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Arthur Thomas Shearman
The Development of Symbolic Logic: A Critical-Historical Study of the Logical Calculus
Dubuque, IA, Reprint Library, William C. Brown, 1988; and Bristol, Thoemmes Antiquarian Books, Ltd., 1990
xii + 242 pp.

REVIEW

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Were it not for these two separate facsimile reprintings of the original *The Development of Symbolic Logic* [Shearman 1906], its author would very likely be entirely forgotten today, even by the majority of historians and philosophers of logic in whose fellowship he once belonged. It is useful, and certainly instructive, to examine this book in the historical context of other histories of logic of the same era and of histories of logic of the immediately preceding and succeeding generations, so that we can examine and compare the conditions and evolution of the historiography of logic in this period and from the perspectives of the immediately preceding and succeeding generations.

Unlike historians of logic such as Carl [von] Prantl (1820-1888) of a generation earlier than his own, Shearman had—at least until his book was reprinted—largely been forgotten, along with his book. If Shearman's book has largely been ignored since its first publication, we must ask why. Is it because it offers nothing of contemporary historiographic value? or because it was insignificant at the time it was published? or because perhaps, decidedly unlike Prantl's book's still today, its viewpoint is today uncontroversial? or for some other reason? Is there any good historical or historiographical reason for reissuing this book so many years after it fell into oblivion?

Shearman's study of the history of logic differed drastically from Prantl's famous or infamous *magnum opus* of 1870. Even to this day, over a century after Prantl's death, Prantl's history is quite capable of raising the hackles of latter-day historians of logic; for example, the late Jean van Heijenoort (1912-1986) had accused Prantl of "stunning ignorance" ("*ignorance étonnante*") of the subject [Van Heijenoort 1957],

as did the late Innokent [Józéf] M. Bocheński (1902-1995) [Bocheński 1970, 7], who also asserted [Bocheński 1970, 6] that Prantl's only purpose in writing his history was to demonstrate that the philosopher Immanuel Kant (1724-1804) had been correct in claiming that formal logic had no history at all[1]. Heinrich Scholz (1884-1958), in criticizing Prantl's book, was far more tolerant in his judgment when he merely noted that Prantl, whose work chronologically covered the period from Aristotle to the end of the fifteenth century, did not have the advantage while writing his history of logic of having available "the type of formal logic" now available "in the shape of symbolic logic" [Scholz 1931, VI; 1961, vi]. While it is obvious that Prantl completed his book before much of what we today would colloquially call "mathematical logic" came into existence, it is also the case that the work of the algebraic logicians that so fundamentally contributed to the development of this mathematical logic was already well under way by this time. The mitigating circumstance is that Boole and many, though not all, of his colleagues still understood themselves at this stage to be algebraicizing traditional logic, rewriting syllogisms in a new notational system, rather than developing new logical calculi.

For his part, Scholz, who attempts to provide a history of logic from the perspective of the new symbolic logic as an alternative to the history written by Prantl without the advantage of the existence of symbolic logic to form a framework for his study, thinks that one of the potential flaws of his own book is that he himself has no historical perspective, at least insofar as he is writing his own history of logic at a time when the symbolic logic whose evolution he is tracing is possibly still in the its early stages and its history not yet fully completed, so that he does not have the advantage of hindsight, or a library of new materials of the caliber of Louis Couturat's study of Leibniz ([Couturat 1901]), on the basis of which to render informed judgments ([Scholz 1931, V; 1961,v]). In fact, Scholz (in explicit contradistinction to Prantl) expressed his confidence in the new "mathematical" logic; but there is little in his study, which loudly purports to interpret its history, to suggest that he understood it or even knew much about it. Scholz's discussion raises the historiographical question of the possibility of writing a history of a field while that field is, or is perceived to be, still in a state of flux, or development. Scholz wrote his history in 1931; Shearman's book first appeared in print in 1906. Shearman's book suggests, in a way that

[1]Charles Sanders Peirce (1839-1914) was among the best, if not *the* best, informed historians of medieval logic of the nineteenth century. Yet he too also judged that, despite the great respect that the medieval schoolmen had for logic, "[p]urely formal syllogistic made no progress worth mentioning" [Peirce 1931, 1:29-33, 1:567]

