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## INTRODUCTION: 8 BRIDGES BETWEEN MAINSTREAM AND FORMAL EPISTEMOLOGY

A divide seems to have been running between those epistemologists relying largely on conceptual analysis and focusing on examples and counterexamples for advancing or rejecting various epistemological theses, and those applying a variety of tools and methods from logic, computability theory or probability theory to the theory of knowledge. The two strands of thinking, and the traditions to which they are taken to belong, have unfortunately proceeded largely in isolation from one another.

Recent trends in contemporary epistemology, however, signals a great deal of interest for the intersection between mainstream and formal epistemology. It turns out that the two traditions have much in common, and may be bridged for their mutual benefit and the advancement of epistemology in general. Here are 8 ways of doing it as the invited papers in this special issue of *Philosophical Studies* demonstrate the fruitful interaction between informal considerations and various formal apparatus in order to support, sharpen, undermine, realize, or contribute in some other pertinent way to fundamental epistemological themes.

Epistemology is largely organized around the two central goals of on the one hand defining and securing knowledge while defeating skepticism and on the other modelling the dynamics of epistemic and doxastic states. These two goals are not mutually exclusive although mainstream epistemology has largely focused on the former while formal approaches have concentrated on the latter. Three bridges are built which places epistemic logic – starting with Hintikka (1962) – in relation to these two general epistemological ambitions. In “Where’s the Bridge? Epistemic Logic and Epistemology”,

Vincent F. Hendricks and John Symons (see also Hendricks and Symons, 2005a, 2005b) discuss the sense in which epistemic logic may be viewed as running in parallel with mainstream epistemology as to classical issues like defining knowledge, “forcing”,<sup>1</sup> skepticism, and the questions of rational inquiry. Demonstrating the affinities between epistemology and epistemic logic is also the topic of Johan van Benthem’s “Epistemic Logic and Epistemology: The State of Affairs” where epistemic logic is pertinently pitched back and forth between its importance to mainstream epistemology and its interdisciplinary relations and applications in computer science, game theory and “social software”.<sup>2</sup> In “On Logics of Knowledge and Belief” Robert Stalnaker examines the logics of knowledge and belief and their semantics in greater detail and connects mainstream defeasibility and causal theories of knowledge to epistemic and doxastic logic.

The intertwined relationship between the two goals of epistemology is discussed further in “Rationality and Value: The Epistemological Role of Interdeterminate and Agent-Dependent Values” by Horacio Arló Costa; then attention is specifically directed to epistemological classics like theory selection, changing view, fixing beliefs and some new solutions are presented when dealing with indeterminate epistemic values like simplicity and coherence. In “Coherence in Epistemology and Belief Revision” Sven Ove Hansson starts out with another classic – foundationalism vs. coherentism – and then brings the machinery of belief revision theory initialized by Alchourrón et al. (1985) to bear on this theme in order to sharpen and precis the coherentistic motto of “all beliefs support each other” which in the end implies accepting epistemic priority to some beliefs over others in order to avoid coherentistic absurdities. Coherentism and degree of belief continue in “An Impossibility Result for Coherence Rankings” in which Luc Bovens and Stephan Hartmann consider the relation between justification and coherence in the sense of whether the coherence of the incoming information with background assumptions is an important determinant in the

degree of belief attached to the new information. To stay in doxastics, an important concern in mainstream epistemology is the relation between formation of belief, doxastic obligations and doxastic voluntarism which are formally handled by Heinrich Wansing in “Doxastic Decisions, Epistemic Justification, and the Logic of Agency”. Wansing develops a formal framework for ascriptions of belief formation which in turn contribute to understanding the dynamics of belief and its obligatory or voluntary doing or undoing.

The dynamics of epistemic states are often addressed in the light of induction. In turn, inductive inference and knowledge acquisition have always been intimately conjoined. In “Inductive Incompleteness” Matthias Hild proves that there are logical limits to this relation since either a method cannot allow its own inductive infallibility or if it does there exists a hypothesis which is non-inferable by an inductive method but the non-inferability is not realizable by the method itself. The fact that the method cannot infer non-inferability, violates the principle of negative introspection; an often assumed principle of rationality and reflection in epistemic logic.

The application of formal methods does wonders on the object-level of epistemology and the interaction between formal and mainstream approaches works miracles on the meta-level of conducting epistemology, i.e. the methodology of epistemology. There is much more machinery to be used in epistemology than intuition pumps and the method of possible cases, but formal methods per se do not make for philosophical pertinence. Hacking once argued that a progressive research program is characterized by “plethora”, the ability to produce new and interesting phenomena. The interplay between sound mainstream considerations and the use of methods from logic, learning theory, probability theory, game theory, computer science and the like makes for a “plethoric” epistemology and reveals the interdisciplinary field epistemology truly is.

## NOTES

<sup>1</sup> The term epistemological “forcing” was coined in Hendricks (2001) , Hendricks (2003) to denote the strategy of defeating skepticism by delimiting the set of possibilities over which the inquiring agent has to succeed: If the agent can succeed over the relevant possibility set then the agent may still be said to have knowledge even if he commits grave and many errors in other but irrelevant possibilities cited by the skeptic. For a monograph-length systematic survey of forcing in mainstream and formal epistemology, refer to Hendricks (2005) (for a new perspective on knowledge and skepticism in the limiting case refer to Hendricks and Pritchard (2006)).

<sup>2</sup> “Social software” is a term coined by Rohit Parikh denoting the use of methods from epistemic logic, game theory, belief revision and decision theory to study social phenomena. For more, refer to Hansen et al. (2005).

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