of sacklike containers; the entries under "bind" fill nearly three pages. This sort of thing will be of great help to the desperate systematist in search of a new name in some large genus, or to anyone else in search of a root on which to graft a new word in this day of complex molecules and disintegrating atoms. A further aid are the special sections here and there in the lexicon, such as the discussion of diminutives (under "little") and figures of speech; these are listed in the index. A typical entry gives the derivation, combining forms, and gender of the word. Pronunciation has been omitted, since this is debatable for Greek and Latin, but the author's recommendations are to be found in some sprightly passages (with amusing examples) in the introduction. It does not seem possible that a book this size should be innocent of typographic error, but after several days of dipping into it here and there, I have been unable to find one.

In short, this is the dictionary that many of us have long been waiting for, and it should be on the shelf of all who want to understand the words they use.

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An Autumn Gleaning. Occasional lectures and addresses. Henry H. Dale. Interscience, New York; Pergamon Press, London, 1954. x + 225 pp. $4.25.

This is a collection of lectures and addresses delivered between 1935 and 1952 by the venerable British medical scientist, Henry Hallett Dale.

This volume presents a wealth of material on the development and nature of the intellectual, moral, and social aspects of science during the last century, particularly in medical research. It reflects the valiant struggles of man with life under the increasingly confusing impact of rapidly growing science and technology.

Typical of these essays is the Huxley memorial lecture on viruses. Dale discusses the controversial literature by Tyndall, Pasteur, Buffon, Huxley, Needham, and others on spontaneous generation and its relation to the modern researches on the generation of ultramicroscopic viruses and bacteriophage.

Extracts from his five wartime presidential addresses to the Royal Society present such problems as the relatively long-range advantages of freedom in individual research and of organization in group research; the dangers of entangling science with politics; the dangers of neglecting fundamental in favor of applied research; the importance of recognition of achievement in the more fundamental and academic ranges of science; the significance of the numerous meetings held during the war in commemoration of the tercentenary of the birth of Newton, not only in English-speaking countries but also in such out-of-the-way places as Novosibirsk: "Newton's achievement is a part of the common heritage of all peoples"; and the evils of secrecy forced upon science and government by the new conception of "total war."

Dale's other lectures include history of the discovery and use of insulin; freedom and function of science (Benjamin Franklin's question to candidates for admission to the scientific junto was: "Do you love truth for truth's sake, and will you endeavor impartially to find and receive it for yourself, and communicate it to others?"); science in education; accident and opportunism in medical research; medical research as an aim in life; Thomas Addison as a pioneer of endocrinology; the mechanism of anaphylaxis; and transmission of effects from nerve endings.

This book should be of interest to the numerous professional admirers and friends of Henry Dale as well as to philosophically minded laymen not overwhelmed by the implication of the equation $E = mc^2$.

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Physics and Mathematics

Concepts of Space. The history of theories of space in physics. Max Jammer. Harvard Univ. Press, Cambridge, Mass., 1954. xvi + 196 pp. $3.75.

This is a scholarly history of the concept of space, starting from antiquity and extending to contemporary times. The great scientists and religious leaders pass in rapid kaleidoscopic procession, each contributing his concept of the space which forms the universe. In early times, and even in much of Newton's philosophy, contemporary theology restricted the notions of cosmology. Gradually the experimental approach became predominant. One sees how Isaac Newton considered geometry as a phase of mechanics, but insisted that the center of mass of the sun's planetary system must be at absolute rest. Leibnitz and Huyghens argued for relative motion. The argument was finally settled by the Michelson-Morley experiment. Then Riemann became the prophet of non-Euclidean space. To test this hypothesis, Gauss hauled surveying equipment up to the tops of three high mountains, and when he did not detect any deviation from 180° for the sum of the interior angles of the triangles formed by the three mountain peaks, he concluded that space was indeed Euclidean. Lobachevski tested the hypothesis using astronomical triangles, and so began our modern attack on cosmology.

In a brilliantly written foreword, Einstein divides the basic concept of space into two viewpoints: "(a) space as positional quality of the world of material objects; (b) space as container of all material objects." One gathers that general relativity merges the two concepts into one. That is, space can be thought of as boxes but the size and shape of these boxes are modified by the presence of matter.

Max Jammer is to be congratulated on the large and interesting selections of excerpts that he has given from original documents. Most of these are given in Latin, French, or German. Although for true scholars the subtle meanings might be lost in translation, for more casual readers footnotes providing the transla-