of Russian chemists, it must be remembered that for many years the major proportion of research on platinum metal complexes, which are emphasized in this book, emanated from Russia and its world-famed Platinum Institute. The experimental and theoretical foundations of coordination chemistry, from its earliest beginnings up to 1951, are here discussed in a lucid and logical manner.

The volume has a decidedly historical flavor, with numerous references to specific researches; unfortunately, only a few of these are provided with