solutions for the problems for typical instrumentation. A good applied radiochemist is a man who can achieve this same success with the particular nuclides and counting equipment required for his special problems. He would have to dig some, but the author has shown him the general problems and numerous examples of how they have been solved in typical cases.

The remaining quarter of the book deals with a wide-ranging selection of typical applications of radioactivity, going from chemistry to medicine and industry. Radioautography of thin slices is treated in some detail, but for biology alone; radiography, in similar detail for metallurgy. There is a small section on radiation protection problems and German legal requirements.

The book has 234 figures, a large fraction being plots with quantitative data for practical situations, although a few seem to be too highly specialized for the needs of the text. The literature references are fairly numerous and about one-half to the American literature, but they are not always to the most recent authoritative sources. On the whole, the book seems to be a good one for a general view of the very many ways radioactivity can be used as a tool in modern science and technology, and a useful one to encourage a new worker to broaden his techniques and to increase his abilities to use radioactivity effectively.

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Noble-Gas Compounds. Edited with Introduction by HERBERT H. HYMAN. The University of Chicago Press, 5750 Ellis Ave., Chicago, Ill. 1963. xiii + 404 pp. 16 × 24 cm. Price, $12.50.

The book is, in the main, a collection of research papers by many authors on the novel and relatively new noble-gas compounds. The papers are an "up-to-the-minute" report on work done between the time of the publication of Bartlett's work on Xe + PtF_6, June, 1962, and April 22, 1963, the opening day of the conference on noble-gas compounds held at the Argonne National Laboratory. This book is an out-growth of that meeting. The amount of research described in the book is indeed impressive, since less than 1 year elapsed from the preparation of the first xenon tetrafluoride to the completion of the manuscripts for the book.

The first section contains a presentation of four papers which are concerned with a chronological account of some noble-gas chemistry up to and including the preparation of XeF_4. The first paper by E. N. Hiebert of the University of Wisconsin on the discovery of argon is very well done and is exceedingly appropriate for this book because his theme emphasizes the painstaking care that Ramsay and Rayleigh gave to their experiments and the reluctance of their contemporaries, particularly Dewar, to accept the fact that there could be an element or elements that did not exhibit chemical properties.

The second paper by D. M. Yost of the California Institute of Technology describes his experimentation on xenon with chlorine and fluorine in 1933 but without success. Yost's new generation experimenters were led by Bartlett and Jha at the University of British Columbia with their experiments on Xe and PtF_6. They were quickly followed by Claassen, Malm, and Selig at the Argonne National Laboratory with their preparation of XeF_4.

Editor Hyman has logically divided the book into sections devoted to the particular type of research. These sections after the Introduction are: "Preparation and Some Properties of Noble-Gas Fluorides"; "Some Practical Considerations"; "Thermochemistry"; "Aqueous Chemistry of Noble-Gas Compounds"; "Diffraction Studies and the Structure of Xenon Compounds"; "Studies of Electron Spin Resonance, Nuclear Magnetic Resonance, Mössbauer, Infrared, and Raman Spectra and Related Experiments"; "Physiological Properties of Noble-Gas Compounds"; and "Theoretical Studies of Noble-Gas Compounds."

An outstanding feature of the papers in the book, other than their fascinating subject, is the detail given regardless of whether a paper is describing a preparative procedure, a physical measurement, or a molecular orbital calculation.

Editor Hyman has aptly remarked that in this assemblage of papers one can find a presentation that concerns almost every technique that modern chemistry, physics, and technology has made available. The relatively simple structured xenon compounds seem to be good illustrations for the demonstration of these techniques in this area of preparative, physical, and theoretical chemistry.

There are 58 papers and 105 contributing authors, and the quality of the research represented by these papers is probably higher than that on any other group of related compounds. In some few cases, further experiments since the publication of the book have modified the interpretation of data, but by and large, the book is as authoritative today as it was in April, 1963.

The book is remarkably free of typographical errors, and the quality of the printing and binding is excellent. The 14 unnumbered pages of glossy prints add a lot to the appearance of the book, but the regular page stock could have been used to perhaps reduce the price of the book.

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Theorie und Praxis der Gravimetrischen Analyse. Band I. Theoretischer Teil. By Dr. LÁSZLÓ ERDEY, Professor an der Technischen Universität Budapest, Mitglied der Ungarischen Akademie der Wissenschaften. Akadémiai Kiadó, Alkotmány U. 21, Budapest V, Hungary. 1964. 382 pp. 17.5 × 24.5 cm. Price, $9.00.

This is the first of three volumes on gravimetric analysis, which has the somewhat mysterious title of "Theoretical Part." Actually, most of the theory is covered in some 60 pages dealing with solubility and formation of precipitates and coprecipitation. This part is classical in nature, although the treatment is more extensive than in most introductory textbooks on analytical chemistry. However, in some respects it is not up-to-date; *e.g.*, no differentiation is made between homo- and heteronucleation, surface tension data originally given by Dundon have not been replaced with some more accurate values, and much space is devoted to the outdated von Weimarn theory. The scope of the book is wider than might be expected from the title. Thus, in the 100-page section on separations, some 50 pages are devoted to immiscible solvent extraction, chromatography (especially ion exchange), and volatilization separation.

The book is of much greater value to the practicing analyst than to the more academic analytical chemist. Operations for dissolving samples, destruction of organic substances, performance of precipitation, filtration, washing, drying, and ignition of precipitates are presented in great detail.

Volume II will deal with gravimetric determination of metals, and Volume III, of anions. These will be of special importance to the analyst, because the author and his associates have tested all the methods and have determined the thermal stability of the precipitates by derivative and straight thermogravimetric procedures.

Once upon a time, gravimetric analysis was the major method of analysis. It is still of fundamental importance for highly accurate analyses and for calibration of other techniques. However, its practice is now greatly reduced as a result of the development of a score of modern techniques. The present treatise may revive some interest in this classical method of analysis.

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Ultrahigh Vacuum and Its Applications. By RICHARD W. ROBERTS, General Electric Research Laboratory, and THOMAS A. VANDERSLICE, Vacuum Products, General Electric. Prentice-Hall, Inc., Englewood Cliffs, N. J. 1963. 199 pp. 16 × 23.5 cm. Price, $9.00.

Although ultrahigh vacuums were first obtained some 40 years ago by Langmuir, it is perhaps fair to say that pressures below 10^{-10} mm. are still regarded with awe by all but a relative handful of initiates. However, the actual and potential applications of ultrahigh vacuum techniques are increasing rapidly, and this small but very useful book is therefore highly welcome.

It concerns itself principally with the creation and measurement of ultrahigh vacuum and the relevant chapters—"Components" (pumps, gages, valves), "Materials" (glasses, ceramics, metals), "Ultrahigh Vacuum Systems"—are excellent, up-to-date, easily intelligible to the nonexpert, and rich in useful tabu-