
This collection, part of a very valuable library for working philosophers, is exactly devoted to the topics indicated by its title and subtitle. In fact, the limits of logic are combined here with first-order logic, higher-order logic and the Löwenheim–Skolem theorem, more precisely the downward Löwenheim–Skolem theorem: if a countable set of formulas has a model, it has also a denumerable model. This explanation is important, because there is another problem that can be baptized “The limits of logic”, namely concerning the relation between classical and non-classical logic. All of the papers selected by Stewart Shapiro exclusively address the question: which logic, first- or higher-order is the right logic? Another good problem “which logic, classical or non-classical (e.g. intuitionistic, many-valued, modal, etc.) is the right logic?” is not even mentioned. This is not an objection, but is meant as an indication as to what the reader can expect from the book.

The collection begins with a short but very informative introduction by the editor. He states the problem and its history. Roughly speaking, logic emerged as higher-order (Frege, Russell). Then, first-order logic was extracted by Löwenheim, Skolem and the Hilbertians. This development raised several problems, for instance, what is the relation between logic and set-theory? Last but not least, the question which logic is the right logic was stated and divided logicians into “first-orderists” and “higher-orderists” (in particular, “second-orderists”). Gödel and Quine belong to the first camp, Barwise, Boolos, and Shapiro to the second one. In a sense, higher-orderism is a revolt of *logici juniores* against *seniores* who mostly

believed in first-order logic as the right logic. However, this division into *juniores* and *seniores* is not without exceptions.

The book is divided into four parts: I. Is second-order logic logic? (papers by Gregory H. Moore, Leslie H. Tharp, George H. Boolos, Stewart Shapiro, Alfred Tarski, Steven J. Wagner, Ignazio Jané, and P. Simons); II. Ontological reduction, intended interpretations, and the Löwenheim–Skolem theorems (papers by Leslie H. Tharp, Virginia Klenk, John Corcoran, Charles McCarty, Neil Tennant, and Stewart Shapiro); III. Plural quantification (papers by George H. Boolos and Michael Resnik); IV. Philosophy of set theory (papers by Thomas Weston, Alexander George, Paul Benacerraff, Crispin Wright, Nino B. Cocchiarella, and Peter Clark). All papers were earlier published, not later than 1971.

Papers contained in Part I are historical (Moore) or offer an analysis of the concept of logic (the rest). Moore’s papers outlines a broad panorama of the history of logic (in our century) and its interplay with mathematics. The rest of the papers either defend first-order logic as the right logic (Tharp, Wagner, and Jané) or recommend second-order logic (Boolos, Shapiro, and Simons) or yet take a neutral position (Tarski). The defenders of the thesis that logic is the right logic appeal to various so called “good” properties (compactness, completeness, etc.). The opposite camp maintains that “bad” properties of second-order logic are not so bad or compensated for by practical utilities of this logic. Finally, Tarski in his typical manner (i.e. without committing himself to a definite opinion) says that various points of view are possible: the type-theoretical framework unifies logic and mathematics, the first-order framework separates them. Let me add that the editor is an honest man. Although he is a declared second-orderist, he included papers strongly opposite to his own position.

Everybody who tries to answer the question “Which logic is the right logic?” should remember a remark of Boolos: “It is of little significance whether second-order logic may bear the (honorific) label ‘logic’ or must bear ‘set theory’ ” (p. 69). Boolos is right: the main question cannot be reduced to a terminological controversy. Of course, we cannot logically prove which system should be honoured by calling it ‘logic’. The issue is typically philosophical and requires an analysis. As I already said particular authors appeal to various properties and tasks of logic as “good”, “bad”, “essential”, “important”, etc. Should logic be reduced to a deductive code? Or should we rather look at logic as a language with a great expressive power? It is difficult to consider these questions in a review. However let me make a remark. It seems that universality is an important property traditionally linked with logic. We have various concepts of universality: (a) logic is universally applicable, (b) logic is universally valid;