solution of a set of simultaneous equations. The method of difference equations for a square lattice is explained and applied to such examples as the Dirichlet problem. Further topics include proof of existence and uniqueness of a solution, estimate of error, convergence of the iteration process for solving the equations, relaxation, triangular and hexagonal nets, method of least squares, the Ritz method, Trefftz' method, use of series of known functions, eigenfunctions, and eigenvalues.

Chapter V deals mainly with integral equations, and explains methods where the integrals are replaced by sums, methods of iteration, use of series, cases of singular integral equations, Volterra's equation, and closes with some examples of functional equations.

The text is enlivened by interesting numerical examples, some short biographical notes, and appropriately has as its frontispiece a photograph of C. Runge.

W. E. MILNE

*Linear algebra and matrix theory.* By R. R. Stoll. New York, McGraw-Hill, 1952. 15+272 pages. $6.00.

In this treatment of the algebra of matrices with elements in a field, the author adopts the modern viewpoint that the linear transformations are the basic objects for study, rather than their carriers, the matrices. Abstract algebraic concepts are introduced as they arise. (It should be observed that this "background of modern algebra" consists of really elementary concepts, and does not include, for example, such a powerful tool as the Krull-Schmidt theorem.) A number of the usual proofs have been replaced by fresh ones. For example, the reduction of symmetric matrices is done so carefully that Kronecker's reduction is a very easy consequence. The important similarity problem is solved by adapting the arguments developed for division rings to the present case. (Cf., for example, N. Jacobson, *The theory of rings*, Chap. 3.) The discussion of normal transformations in (finite-dimensional) unitary and Euclidean spaces is more thorough than usual.

The author has naturally left to the reader the duty of supplying some of the details. Besides these "natural" exercises, there are ample lists of more formal exercises and many illustrative examples. There is an index and a useful list of the special symbols employed.

This text is heartily recommended to the teacher of matric theory who feels obliged to introduce his students at the same time to basic concepts of modern algebra.

M. F. SMILEY