It is a tribute to both the author's powers as an expositor and to his sure feeling for what is important and what is not, that despite the very considerable progress made in the theory of conformal mapping in the intervening years the book has retained its old freshness. There is much that could be added to the book, but there is hardly anything that should have been omitted. The style is concise without being obscure—a combination not often found in present-day mathematical writing—and the presentation is rigorous without being tedious or overly symbol-laden. In addition to still being a valuable introduction to the subject, the book is a model of mathematical exposition.

It goes without saying that the book is not an adequate introduction to the present state of the theory of conformal mapping. For example, the mapping of multiply-connected domains has been left out altogether (except in the doubly-connected case). Curiously enough, no mention is made even of what was known in this field at the time the first edition was written. The author must have shared the view—rather widely held at that time—that since the universal covering surfaces are simply-connected, the study of simply-connected domains would eventually take care of the general case.

The first two chapters contain a detailed discussion of the linear transformation and of the Klein-Poincaré non-Euclidean geometry based on the group of linear transformations of a circle onto itself. Chapter III considers some elementary mappings, and Chapter IV discusses Schwarz' lemma and some of its ramifications. Chapter V deals with the theory of normal families and includes the by now classical proof of the Riemann mapping theorem based on an extremal property of the mapping function. Chapter VI is devoted to the investigation of the boundary behavior of conformal mappings, while Chapter VII studies the mapping of closed surfaces. Chapter VIII, the only one not contained in the first edition of the book, reproduces the elegant and astonishingly short proof of the general uniformization theorem given by van der Waerden in 1941.

Z. NEHARI

Ideal theory. By D. G. Northcott. Cambridge University Press, 1953. 8+111 pp. 12s. 6d.

This is an excellent exposition of the basic facts about Noetherian rings, that is, commutative rings with unit element and ascending chain condition for ideals. Starting from scratch (no knowledge of modern algebra is assumed) the author proceeds clearly and efficiently up to the deeper parts of ideal theory that are used today in algebraic geometry. The transparency of style makes the book excellent for use as a text or for the practicing mathematician who wishes to absorb the essentials of the theory quickly and painlessly. The expert will be especially grateful for the unified presentation of results which, except for the more elementary parts already available in several texts, have thus far appeared only in Ergebnisse-style monographs or in the many widely scattered original papers of the last 25 years.

The chapter headings are: I. The primary decomposition. II. Residue rings and rings of quotients. III. Some fundamental properties of Noetherian rings. (This includes Krull's intersection theorem, symbolic powers of prime ideals, composition series for primary ideals, and dimension theory.) IV. The algebraic theory of local rings. (Including accounts of regular local rings and the quasi-gleichheit theory.) V. The analytic theory of local rings. (The existence of a local ring's completion and some transition properties.) The book ends with brief notes indicating the history and applications of the theory. The applications indicated are of course to algebraic geometry, but the author quite naturally refrains from identifying the two subjects.

Polynomial rings appear only incidentally or as examples and no mention is made of their unique factorization. Very little is said about rings of dimension one and even the theory of Dedekind rings, whose full development would have required about one extra page at the appropriate place, is omitted. Field theory, valuation theory, the structure theory of complete local rings, the important relations existing between the ideals of a ring and an integrally dependent over-ring, the Hilbert function, and unmixedness theorems are either missing entirely (presumably for reasons of space, connectedness and essentiality) or are mentioned in passing, in the notes at the end. There is a brief bibliography, most of whose items are made mainly of historical interest by the present tract. A brief list of the best (as opposed to the earliest) references would have been of more help to the unguided reader wishing to pursue the subject further.

MAXWELL ROSENLICHT

Complexes linéaires. Faisceaux de complexes linéaires. Suites et cycles de complexes linéaires conjugués. By A. Charrueau. Paris, Gauthier-Villars, 1952. 84 pp.

This memoir, as far as new contributions to the theory of linear complexes are concerned, is based primarily on a series of notes of the author appearing in the *Comptes Rendus* (Paris) during 1948