Scholz's does not, that an historical depiction of a field in the midst of the flowering of that field can yield good history. Moreover, it provides a contemporary profile of the field, as viewed at a specific state of development (and in this particular case, at a pivotal, even formative, moment). Shearman's history, although completed a generation before Scholz's, gives a perspective on the history of mathematical logic that is closer to the one we see today, albeit with obviously greater hindsight than Shearman could possibly have had in 1906, whereas Scholz's today appears quaint and old-fashioned, an attempt to superficially impose the values of the 1920s and early 1930s upon the work of logicians of previous generations and previous eras, to interpret Aristotle and Leibniz, as it were, from the perspectives of the Vienna Circle. The *Short History of Logic* by Robert Adamson (1852-1902) [Adamson 1911], who is remembered primarily, if at all, for his positive reviews of Schröder's *Der Operationskreise des Logikkalkuls* [Adamson 1878] and of Jevons's *Studies in Deductive Logic* [Adamson 1881], is temporally much closer to Shearman's book than to Scholz's, but it is closer in spirit to Scholz's, or even to Prantl's, than to Shearman's. And the culmination of the history of logic, as perceived in Adamson's book—admittedly not completed by him, but edited and published by the moral philosopher and historian of philosophy William Ritchie Sorley (1855-1935)—is found in the psychological logicians of the Victorian-Bismarckian-Edwardian era, of Rudolf Hermann Lotze (1817-1881) in Germany and Francis Herbert Bradley (1846-1924) in England; in Adamson's book, the algebraicists, whose work forms the contentual core of Shearman's history, are barely mentioned. Adamson's own philosophical leanings were with Kant and the neo-Hegelian philosophers, and Sorley had also been influenced by Lotze and the British neo-Hegelians.

Arthur Thomas Shearman was born in Wrangle, Lincolnshire, England in 1866. He died in 1937. He received his secondary education at a school in Bath, England, after which he attended University College of Wales in Aberystwyth, and then University College, London, earning an M.A. and a D. Litt. From 1908 to 1911 he worked at the Institute of France on an international edition of Leibniz, and from 1911 to 1915 he served at the University of London as an Examiner in Logic. The courses which he taught included "Advanced Logic" and "History of Psychology". In addition to *The Development of Symbolic Logic*, his published books were *The Scope of Formal Logic: The New Logical Doctrines Expounded, with Some Criticisms* [Shearman 1911], which was an exposition and defense of the symbolic logic devised by Frege, Peano, and Russell, and—according to one anonymous source—*The*

Essence of Logic[2], he published as well several journal articles in philosophy of logic, *e.g.* on "Definition in Symbolic Logic" [Shearman 1910], and in particular on questions relating to existential import of propositions (*e.g.* [Shearman 1905a] and [Shearman 1906a]), and a review of Russell's *The Principles of Mathematics* [Shearman 1907]. The two major influences on Shearman were John Venn, with whom Shearman often directly discussed matters of logic and history of logic, and William Ernest Johnson (1858-1931), a Cambridge logician, author of the series of articles "The Logical Calculus" [Johnson 1892] presenting an exposition of formal logic, including traditional formal logic and symbolic logic, and the logic of relatives, and a logic textbook [Johnson 1921-24], who through his publications and his correspondence with Shearman helped Shearman clarify some of his own ideas —and whose "infernal niggling criticism" prompted Whitehead to prepare a note for the second edition of the *Principia Mathematica* on the various meanings of "function" (see Whitehead's letter to Russell, 24 May 1923 as quoted by [Lowe 1990, 276]).

Shearman's *The Development of Symbolic Logic* is in its scope and purpose a clear forerunner of Clarence Irving Lewis's much better known tome *A Survey of Symbolic Logic: The Classic Algebra of Logic, Outline of Its History, Its Content, Interpretations and Applications, and Relation of It to Late Developments in Symbolic Logic* [Lewis 1918], although Shearman's book certainly does not develop and expound in the exacting details the technicalities of the Boole-Schröder calculus that are to be found in Lewis's *Survey*, and the advantage goes to Lewis's book also in its timing, appearing just after, rather than just before, the appearance of the *Principia Mathematica*, when the direction of the new "symbolic logic" was already much more clear and pronounced. (An interesting sidelight: in his autobiography, [Lewis 1968, 13] recalled that shortly after arriving at the University of California in Berkeley in the autumn of 1911, he wished to teach a course in symbolic logic, or "advanced logic" as it was then called, but that there were no textbooks available, that the only books available were Couturat's [Couturat 1905] *L'algèbre de la logique*, not yet translated into English (as [Couturat 1914]) and "an even slighter book by A. T. Shearman." Lewis, very regrettably, did not, however, specify whether this was Shearman's *The Development of Symbolic Logic* [1906], *The Scope of Formal Logic* [1911], or the elusive *Essence of Logic*. But he

[2]This work has so far completely eluded me, and I have thus far found no bibliographical information; nor is it listed either in [Church 1984] or in [Risse 1973].

did say that this absence of suitable textbooks prompted him to write his *Survey*.)

