

LOGICAL ANALYSES OF (SCIENTIFIC) REASONING:  
AN INTRODUCTION

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From December 2001 till December 2004, the Science, Innovation and Media Department of the Ministry of the Flemish Community (Belgium) and the State Committee for Scientific Research of the Republic of Poland funded a cooperation project (Bilateral Scientific and Technological Cooperation Project BIL01/80) between two Flemish and two Polish research centres. The Flemish partners were the Centre for Logic and Philosophy of Science of Ghent University and the centre with the same name of the Free University of Brussels. The Polish partners were the Chair of Logic and Philosophy of Science of the University of Zielona Góra and the Group of Logic and Cognitive Science of N. Copernicus University (Torun).

The purpose of the project was the logical and historical analysis of some issues in the philosophy of science (such as: causation, induction, theory building, ...) and the theory of knowledge (such as: ampliative reasoning, the presuppositions of assertions, problem solving, the issue of how questions arise, ...). The historical results will be published in a special issue of *Logic & Logical Philosophy*. This issue of *Logique et Analyse* is dedicated to the results of the logical analyses.

In order to achieve their aims, the partners in the cooperation project organised four workshops: VlaPoLo6 (*The Dynamics of Reasoning in the Sciences: Adaptive and Interrogative Perspectives*, Ghent, 17-19 October 2002), VlaPoLo7 (*Problem Solving in the Sciences: Adaptive and Interrogative Perspectives*, Brussels, 8–10 May 2003), VlaPoLo8 (*Flemish–Polish Workshop on Adaptive and Erotetic Logics and their Application to the Philosophy of Science*, Zielona Gora, 20–22 November 2003) and VlaPoLo9 (*Patterns of Scientific Reasoning: Adaptive and Interrogative Perspectives*, Ghent, 6-8 May 2004).

The papers in this issue can be divided into three groups. First, we have four papers which provide logical analyses of problems from the philosophy of science: *Causal Discovery Using Adaptive Logics. Towards a More Realistic Heuristics for Human Causal Learning* (Maarten Van Dyck), *Applications of the Adaptive Logic for Causal Discovery* (Leen De Vreese & Erik

Weber), *The Basic Inductive Schema, Inductive Truisms, and the Research-Guiding Capacities of the Logic of Inductive Generalization* (Diderik Batens) and *A Logic for Theories in Flux* (László Pólos & Michael T. Hannan). The first two papers deal with causation, the third with induction, the fourth with theory building.

In the second group we have five papers which provide logical analyses of more general reasoning processes: *Strawsonian Presuppositions and Logical Entailment* (by Jacek Malinowski, on the presuppositions of assertions), *erotetic Search Scenarios, Problem-solving, and Deduction* (by Andrzej Wiśniewski, on problem-solving), *Fuzzification of Groendendijk-Stokhof Propositional erotetic Logic* (Libor Běhounek), *Sieving Out Relevant and Efficient Questions* (Kristof De Clercq & Liza Verhoeven) and *Questions and Logical Analysis of Natural Language: the Case of Transparent Intensional Logic* (Michal Pelis). The last three papers deal with the way in which questions arise.

Finally, we have five purely logical papers which develop logical tools that, in the future, can be used for similar analyses as the ones presented in the other papers: *A Rich Paraconsistent Extension of Full Positive Logic* (Diderik Batens & Kristof De Clercq), *Socratic Proofs for Some Modal Normal Propositional Logics* (Dorota Leszczyńska), *An Adaptive Logic Based on Jaśkowski's Logic  $D_2$*  (Marek Nasieniewski), *Direct Dynamic Proofs for Classical Compatibility* (Dagmar Provijn & Joke Meheus) and *How to Synthesize a Paraconsistent Negation: the Case of CluN* (Mariusz Urbański).