Idaho State University
Department of Mathematics & Statistics

COLLOQUIUM

Why Have Mathematical Foundations? Some Remarks on the Philosophy of Mathematics.

What do we mean by the foundations of mathematics? Most people think of the foundations as perhaps a basic set of axioms or perhaps methods of proof. Perhaps you think of set theory as the foundation of all mathematics. What I wish to focus on are the following questions:

1. What is the point of having such a foundation?

2. How is this point related to one's philosophy of mathematics?

Let me clarify the second question first. I am thinking here of what one takes mathematics to be about. There are formalists who hold that mathematical objects are those constructed by the adoption of a formal system, and have their being within the formal system, so to speak. There are Platonists who hold that mathematics is about intellectual objects that we grasp by an intellectual sense analogous to our other senses. During the nineteenth-century quest for mathematical foundations, there were still many Kantians, who held that certain fundamental forms of intuition, namely space and time, were a priori and that these intuitions provided the grounding of all mathematics (time for arithmetic, space for geometry). Logicists hold that mathematics is ultimately just an extension of logic. Discovering the roots of mathematics, on this view involves seeing the underlying logic.
Why search for mathematical foundations at all? Often the reason given for seeking mathematical foundations is given as epistemological: We want a ground the certainty of mathematics. No doubt, the development of alternatives to Euclidian geometry played a big role here: some thought that the development of multiple geometries posed a threat to the certainty of mathematics, in that we had no basis, except for a dubious empirical one, to decide which geometry (if any) was the true one. After the discovery of the set-theory paradoxes, there was another concern: Is the mathematics we are working with really consistent? Do the assumptions we make contain hidden contradictions?

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Friday, December 1, 2017
4:00 pm in PS 308

For colloquium attendees, there will be light refreshments in PS 317 at 3:30