"vector space" (although "algebra" is defined) or "quotient group" (although the phrase and the concept are ultimately used, without warning); definitions of abstract concepts that are given are almost never linked to one another (e.g., the underlying additive group of a ring or field is not mentioned); in fact, the only groups that are treated as such are groups of permutations or matrices.

Lastly, we should mention a third contrast between the present text and the one above. A fatal carelessness pervades the whole book, even when abstract concepts are only in the background. To give two examples, the reader is hard put to it to discover in any particular section whether "number" means real number or complex number (see especially the section on orthogonal matrices); linear dependence of a set of vectors is defined incorrectly (the phrase "scalars not all zero" is omitted) and so is linear dependence of one vector on a given set of vectors (the phrase "scalars not all zero" is included). This kind of carelessness finally leads the author into at least two real errors: (1) A gap in the proof of Wedderburn's theorems, where the author uses without proof the existence of a unit element in a semi-simple algebra, the "justification" presumably being this blanket statement a few sections back: "If an algebra does not possess a modulus [unit element] then a modulus may be *adjoined*. . . . It will be assumed henceforth that if necessary a modulus has been adjoined." (2) Theorem II, Chapter X, p. 156 is false. It reads: "If $F(\xi_1, \xi_2)$ is the extension field obtained by adjoining to F two roots ξ_1, ξ_2 of an irreducible equation in F, then the correspondence $\xi_1 \to \xi_2$, $\xi_2 \to \xi_1$ constitutes an automorphism of the extension field [over F]." A counter-example is provided by any cyclic extension field of degree > 2.

DANIEL ZELINSKY

Linear transformations in n-dimensional vector space. An introduction to the theory of Hilbert space. By H. L. Hamburger and M. E. Grimshaw. Cambridge University Press, 1951. 10+195 pp. $4.50.

Since the purpose of this book is clearly indicated by its title and subtitle, this review can consider first the order (quite reasonable) and clarity (good) with which the authors present their material.

The vector space V_n considered is always the space of sequences of n complex numbers. The scalar product, linear dependence, linear subspaces, orthogonal complements, and the algebra of linear transformations are discussed in Chapter I. Chapter II describes the elementary properties of Hermitian, normal, unitary, and projection operators and their eigenmanifolds. Chapter III derives the spectral