tion on the existence of a singular point of a series on the circle of convergence remains unanswered. The answer as well as a formal definition of continuation will evidently appear in the second volume. This delay seems to be the only disadvantage of an otherwise effective instructional arrangement.

Chapter 9 contains the residue theorem together with applications to the principal of the argument, summation theorems, inverse function theorems and a proof of a case of the general implicit function theorem.

The errors in this book are very rare. The format and binding are attractive. The author has composed a lucid account of the basis for analytic function theory. Analysts will look forward to the appearance of volume two.

GUY JOHNSON

Topological analysis. By Gordon Thomas Whyburn. Princeton, Princeton University Press, 1958. 12+119 pp. $4.00.

The purpose of this book is to apply certain topological methods to the study of the theory of functions of a complex variable and to the generalization of some of these results to mappings that are light and open. The book is well written and the author is to be commended for an excellent job in the blending of topology and classical analysis. The first three chapters consist of topics selected from the author's *Analytic topology* (Amer. Math. Soc. Colloquium Publications, vol. 28, New York, 1942). However some changes in methods have been introduced. For example, by first showing that the continuous monotone image of the unit interval is a simple arc the author uses this to show that every locally connected continuum is arcwise connected and then uses this result to prove the characterization of a simple arc. The fourth chapter is concerned with standard definitions and elementary topics of complex variables. The fifth chapter is concerned with defining and developing properties of the topological index. This is the main topological tool used in the sequel. In the sixth and seventh chapters the topological index is used to develop results summed up in the following statement. If the complex valued function $f(z)$ is nonconstant and differentiable everywhere in a region R of the complex plane then f is light, f is strongly open, f has scattered inverse points, f is locally topological at a point z_0 in R if and only if $f'(z_0)\neq 0$ and f is locally equivalent to a power mapping. These methods have not as yet shown that $f'(z)$ is continuous or open but do show that $f'(z)$ has closed and scattered point inverses. In chapter eight standard results on zeros and poles of meromorphic functions, the theorem of Rouché and the theorem of Hurwitz are proved. The ninth chapter is concerned with light and open mappings on 2-dimensional manifolds. In the final chapter ten the Hurwitz theorem is proved without any assumption about the derivative of the limit function and quasi-open mappings are studied.

EARL J. MICKLE

Integral equations. By F. Smithies. Cambridge tracts in Mathematics and Physics, no. 49, Cambridge University Press, 1958. 10+172 pp. $4.50.

This work is devoted to the theory of nonsingular linear integral equations. Most of the book concerns equations with L_2 kernels, but many results are stated for continuous kernels, the proofs being given only if they differ significantly from the L_2 case. Although the notations of operator theory are used throughout, the results are not presented in the framework of linear spaces. Thus stronger expansion theorems are obtained than would have been possible in the more general formulation.

After a first chapter of preliminaries, Chapter II deals with the resolvent kernel and the Neumann series. The notion of relatively uniform convergence for sequences of L_2 functions is introduced in this chapter and is used throughout the book in many of the expansion theorems. For example, the Neumann series for the solution of the linear integral equation of the second kind is shown to be relatively uniformly absolutely convergent. The determinant-free Fredholm theorems are presented in the third chapter. Kernels of finite rank are first studied, and the results are extended by approximation to the general L_2 kernel. Chapter IV is devoted to the theory of orthonormal systems. In Chapters V and VI the formula for the solution of the linear integral equation of the second kind in terms of the Fredholm determinants is derived, for continuous kernels in Chapter V, and for L_2 kernels in Chapter VI. Hermitian kernels are studied in detail in Chapter VII, and the theory for these kernels is developed independently of the Fredholm theory. Expansion theorems for the kernel and its iterates are given, and the results are used to obtain the solution of the corresponding nonhomogeneous integral equation as an expansion in terms of the characteristic system. Definite kernels are discussed, and a section is devoted to the extremal properties of the characteristic values. The final chapter treats singular functions and singular values, with application to the theory of normal