

cussions of the nature of mathematics and mathematical thinking, some old-fashioned and some up-to-date. They illustrate the principle that there are at least as many ways of thinking about mathematics as there are mathematicians. There are many biographical and historical selections. Since the chief interest of mathematicians, outside of mathematics, seems to be the personalities of other mathematicians, there is much here to interest the professionals. There are remarks on the general subject of "numbers," ranging from an enquiry into the question of whether birds can count to Dedekind's own account of irrational numbers. There is fascinating material on applied mathematics (my term, not the editor's), much of which seems to be more applications than mathematics: the discovery of Neptune, the problem of determining longitude, the periodic table of the elements, Haldane's famous essay *On being the right size*, Eddington on the constants of nature, Malthus on population. There is an assortment of essays on probability and statistics (it is a pity that room could not have been found for Feller's deflation of the St. Petersburg paradox, when so much of the traditional well-meant nonsense about it is included). There is a lucid exposition of Gödel's theorem by Nagel and Newman, and there is an essay that Lewis Carroll would have enjoyed (written especially for this anthology by Nagel) on *Symbolic notation, Haddock's Eyes, and the dog-walking ordinance*. There are particularly interesting essays on computing machines by von Neumann, Turing and Shannon. Apparently just to show how far one can attempt to go, there are selections from G. D. Birkhoff's writings on ethics and aesthetics. A real novelty is the inclusion of five selections from mathematics in fiction, ranging from *Gulliver's Travels* to *The New Yorker*.

All in all, this is an anthology with the faults of its genre and more virtues than most specimens of its kind, especially in the set of mathematical anthologies of which it is almost the only example. It has as legitimate a place in any mathematician's library as the *Oxford Book of English Verse* has in that of a specialist in English literature.

R. P. BOAS, JR.

*Logic, semantics, metamathematics*. Papers from 1923 to 1938. By Alfred Tarski; translated by J. H. Woodger. Oxford, Clarendon Press, 1956. 14+471 pp. 60 shillings.

Since most of the papers that make up this volume have become an essential part of the modern logician's equipment by now, it would be out of place to offer a review of their content at this time; what follows is a brief descriptive report.

Although Tarski has written extensively on several parts of mathe-