of x. More generally the conclusion is valid if $f(x)$ is merely required to be bounded in the neighborhood of one value of x. More abstractly, in an inner product vector space with $\mathbf{x}$ a variable vector, for any such bounded linear functional there is a fixed vector $\mathbf{v}$ such that $f(\mathbf{x}) = \mathbf{v} \cdot \mathbf{x}$.

The present booklet pursues its abstractions with many concrete examples, stopping on almost every page to illustrate the general theory with familiar instances. The generalities themselves are clearly suggested by classical theorems. Thus after careful introductory paragraphs defining Banach space and linear normed rings, functions reminiscent of polynomials are described. Convergent infinite sums of such monomials are the analytic functions of this theory. Examples are the iterated and resolvent kernels of Fredholm integral equation theory.

The Fréchet differential is next introduced and its use in general perturbation theory explained. For example, the formulas for the variation in the solution of an integral equation due to a perturbation of its kernel are exhibited in very simple general forms. Similar readily apprehended formalities show the dependence of the solution of a differential equation on the coefficient functions in that equation.

The book is carefully and clearly written in simple, nonidiomatic French. With its subject matter in appliable mathematics and its numerous historical references, the book presents a good introduction to abstract functional analysis.

Dictionary of Guided Missiles and Space Flight. Edited by Grayson Merrill, C. W. Besserer, K. A. Ehricke, & B. B. Small. 688 pp. D. Van Nostrand Co., Inc., Princeton, N. J., 1959. $17.50. *Reviewed by Robert E. Street, University of Washington.*

ALTHOUGH this is the fifth volume in the series *Principles of Guided Missile Design,* it can by its very nature of being a dictionary be considered independent of the other volumes of the series. Rather it is intended, as the editor says, to be a sequel and companion to the *International Dictionary of Physics and Electronics* by the same publisher. The physicist who is familiar with the latter dictionary will find this one to be quite similar. The most common terms used in the field are defined both verbally and sometimes mathematically, when the latter is relevant. Quite a few terms are duplicated but on the whole the majority of mathematical and physical terms are not.

For example, terms in thermodynamics, kinetic theory, dynamics, etc., which were well defined in the earlier volume, are not repeated here. This does lead to some lack of balance, i.e., vector notation is used in some definitions but the definitions of the vector terms themselves are in the physics dictionary. Quite a number of physics and electronics words are given in expanded form, such as transistors, which now take up nine pages instead of two; many more fluid flow terms and a complete treatment of astronomical terms

which were almost entirely absent in the other dictionary now appear.

In the first edition of a complex endeavor such as this it is easy to find definitions which one can criticize as unclear, incomplete, or meaningless but the majority are well done and some are quite excellent. It was the hope of the editor that the book would help to establish a common language in this field. On the whole it does succeed in this purpose, and should help those familiar as well as those not so familiar with guided missiles and space flight to achieve this end. A minor but attractive feature of the book is the inclusion of several good photographs of rockets and models of space vehicles.

Elements of Materials Science: An Introductory Text for Engineering Students. By Lawrence H. Van Vlack. 528 pp. Addison-Wesley Publishing Company, Inc., Reading, Mass., 1959. $8.50. *Reviewed by Peter L. Balise, University of Washington.*

THE teaching of engineering materials is undergoing a revolution, changing from a largely empirical consideration of materials' gross properties to a more scientific study of materials structure. This is part of the larger revolution, in which much knowledge that formerly was in the province of physics is now common engineering practice. Although the process of discoveries in pure science eventually being applied in engineering has been going on since the beginnings of science, it is most notable recently because of its accelerating rate.

Much yet remains to be understood about the relations between a material's structure and its behavior, but knowledge has advanced far enough to permit the engineer to predict approximately the properties of a material on the basis of its composition. Courses in engineering schools at present range from the traditional empirical approach to a rigorous study of solid-state physics. For those who take a position near the middle but definitely on the scientific side, Van Vlack's introductory text is perhaps the most suitable one now available.

The first half of the book is concerned with the internal structure of materials, proceeding from atomic forces and arrangements to crystals, phases, microstructures, and macrostructures. Although the emphasis is on clear and visual representations, there do not appear to be excessive simplifications at the expense of accuracy. Examples are given usually in terms of engineering applications which should hold the engineering student's interest, while the physics student might want a more thorough theoretical analysis.

The second half of the book is devoted to the behavior of materials in service under various types of stresses and conditions, including thermal reactions, corrosion, electromagnetic fields, and radiation. Standard subjects such as creep and fatigue are discussed, but there is much additional description of new applications such as magnetic drilling and irradiation of