



## Introduction: History and Philosophy of Logical Notation

Francesco Bellucci, Amirouche Moktefi & Ahti-Veikko Pietarinen

To cite this article: Francesco Bellucci, Amirouche Moktefi & Ahti-Veikko Pietarinen (2018) Introduction: History and Philosophy of Logical Notation, *History and Philosophy of Logic*, 39:1, 1-2, DOI: [10.1080/01445340.2017.1372881](https://doi.org/10.1080/01445340.2017.1372881)

To link to this article: <https://doi.org/10.1080/01445340.2017.1372881>



Published online: 11 Oct 2017.



Submit your article to this journal [↗](#)



Article views: 2526



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 2 View citing articles [↗](#)



# Introduction: History and Philosophy of Logical Notation

FRANCESCO BELLUCCI<sup>†,‡</sup>, AMIROUCHE MOKTEFI<sup>†</sup> AND AHTI-VEIKKO PIETARINEN<sup>†,§</sup>

<sup>†</sup>Tallinn University of Technology, Estonia <sup>‡</sup>University of Bologna, Italy <sup>§</sup>Nazarbayev University, Kazakhstan  
[francesco.bellucci4@unibo.it](mailto:francesco.bellucci4@unibo.it); [amirouche.moktefi@ttu.ee](mailto:amirouche.moktefi@ttu.ee); [ahtiveikko.pietarinen@nu.edu.kz](mailto:ahtiveikko.pietarinen@nu.edu.kz)

Received 21 August 2017 Accepted 25 August 2017

What is a logical notation? Intuitively, a notation is a sort of language, and a logical notation is a language for the representation of logic. Since at least the seventeenth century, methods of representing logical expressions have made use of symbols, diagrams, charts and graphs, rather than items of historical or natural languages alone. The phrase ‘philosophy of notation’ was coined by the American logician Charles S. Peirce in 1885 to mean ‘the illustration of principles which underlie all algebraic notation’ (*Peirce 1885*, p. 183). If with the expression ‘philosophy of logic’ it is currently meant the philosophical study of the nature and types of logic, with the expressions ‘philosophy of notation’ and ‘philosophy of logical notation’ we mean the philosophical study of the nature and types of notation and, in particular, logical notation.

The scope of the philosophy of logical notation seems intuitive. For example, the question of whether the conditional ‘If  $P$ , then  $Q$ ’ is best understood as a Philonian or a Diodorean conditional is a question that does not seem to be a matter of notation. By way of contrast, the question of whether the material conditional ‘If  $P$ , then  $Q$ ,’ interpreted as a Philonian conditional, is best represented as ‘ $P \supset Q$ ’ or as ‘ $(P(Q))$ ,’ is a question of philosophy of notation. As another example, the question of which syllogistic moods are valid is not a mere matter of notation, while the question of which of the various graphical ways of representing syllogistic (Euler’s and Venn’s circles, Lambert’s linear diagrams, Peirce’s logical graphs, etc.) is to be preferred is to a large extent a question of philosophy of logical notation. Intuitively, we may say that a notational-philosophical question depends on the language in which it is posed and may not survive across translation among languages. Also, given that logical notations are products of historical agents and in historical contexts, historical developments greatly inform notational investigations. In this sense, the history of logical notation is as important as their philosophy.

The papers in this special issue discuss logical notations from historical and philosophical perspectives, and thus contribute to the identification of this exciting emerging realm of philosophy of notation. Jens Lemanski’s contribution offers a detailed historical reconstruction of the use of geometrical diagrams in seventeenth and eighteenth century Germany. He shows how such notations were used within two academic circles which pre-date Leonhard Euler who popularized those diagrams but was far from being the first to employ them. The second paper by Anna-Sophie Heinemann expounds the logical notation and theory of quantification presented by Augustus De Morgan in 1850. In this paper the specific notational features of De Morgan’s are examined in detail. Heinemann shows that the notation is both an instrument to express inferences and to prove their validity. The next

paper by Dirk Schlimm investigates the propositional fragment of Frege's *Begriffsschrift* notation. It highlights characteristic features that distinguish it from other expressively equivalent notations. Analysis of similarities and differences between expressively equivalent notations is genuinely a question of philosophy of logical notation. In this sense, Schlimm's paper perfectly epitomizes the aims and purposes of this special issue. The fourth paper, co-authored by the guest editors, is a historico-philosophical investigation into the problem of logical analysis in four figures of late nineteenth century mathematical logic: Giuseppe Peano, Alessandro Padoa, Frege, and Peirce. The paper shows that, at least in Frege and Peirce, the idea of a 'logical analysis' runs parallel to the problem of a 'notational analysis', because the determination of the simplest logic, and thus of the simplest logical signs, is inextricably connected to the problem of how to represent logic with the least amount of logical and non-logical signs, and thus with the simplest possible notation.

This special issue is the result of a workshop on logical notations held at the Tallinn University of Technology on 1–2 August 2015. We would like to thank the Faculty of Social Sciences and the Estonian Research Council for financial support for the workshop, and all the participants for stimulating contributions and discussion. Our thanks naturally also go to the contributors of this special issue, reviewers, as well as Volker Peckhaus for his support of this special issue.

### **Funding**

This work was supported by Eesti Teadusagentuur [Projects PUT 267, 'Diagrammatic Mind: Logical and Cognitive Aspects of Iconicity'; PUT 1305, 'Abduction in the Age of Fundamental Uncertainty'; PUTJD 72, 'The Philosophy of Notation. Historical and Systematic Aspects'].

### **References**

Peirce, C. S. 1885. 'On the algebra of logic: a contribution to the philosophy of notation', *American Journal of Mathematics*, 7, 180–96.