

George Boole

Selected Manuscripts on Logic and Its Philosophy

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REVIEW

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George Boole, the founder of the algebra of logic, did not stop working on logic after having published his seminal *An Investigation of the Laws of Thought* (1854). Among his aims was to write a philosophical complement to his writings in the algebra of logic, but he died before he was able to finish it. All this was known already to his contemporaries, and although leading authorities like Augustus De Morgan, Bertrand Russell, Philip E. B. Jourdain and Louis Couturat were involved in attempts to publish Boole's posthumous logical papers, only bits and pieces from his logical manuscripts have been published up to now. This insufficient situation comes now to an end with this scholarly edition by Ivor Grattan-Guinness and Gérard Bornet. The editors have compiled a selection of about 40 % of Boole's unpublished manuscripts on logic "from a scattered and chronologically unclear textual universe" (p. xxv).

The bad condition of the manuscripts is due to Boole's working style. He usually started each time from scratch producing not really substantial texts but notes and further work-plans. This is explained by Boole himself when he reported his plans to Augustus De Morgan in March 1859 (quoted p. xxxiv):

I have written at different times as much as would make two or three books but when returning to a subject I can seldom make much use of old materials. They have lost their freshness & I can only begin again *ab novo*. And that is what I am doing—but—with a modest plan before me, having certain things to say & only desiring to say them. I

am not going to set aside anything in the Laws of Thought—
but only to interpret now within the province of pure Logic
what is done there. When this is done I shall quit for ever.

The editors organized the material in a chronological way in four parts with 17 chapters. Part A contains texts on the nature and philosophy of logic, written in the time between the publication of *The Mathematical Analysis of Logic* (1847) and the *Laws of Thought* (1854). Part B includes considerations on the philosophical interpretation of a theory of logic, written after the *Laws of Thought*. In part C the manuscripts intended for the sequel to the *Laws of Thought* are published. The concluding part D contains miscellaneous writings including some letters from the correspondences between Boole and Arthur Cayley, John William Lubbock and John Penrose. The first-mentioned correspondence presents an interesting debate in which Boole attempted to convince Cayley of his interpretations of some symbolic expressions used in *The Mathematical Analysis of Logic*.

The edited texts are accompanied by two essays contributed by the editors. In “Boole’s Quest for the Foundations of his Logic” (pp. xiii–xlvii) Ivor Grattan-Guinness gives an overall introduction to the edition, containing readable information on Boole’s life and career, the fate of his *Nachlass*, the organisation of the manuscripts. He furthermore considers the different stages of development of Boole’s logic and its place in history. In his “Boole’s Psychologism as a Reception Problem” (pp. xlvii–lviii) Gérard Bornet relates Boole’s “psychologism” to the later (especially German) discussion on “psychologism” in logic as released by Gottlob Frege’s criticism of contemporary German philosophers.

The term “psychologism” was mostly used in late 19th century philosophical disputes in order to disqualify the opponents. Almost everyone working in epistemology and logic at that time was accused of being a psychologist (for an account, see [7]). In modern logic anti-psychologism became the predominant attitude after Frege had criticized the psychological foundation of mathematics (especially in [4]) and spoken of logic as obviously having been “infected through and through by psychology” which had led to a “corrupting intrusion of psychology into logic” ([5, XIV]; English quotes according to [1, pp. 201–02]). According to Hans Pfeil ([8, p. 179]), it was Edmund Husserl who delivered, in the first volume of his *Logische Untersuchungen* (1900), the deathblow against psychologism (despite the fact that there were many post-Husserlian psychologists). Nevertheless, everyone working on the “laws of thought” was dubious, a state which led to significant

reception problems in the Frege-Russell tradition for Boole's approach to logic. Bornet quotes Russell, who thought that Boole had given the wrong title to his *Laws of Thought*: "He [Boole] was [...] mistaken in supposing that he was dealing with the laws of thought: the question how people actually think was quite irrelevant to him" ([11, p. 366]). "Yes, indeed," one could answer, because he was only interested in a normative account of the correct use of thinking, as the editors stress (pp. xxxii, xliv). If this is psychologism, Boole was a psychologist as well, of course. But one should keep in mind that Frege did not argue against this kind of psychologism. Frege argued against what has been called "substitutive psychologism" ([10, p. 314]), a position that regarded psychology as the foundational discipline of philosophy, and with this of all the sciences (*ibid.*, see also Rath's book [10] on the German dispute on psychologism).

According to Bornet's analysis, Frege's counterarguments against a psychologistic foundation of mathematics were that it robbed mathematical reasoning of "(a) its *strict truth* because it must be inductively gained, and (b) its *general validity* (in the sense of intersubjectivity) because it would, in the end, relate to subjective facts" (p. xlix). Bornet can convincingly show that both points of criticism do not affect Boole's algebra of logic, mainly due to Boole's concentration on the conception of logic as science as opposed to logic as art. On the relation between these two approaches, Boole wrote in a manuscript entitled "Elementary Treatise on Logic not Mathematical Including Philosophy of Mathematical Reasoning," from probably before 1849, the following (p. 13):

The object of Logic as a Science is to explain the laws of those mental operations by which ordinary Reasoning is conducted. The design of Logic as an Art is to exhibit the most useful general forms in which valid argument may be expressed. These objects are perfectly distinct. We might possess an exact knowledge of the ultimate laws of thought without caring to deduce from them the rules of Logic as an Art. On the other hand we might collect by observation a large number of lawful forms of argument, without possessing any acquaintance with the ultimate laws to which as their origin they may be referred.

The volume is closed by textual notes and indices of names and subjects. The edition does not only end an unbearable state in the history of logic, but gives also an excellent scholarly example of mastering and presenting manuscript sources.

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