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LOGIC AND THE INDISPESABILITY ARGUMENT

In this paper, I will present a brief reasoning which I believe has some promise for further elaboration.

Inside the Academy, controversy surrounds the question of whether logic is a philosophical discipline, a mathematical discipline, or even a psychological discipline. When it comes to logic as a branch of mathematics, there is a weak approach to understanding it (only mathematical logic, starting with the algebra of logic, can be considered a branch of mathematics) and a strong approach to understanding it (all logic is a branch of mathematics since the thinking with which logic deals is a consequence of the human brain's computing capabilities). If it is accepted that logic is a sort of mathematics, then logic should be studied, as well, by the philosophy of mathematics, and the philosophy of logic should be a section of the philosophy of mathematics. Furthermore, the issues (for instance, categoricity, computation, foundations for mathematics, mathematical proof, or pluralism) and trends (for instance, constructivism, intuitionism, formalism, logicism, nominalism, Platonism, predicativism, or structuralism) typical for the philosophy of mathematics should be extended onto logic. One of such issues that could be extended onto logic is so called "Indispensability Argument" (see [1; 3]).

Mathematics is extensively applied to the sciences – it is an evident and unquestionable fact. With this in mind, W. V. O. Quine [4] and H. Putnam [2] did not simply argue that mathematics was indispensable for the (empirical) sciences, but that the indispensability of mathematics for empirical sciences gave us good reason to believe in the existence of mathematical entities. They argued that references to mathematical entities or quantification over mathematical entities, such as sets, numbers, functions, and the like, were indispensable for our best scientific theories, and so we should be committed to the existence of these mathematical entities. To act otherwise is to be culpable of what Putnam called "intellectual dishonesty" [2, p.347]. More importantly, according to W. V. O. Quine and

H.Putnam, mathematical entities are believed to be on the same epistemic level as other theoretical entities of science because belief in the existence of the former is justified by the same evidence that supports the theory as a whole (and, therefore, belief in the latter).

The Indispensability Argument can be pictured as the following syllogism:

“*We ought to have ontological commitment to all and only the entities that are indispensable to our best scientific theories.*

Mathematical entities are indispensable to our best scientific theories.

We ought to have ontological commitment to mathematical entities” [1].

If we agree that logic is a sort of mathematics, then the Indispensability Argument should apply to logic. What this means is that we ought to believe in the existence of logical entities, such as logical forms (schemes of concepts (notions), judgments, propositions, conclusions, and so on) and logical laws (of identity, non-contradiction, excluded third, and so on). For logic the Indispensability Argument can be pictured as the following syllogism:

We ought to have ontological commitment to all and only the entities that are indispensable to our best scientific theories.

Logical entities are indispensable to our best scientific theories.

We ought to have ontological commitment to logical entities.

From the above, it can be assumed that logical forms and laws exist not only through the specific nature of the human cognitive apparatus and its artificial tuning but nearly objectively, similar to mathematical entities in the terms of mathematical Platonism.

References

1. Colyvan M. Indispensability Arguments in the Philosophy of Mathematics. URL: https://plato.stanford.edu/entries/mathphil-indis/