and testing becomes largely symbolic. More need by mathematicians for a mixed APL LISP environment may push computer science to develop a good one. In the world of systems, traffic, not theory, promotes development.

Since a significant part of mathematics education deals with conjecture and proof, this book suggests how the computer could play an important part. For example, the study of calculus, both elementary and advanced, would benefit enormously from the inclusion of an experimental component that goes far beyond the usual elementary numerical analysis applications. Grenander is implying that with skill in programming and use of APL, the experiments can be significant and the programming labor need not dominate the effort required to master either the art or mechanics of mathematics.

REFERENCES

1. J. Moses, *Algebraic simplification, a guide for the perplexed*, Comm. ACM **14** (1971), 527–537.
2. R. Wilensky, *Lispcraft*, Norton, New York, 1984.
3. L. Gilman and A. Rose, *APL—an interactive approach*, Wiley, 1984.

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Chain conditions in topology, by W. W. Comfort and S. Negrepontis, Cambridge Tracts in Mathematics, Vol. 79, Cambridge University Press, New York, 1982, xiii + 300 pp., $39.50.

Set theory and topology have been bedfellows for a long time. Hausdorff's classic text *Mengenlehre* [**2**], for example, devotes only four chapters to set theory; the remaining six, which comprise three-quarters of the book, deal with point-set topology, especially the theory of metric spaces. Perhaps a better translation of the title would be *The theory of point sets*. A similar approach is found in Kuratowski's book [**3**], except that he devotes even less space to set theory, and he has the decency to entitle the book *Topologie*. And while these books were being composed, Sierpinski was gathering the material, largely topological, which would make up his book [**5**] on the continuous hypothesis.

More recently, after a period during which the two subjects developed separately, there has been a dramatic *rapprochement*, the unifying factors being Cohen's discovery of forcing and the subsequent explosion of work in set theory. Consider, for example, the history of the normal Moore space conjecture, which asserts that every normal Moore space is metrizable. (See M. E. Rudin's monograph [**4**] for an account of all but the most recent parts of this story.) First F. B. Jones showed that if $2^{\aleph_0} < 2^{\aleph_1}$, then every *separable* normal Moore space is metrizable. Then Bing showed that if there is Q-set, i.e., an uncountable set of real numbers every subset of which is a relative F_σ, then there is a nonmetrizable separable normal Moore space, and later Silver deduced from Martin's Axiom (see below), which had recently been shown