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SPECIAL ISSUE: MATHEMATICAL METHODS IN PHILOSOPHY EDITORS' INTRODUCTION

ALDO ANTONELLI
University of California

ALASDAIR URQUHART
University of Toronto

RICHARD ZACH
University of Calgary

Mathematics and philosophy have historically enjoyed a mutually beneficial and productive relationship, as a brief review of the work of mathematician–philosophers such as Descartes, Leibniz, Bolzano, Dedekind, Frege, Brouwer, Hilbert, Gödel, and Weyl easily confirms. In the last century, it was especially mathematical logic and research in the foundations of mathematics which, to a significant extent, have been driven by philosophical motivations and carried out by technically minded philosophers. Mathematical logic continues to play an important role in contemporary philosophy, and mathematically trained philosophers continue to contribute to the literature in logic. For instance, modal logics were first investigated by philosophers and now have important applications in computer science and mathematical linguistics. The theory and meta-theory of formal systems were pioneered by philosophers and philosophically minded mathematicians (Frege, Russell, Hilbert, Gödel, Tarski, among many others), and philosophers have continued to be significantly involved in the technical development of proof theory and to a certain degree also in the development of model theory and set theory. On the other hand, philosophers use formal models to test the implications of their theories in tractable cases. Philosophical inquiry can also uncover new mathematical structures and problems, as with recent work on paradoxes about truth. Areas outside mathematical logic have also been important in recent philosophical work, for example, probability and game theory in inductive logic, epistemology, and the philosophy of science. Formal epistemology is an emerging field of research in philosophy, encompassing formal approaches to ampliative inference (including inductive logic), game theory, decision theory, computational learning theory, and the foundations of probability theory.

It in fact seems that technical mathematical work is currently enjoying something of a renaissance in philosophy. And so the idea of a workshop on just such topics held at a conference center for the mathematical sciences was developed. From February 18–23, 2007, 40 researchers who apply mathematical methods to current issues in philosophy congregated at the Banff International Research Station (BIRS) in the Canadian Rockies for a workshop on 'Mathematical Methods in Philosophy'.[1]

[1] http://www.birs.ca/birspages.php?task=displayevent&event_id=07w5060

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Fig. 1. Front row (left to right): W. W. Tait, Alasdair Urquhart, Jeffrey Ketland, and Timothy Williamson. Second row: Solomon Feferman, Wilfried Sieg, Kai Wehmeier, Roberta Ballarin, Ray Jennings, and Gillian Russell. Third row: Kenny Easwaran, Eric Pacuit, JC Beall, Eleni Kalyvianaki, Paolo Mancosu, Grigori Mints, Audrey Yap, and Marcus Kracht. Back: Rafal Urbaniak, Michael Glanzberg, Aldo Antonelli, Kate Manne, Patricia Blanchette, David DeVidi, Steve Awodey, Philip Ebert, Agustin Rayo, Gabriel Uzquiano, Richard Zach, Volker Halbach, Stewart Shapiro, Byeong-Uk Yi, Graham Priest, Greg Restall, and Delia Graff Fara. Not pictured: Branden Fitelson, Harvey Friedman, Elaine Landry, Hannes Leitgeb, Joan Rand Moschovakis, Yiannis Moschovakis, and Sherrilyn Roush.

These mathematical methods come mainly from the fields of mathematical logic and probability theory, and the areas of application include philosophical logic, metaphysics, epistemology, philosophy of mathematics, and philosophy of science. It is a fortuitous coincidence that the Association of Symbolic Logic now has a third journal, *The Review of Symbolic Logic*, the scope of which more or less covers the topics of the BIRS Workshop, and so it is only fitting that this special issue of the *Review* collects some of the papers presented at the workshop.

Many of the topics of the workshop are represented here: Steve Awodey and Kohei Kishida contribute the most straightforwardly logical paper, in which they give a topological interpretation of first-order modal logic. Delia Graff Fara marshals the full resources of possible-world semantics to develop a relative-sameness counterpart theory for *de-re*

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modal predication. Graham Priest studies modal many-valued logics and applies them to Aristotle's problem of future contingents. The papers by Sol Feferman, Hannes Leitgeb, and Greg Restall are on theories of truth—while Feferman expands on his celebrated previous work, both the papers by Leitgeb and Restall make connections to other topics, to epistemic probability and to possible-world semantics, respectively. The contribution of Stewart Shapiro and Gabriel Uzquiano, finally, touches on set theory, the foundations of mathematics, and what concepts there are. Two further papers from the workshop would have rounded out the range of issues: a paper on confirmation theory by Branden Fitelson ('Goodman's "New Riddle"') and one on the philosophy of logic by Gillian Russell ('One True Logic?'). At the requests of the authors, they are published in the *Journal of Philosophical Logic*.

We would like to take this opportunity to again express our gratitude to the BIRS board and director for the exciting and wonderful opportunity to hold the workshop, to the BIRS staff (especially Brenda Shakotko) for helping with the arrangements and for making us feel at home in Corbett Hall, and to Mathematical Sciences Research Institute (MSRI), Pacific Institute for the Mathematical Sciences (PIMS), and the University of Calgary Research Grants Committee for providing travel funding. Thanks are also due to the participants, who are mainly responsible for making the workshop a success, and to the referees for their invaluable service.

DEPARTMENT OF LOGIC AND PHILOSOPHY OF SCIENCE
3151 SOCIAL SCIENCE PLAZA
UNIVERSITY OF CALIFORNIA
IRVINE, CA 92697-5100, USA
E-mail: aldo@uci.edu

DEPARTMENT OF COMPUTER SCIENCE
10 KING'S COLLEGE ROAD
UNIVERSITY OF TORONTO
TORONTO, ONTARIO M5S 3G4, CANADA
E-mail: Urquhart@cs.toronto.edu

DEPARTMENT OF PHILOSOPHY
UNIVERSITY OF CALGARY
CALGARY, ALBERTA T2N 1N4, CANADA
E-mail: rzach@ucalgary.edu

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