BOOK REVIEWS

Recursiveness, by Samuel Eilenberg and Calvin C. Elgot. Academic
Press, New York and London, 1970. vii+89 pp.

Jorge Luis Borges (see e.g., Borges [1962]) has made impressive use
of an unusual literary device—the review of a nonexistent book. There
are ideas better conveyed by hinting at their elaboration elsewhere
than by any such elaboration. In reading Eilenberg and Elgot (hence-
forth, E²), one senses the lack of such a review, for by elaborating
mathematical details to the exclusion of all motivation, E² have
robbed the reader of many of their insights.

The preface of this book makes a bold claim:

"On the one hand, it appears that a more algebraic, less arithmetic
point of view [than is usual in the study of computable (recursive)
functions] has been sought, and on the other hand, a theory of pro-
grams for digital computers appears to be the long-range aim. · · ·
This short monograph is a contribution to the latter activity. Its
algebraic flavour is more or less obvious. Its connection with com-
puter science is less obvious."

And then it promises that little aid will be given the reader in
evaluating this claim:

"Because of the novelty of the approach, known theorems often
appear in unfamiliar guises. Because of this we have not attempted to
assign authorship to the theorems."

By writing the book instead of the review, E² have made it hard for
us to accept their claim—for while they have recast the *elements* of
recursive function theory in the spirit of modern algebra, and have
made minor use of operations somewhat like those of automata
theory, they advance no evidence that their approach contributes
more to computer science than other approaches. In fact the words
'computer' and 'program' do not appear to recur in the volume after
the preface! However, one knows that Elgot has thought much about
theories of programming—see, for example, Elgot and Robinson
[1964], which is *not* cited by E²—and so why Elgot chose to give no
hint of his expertise in this monograph is a mystery. A good theory of
programs probably will be heavily algebraic—perhaps E² were not so
far from the spirit of Borges when they claimed their book as a fore-
runner!

E²'s aim, though nowhere explicated in the monograph, seems to
have been presented by Eilenberg in lectures as follows: "Much of the
power of modern mathematics has arisen with the development of