Applied Chemistry

Analysis of Ancient Metals. Earle R. Caley. Pergamon, London; Macmillan, New York, 1964. xii + 176 pp. $6.

One of the pleasures of being a chemist is the association with the wealth of interesting subjects on which chemistry has bearing. Volumes could undoubtedly be written on the uses of chemistry in archeology. One important use, the analysis of ancient metals, is described in the volume under review.

Why should the analysis of ancient metals be different from the analysis of ordinary metals? The author, Earle R. Caley, makes this quite clear. With the exception of the noble metals, ancient metallic objects are usually more or less heavily corroded. The prevalence of intergranular corrosion in particular introduces troublesome sampling difficulties. Furthermore, the archeologist is rarely interested in the composition of the corrosion products as such; he would like the chemist to reconstruct for him the composition of the original metal. In turn, the chemical composition can be an important clue to the origin of the object, the source of the ores employed, the state of metal technology, and perhaps the state of trade at the time the object was in circulation—in short all the information that the archeologist really wants. In the case of coins, the composition may even suggest whether the finances of the country were sound or were overly extended. A restriction frequently imposed on the analyst is that he may be working with an irreplaceable object and therefore must rely on nondestructive methods.

Caley gives specific laboratory directions for conducting analyses of ancient metals. He considers the general problem of heterogeneity and sampling, preliminary observations, qualitative tests, and choice of quantitative method, in introductory chapters that precede the chapters in which he deals with gold and its alloys, silver and its alloys, copper and its alloys, various nonferrous metals (principally lead, tin, platinum, antimony, and zinc) and their alloys, and iron and steel. Most of the quantitative chemical analyses described are gravimetric, including electrolytic deposition. Many of them are the result of Caley's original investigations. Other methods, such as specific gravity analysis, neutron activation analysis, x-ray fluorescence, x-ray diffraction, and emission spectroscopy (useful particularly for trace elements) are described where applicable. An important feature of the book is the extensive composition tables for various ancient alloys of known origin. The book also contains many references to original data.

The preparation of reports is discussed in the final chapter. Caley explains what the archeologist, who is usually untrained in chemistry, expects to obtain from the chemist. This authoritative book is an extremely practical and pleasant guide to one of the less well-known branches of applied chemistry.

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Nuclear Science

Nuclear and Radiochemistry. Gerhart Friedlander, Joseph W. Kennedy, and Julian Malcolm Miller. Wiley, New York, ed. 2, 1964. xii + 585 pp. Illus. $10.75.

It is a pleasure to see the new edition of this standard text. In the 9 years that have elapsed since the last edition, the inexorable accretion of new data and the development of new concepts in nuclear structure have required the authors to reappraise the text and make a thorough-going reorganization of their material. A most unfortunate circumstance, the untimely death of Professor Kennedy immediately after the appearance of the previous edition, deprived Friedlander of the inestimably valuable judgment and acumen of a great pioneer in nuclear chemistry. However, Friedlander was joined by Julian M. Miller in reworking the text, and together they have accomplished the task with insight and discrimination.

The new text runs some hundred pages more than the old—a result in keeping with the necessity for inclusion of new chapters on nuclear models and nuclear processes as chemical probes, as well as the fleshing out of the older material with new data. The attractive format is an improvement over that of the previous editions.

It is the good fortune of students, as well as faculty and interested intelligent nonexperts, that this book has been made available. It should be a well-thumbed addition to the desks and libraries of all who want a thorough-going and reliable introduction to nuclear science and to the desks and libraries of investigators active in researches on nuclear chemical processes as well.

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New Books

Mathematics, Physical Sciences, and Engineering

Analytical Chemistry of Molybdenum. A. I. Busev. Translated from the Russian edition (Moscow, 1962) by J. Schmorak. Israel Program for Scientific Translations, Jerusalem; Davey, New York, 1964. 253 pp. Illus. $13.50.

Analytical Chemistry of Ruthenium. T. D. Avtokratova. Translated from the Russian edition (Moscow, 1962) by IPST staff. Israel Program for Scientific Translations, Jerusalem, 1963; Davey, New York, 1964. 232 pp. Illus. $12.50.

Analytical Chemistry of Thallium. I. M. Korenman. Translated from the Russian edition (Moscow, 1960) by Z. Lerman. Israel Program for Scientific Translations, Jerusalem, 1963; Davey, New York, 1964. 144 pp. Illus. $6.75.

Analytical Chemistry of Thorium. D. I Ryabchikov and E. K. Gol'braikh. Translated from the Russian edition (Moscow, 1960) by A. Aladjem. Israel Program for Scientific Translations, Jerusalem, 1963; Davey, New York, 1964. 256 pp. Illus. $11.25.

Analytical Chemistry of Uranium. A. P. Vinogradov, Ed. Translated from the Russian edition (Moscow, 1962) by N. Kaner. Israel Program for Scientific Translations, Jerusalem, 1963; Davey, New York, 1964. 382 pp. Illus. $15.75.

Antarctic Snow and Ice Studies. Malcolm Mellor, Ed. American Geophysical Union, Washington, D.C., 1964. 289 pp. Illus. Plates. $12. Ten papers: "Glaciological studies at Wilkes Station, Budd Coast, Antarctica" (R. L. Cameron); "Glaciological studies in West Antarctica, 1960–1962" (H. Shimizu); "Horizontal strain and absolute movement of the Ross Ice Shelf between Ross Island and Roosevelt Island, Antarctica, 1958–1963" (J. H. Zumberge); "The Ross Ice Shelf Survey (RISS) 1962–1963" (W. Hofmann, E. Dorrer, and K. Nottarp); "Snow accumulation on the Ross Ice Shelf, Antarctica" (J. A. Heap and A. S. Rundle); "The drainage systems of Antarctica: Accumulation" (M. B. Giovinetto); "Densification of snow in Antarctica" (K. Kojima); "Firn stratigraphy studies on the Byrd-Whitmore mountains traverse, 1962–1963" (R. M. Koerner); "Structural glaciology of an ice layer in a firn fold, Antarctica" (J. R. Reid, Jr.); and "Distribution of particulate matter in a firn core from Eights Station, Antarctica" (L. D. Taylor and James Gliozzi).

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