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The Dialogue between Sciences, Philosophy and Engineering. New Historical and Epistemological Insights. Homage to Gottfried W. Leibniz 1646–1716 (= *Dialogues and Games of Logic* 5)
Ed. by Raffaele Pisano, Michel Fichant, Paolo Bussotti, Agamenon R. E. Oliveira, with a foreword by Eberhard Knobloch. London: College Publications 2017. XVI, 414 pp. 20,58 £

Through seventeen papers and a foreword, twenty-two scholars from nine countries explore the interactions between science, engineering, and philosophy in G. W. Leibniz's writings and in their reception in various scientific and technological settings. The editors have opted to index alphabetically the papers according to each author's name. Though this editorial criterion could be subjected to reasonable critics in a different context, it helps in the present case to avoid any ordering which could a priori suggest the preeminence of any of the three participants in the proposed dialogue.

However, philosophy plays the role of lingua franca in the book. This is the case, for instance, with G. Hartz's criticism of what he calls "the idealist interpretation" of Leibniz's dynamics, ascribed by the author to D. Rutherford and R. M. Adams. More moderately, J. Kouneiher rejects too the idealistic interpretation of Leibniz's views on space. According to both authors, the intelligibility of Leibniz's dynamics as well as of his views on relational space would result from a non-idealistic metaphysical interpretation in which real entities replace the mind-independent beings of the idealists. A.-M. Pascal's text, although aimed at a genealogy of the "dialectic of recognition of the other" from Leibniz's *Théodicée* up to Hegel's master-slave dialectics within the limits of early modern political thought, is the most suggestive contribution of the book to philosophical thinking in general.

The predominance of philosophy is noticeable also in papers devoted to more specific scientific and engineering subjects. In this sense, the notion of "intelligibility" appears in J. Archambault's paper as the very criterion whereby Leibniz rejected Newtonian gravity. Strongly related to the notion of perfection, "intelligibility" plays too a relevant role in F. Weinert's text on heliocentrism and the relativity of motion. In both cases, the "intelligibility" criterion appears metamorphosed into other philosophical principles such as the Principle of Sufficient Reason and the Principle of Perfection, which set the framework for the dialogue between philosophy, science and engineering in Leibniz.

This is also notorious in other papers devoted to the internal analysis of Leibniz's writings. T. Tho convincingly shows that "the principle of equipollence", though "providing the means to establish invariance from variation", cannot be justified by empirical measurements as a mere extension of the Principle of Equivalence of Hypotheses. R. Pisano's and P. Bussotti's paper on Leibniz's successive explanations about planetary movements is the most extensive fulfillment of this idea in the book. They appeal to the category of "physical-structural model" in order to give a provocative

interpretation on the continuity between the *Hypothesis physica nova* and Leibniz's later views on planetary motions in terms of what the authors call "a complete theory".

The supremacy of the voice of philosophy in the proposed dialogue appears also in papers devoted to the reception of Leibniz in science and engineering. This is the case of V. Kreinovich's and G. Liu's contribution on "physical optimality" as a later interpretation of the principle of the "best possible world" in current physics. A. Drago combines E. Cassirer's assessment of Leibniz's logic as positive science with A. A. Markov's constrains on Leibniz's Principle of Sufficient Reason in order to show the inapplicability of the latter to metaphysical matters. M. Link, on his side, analyses how Leibniz's effort at incorporating relations within the tradition of substances and attributes could shed light on the problem of infinite mathematical actuality.

M. Palomo boldly suggests that science, particularly the method of the infinitesimal calculus such as used in the description of the catenary, would justify the intelligibility of Leibniz's metaphysics, not the other way around. The importance of Leibniz's scientific activities for his reception is also highlighted in A. R. E. Oliveira's paper on "Leibniz and the Engineering Sciences". The author focuses his attention mainly on calculus, binary arithmetic and the quantitative expression of living force, mv^2, the latter being celebrated as the foundational stone of applied mechanics. L. Montagnini offers a complex interpretation of Norbert Wiener's reception of Leibniz in philosophy, mathematics and cybernetics. He concludes that Wiener, though not himself a Leibnizian, was convinced of the importance of studying the ancient scientists and philosophers, particularly Leibniz. This paradoxical status of Leibniz's reception is intriguingly akin to Kurt Gödel's reception of Leibniz.

In the foreword, E. Knobloch underlines the importance of the critical editions of Leibniz's books, papers, and letters for Leibniz scholarship, particularly those still unpublished. He rightly points out the relevance of the so-called *Akademie-Ausgabe* in the case of the invention of the calculus by Leibniz, the mathematical modelling of human life, and the rigorous definition of the infinitely small. In M. Brancatto's paper, the identification of the editions of Leibniz's works available to G. Frege is more important than any historical speculation in order to satisfactorily assessing Leibniz's influence on Frege's foundation of arithmetic. "The complex editorial history of Leibniz's De quadratura arithmetica circuli ellipseos et hyperbolae" (in words of D. Crippa) plays a central role both in his analysis of Leibniz's proof that it is not possible to solve algebraically the quadrature of a sector of a circle and in G. Ferraro's contribution on Leibniz's theory of series.

The importance of E. Knobloch's advice is evident in A. Michel-Pajus's and D. Rabouin's paper. They argue that for Leibniz, "logica mathematica" is neither a general theory of abstract relations, nor a universal logical calculus, but a conceptual analysis of mathematical concepts. A decisive documentary support for their views comes from the still unpublished manuscripts collected in LH XXXV, 1, 9: "it is in the abortive attempts, the erasure and the comments on the manuscript that we find clarification of Leibniz's approach", they wrote. A wise assertion when dealing with Leibniz's writings and their reception.

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