most people the happy knack of seeing both the theoretical implications of a problem and its practical applications. This is in general well brought out by Rosenfeld, though there are some rather obvious gaps. Little or nothing is said about the important work on electric discharges in gases, and the practical significance of his improved vacuum pump is scarcely mentioned. On the other hand there is probably more emphasis on the Lewis-Langmuir octet theory of valence than its importance warrants. It was definitely out of the main stream of chemical physics and was of course very quickly superseded by the more fundamental ideas of Bohr and his quantum-mechanical successors.

There is a great deal of emphasis on the human side of Langmuir, his family relationships and his association with professional colleagues at home and abroad. Some indeed may feel that there is a bit too much of this, but it certainly makes for interesting reading and will obviously appeal particularly to younger readers, who are eager to learn what a great scientist was really like. A good photograph of Langmuir serves as a frontispiece. However, a generous insertion of relevant illustrations would have made the volume even more appealing.

Asimov on noble gases

THE NOBLE GASES. By Isaac Asimov, 161 pp. Basic Books, New York, 1966. $4.50

by Charles F. Eck

This book is an interesting, popular history of the noble gases. The author, a prolific expositor of science, is associate professor of biochemistry at Boston University School of Medicine. He has written numerous popular books on physics, chemistry and biology and has recently received the James T. Grady award for outstanding science reporting.

Asimov covers discovery, structure, supply, uses and inertness of the noble gases. In the book, for example, may be found an account of the difficulties and long delays before the first noble gas in the atmosphere, argon, was discovered. Helium, because of its importance, has a separate chapter. A chapter on fluorine furnishes the background for the noble-gas compounds, and the book ends with a chapter on their formation, beginning with Bartlett's preparation of xenon rhodiofluoride.

Asimov points out that there is a large supply of noble gases in the atmosphere, noting that even the rarest isotopes of the noble gases, such as helium-3 and xenon-126, exist there in tonnage quantities. The author's statement (page 105) that helium-3 "has no practical uses" is in error. Currently, helium-3 is used in neutron detectors, low temperature refrigerators and cryostats, gas lasers and nuclear bombardment studies. The supply of helium-3 for the above uses is not from the atmosphere; it is obtained as a byproduct of nuclear technology.

This book reveals the wide effect noble gases had on the development of science: Their discovery provided a test of the periodic table; the field of cryogenics was broadened with the liquefaction of helium; and the domain of inorganic chemistry was extended with the formation of noble-gas compounds. Accordingly, this book serves as enjoyable background reading for science students and laymen as well as those who were science students some years ago. It has an index, but no references.

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The reviewer, group leader of stable isotopes separation at Mound Laboratory, Miamisburg, Ohio, has been separating noble-gas isotopes by the thermal diffusion process for six years.

An unconventional introduction

ABOUT VECTORS. By Banesh Hoffmann. 134 pp. Prentice-Hall, Englewood Cliffs, N.J., 1966. $4.35

by Peter L. Balise

Reading in the preface that this book is intended to "disturb and annoy," and reading further at random, one discovers here a most unconventional introduction to n-dimensional vectors. Indeed the author does disturb by continually raising questions, sometimes unanswered, that force the reader to consider whether he really understands the concepts. Because it is