

## Book Review

Stewart Shapiro. *Philosophy of Mathematics: Structure and Ontology*. Oxford University Press, Oxford, 1997. xii + 279 pages

**1** Structuralism heretofore has not had quite the same standing in the field of philosophy of mathematics as logicism, formalism, constructivism, nominalism, and so on: it has not been an 'ism any writer surveying field with a pretension to comprehensiveness would feel absolutely obliged to examine at length. That may change with Stewart Shapiro's book. The book is an extended exposition and defense of a distinctive version of structuralism in which the author considers the familiar questions in philosophy of mathematics, and also—this being one of the book's more significant if less conspicuous contributions—raises several less familiar questions, and in every case articulates a structuralist response. Shapiro is the first philosopher to devote a whole book to defending structuralism (though Michael Resnik's recent book and Geoffrey Hellman's older one are also much concerned with structuralism) and the book can be expected to remain required reading for some time to come. In examining the issues it treats here, the most efficient strategy will be the least imaginative one: to follow the author, chapter by chapter, through the questions, summarizing his response to each, and interspersing any critical commentary of my own as we go along.

**2 Realism** Passing over an Introduction which may be more effective as a summary to be read after reading the book, Shapiro begins, in his first chapter, by considering what the relationship between philosophical principle and mathematical practice has been and should be. He decides for the space of this book to confine his attention to philosophical positions that aim only to *interpret* rather than to *change* mathematical practice. What does this exclude from consideration? Mainly certain among the so-called *antirealist* positions.

So-called antirealists are all troubled by one or another aspect of *orthopraxis*, or currently accepted practice in mathematics, and specifically by the practice of making certain kinds of assertions when doing mathematics. Antirealists may be classified one way by the kind of assertion that troubles them. Thus the *constructivists* are troubled by assertions like (1) below and *nominalists* by assertions like (2) below