

# EPISTEMOLOGICAL CONSTRUCTIVISM

LAURA CROSILLA

Traditional approaches to the philosophy of mathematics center around two sets of questions:

- What is the subject matter of mathematics (if any)? (Ontological question).
- How do we get to know in mathematics? (Epistemological question).

Often the epistemological question has been seen as ancillary to the ontological question; for example, if we claim that mathematics deals with abstract objects, then we owe an explanation on how we are granted access to such objects.

Constructive mathematics Bishop style [1, 2] is mathematics based *only* on intuitionistic logic [4, 3]. That is, it uses intuitionistic rather than classical logic, but it does not add any further specific principles which conflict with classical mathematics. A question naturally arises of which philosophy of mathematics is compatible with constructive mathematics so conceived. A very promising approach has been suggested by Douglas Bridges in [3], and sees today's constructive mathematics as an answer to the epistemological rather than the ontological question on the nature of mathematics. In particular, the main characteristic of constructive mathematics, one which paradigmatically distinguishes it from classical mathematics, is its requirement of a constructive methodology, that is, the adherence to a constructive notion of proof. In this talk I will discuss aspects of a philosophy of constructive mathematics along these lines.

## REFERENCES

- [1] E. Bishop, *Foundations of constructive analysis*, McGraw-Hill, New York, 1967.
- [2] E. Bishop and D. S. Bridges, *Constructive analysis*, Springer, Berlin and Heidelberg, 1985.
- [3] D. S. Bridges, *Constructive mathematics*, The Stanford Encyclopedia of Philosophy (2009), <http://plato.stanford.edu/entries/mathematics-constructive/>.
- [4] F. Richman, *Intuitionism as generalization*, *Philosophia Mathematica* **5** (1990), 124–128.

SCHOOL OF PHILOSOPHY, RELIGION AND HISTORY OF SCIENCE, UNIVERSITY OF LEEDS  
*E-mail address:* `matmlc@leeds.ac.uk`