In Shearman's *The Development of Symbolic Logic*, readers are provided with a portrait of the state of logical knowledge during the years immediately after publication of Russell's *The Principles of Mathematics* and immediately prior to publication of Whitehead and Russell's *Principia Mathematica*, and of the philosophical issues that were central to the current discussions among contemporary logicians and philosophers, questions such as the nature of logic—whether logic should be viewed as a calculus of propositions or a calculus of terms, or whether the same technical apparatus could be used independently of whether the calculus dealt with terms or propositions, and the question of the existential import of propositions. A virtual prospectus of the *Development* appeared under the title "Some Controverted Points in Symbolic Logic" in the *Proceedings of the Aristotelian Society* [Shearman 1905]. This paper was at the same time a conspectus of the salient critical and historical points made in the *Development*. Shearman's book combines the author's philosophical views on the contemporary philosophical issues of logic with a conceptual account of the history of logic in the five decades from Boole's *The Laws of Thought* to Bertrand Russell's in *The Principles of Mathematics*. Shearman's purpose is to make sense of the various and competing logical systems that were developed in the last half of the nineteenth century and first few years of the twentieth. That is, he aimed to display for his readers what the common points were of the various systems and to show how, despite variations in style and philosophical underpinnings, what was developed from Boole to Russell was a single logical calculus. The differences among the competing systems of logic that Shearman considered were, he thought, largely the result of the fact that each major researcher began work anew, so to speak "from scratch" and on his own, that is, without reference, and sometimes even without knowledge, of the work of those who had gone before. Thus, for example, anyone surveying the field was forced to deal with a multiplicity even of notations.[3]

[3]We may note in support of Shearman's contention that throughout much of the second half of the nineteenth century, logicians from Peirce to Peano and as widely differing as Schröder and Venn commented upon and were concerned with evaluating, comparing, and contrasting the various competing systems and their respective notations. Schröder, for example, was one of those who made the question of "pasigraphy" and its distinction from a logical system as a calculus a central theme of some of his writings, *e.g.* [Schröder 1892, Schröder 1898, Schröder 1898-99], while Venn [Venn 1880, 38], thought it necessary and worthwhile to provide a survey and comparison of the various types of systems and notations currently being used; and that both Schröder ([Schröder 1880]) and Venn ([Venn 1880a]), for example, in their

In opposition to the view that there are "various symbolic systems" that are "radically distinct" and are "competing with one another for general acceptance," Shearman adopts the view, instilled in him by Johnson in correspondence dating from 1903, that "there is available at the present time what may be called *the* Logical Calculus, and towards the creation of this Calculus most symbolists have contributed" (p. v). The variety that researchers detected was, Shearman argued, one of style and philosophical underpinning, rather than of technical substance. *The Development of Symbolic Logic* is Shearman's exposition and commentary upon the creation and evolution of that calculus, from Boole to Russell. In the course of this evolution, Shearman traces how the calculus has expanded and become increasingly sophisticated and powerful, and thus capable of dealing at each step with a "vastly wider range of problems" (p. vi) than could possibly have been dealt with by Boole.

The discussion of the apparent existence of "various symbolic systems" and of correspondingly differing systems of notation led Shearman to the important point—one that is assuredly brought home to historians of logic and one worthwhile inculcating by historians of logic into those of their ahistorical colleagues intent only on devising and proving new theorems—that knowledge of the history of logic is valuable to researchers in logic. He writes (pp. 23-24):

> The reason that such variety exists is, I think it must be said, that symbolists have frequently not been sufficiently acquainted with the writings of their predecessors. . . . This want of historical information on the part of symbolists, besides causing students unnecessary difficulties, has resulted in a good deal of wasted effort, for each logician instead of starting where his predecessor left off, has had to work out all the elementary notions of the subject for himself.

Although Shearman readily admitted that Boole had forerunners, in particular Johann Heinrich Lambert (1728-1777), Gottfried Ploucquet (1716-1790), and Georg Jonathan von Holland, who in their turn had been influenced by Leibniz and Christian [von] Wolff (1679-1754), he excludes them from his history on the grounds that (1) none of them

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respective first published reactions to Frege's *Begriffsschrift*, suggested that Frege was either purposefully neglectful or blissfully unaware of the work of Boole and his successors. Sophie Bryant [Bryant 1888, 188] was among those who complained about the "heterogeneity of result" and "increasing variety of symbolic procedure" in the logic of the day.

"framed any generalisations" (p. 5), and especially (2) since Boole was neither acquainted with nor influenced by their ideas. Thus, Shearman looked to Boole as the researcher "to whom we are indebted for having first constructed a logical calculus," albeit a very complicated one and one in which a number of processes that are central to symbolic logic were absent (p. 5). The principal researchers that Shearman singles out (p. 6) as contributing the most to the development of symbolic logic after Boole are: John Venn (1834-1923), Ernst Schröder (1841-1902), John Neville Keynes (1852- 1949), author of the article "On the Position of Formal Logic" [1879] and the popular textbook *Studies and Exercises in Formal Logic* [1884], William E. Johnson, Oscar Howard Mitchell (1851-1889), Christine Ladd-Franklin (1847-1930), and Charles S. Peirce (1839-1914). (It is unclear whether the order of Shearman's list was intended to be anti- or a-chronological or an indication of the relative importance which Shearman assigned to these logicians. It is clear throughout the book, however, that Shearman takes Venn as his principal authority on the history of logic.) In examining the contributions of these logicians, Shearman's methodology is first to consider a set of premises and examine how to derive a certain conclusion from them; and second, to consider a given conclusion and then attempt to determine what set of premises would be required in order to obtain that conclusion. On the basis of this test, Shearman determines whose procedures are best capable of solving the problem. In the case of the procedures of the "analytic method" of starting from a set of premises deriving a conclusion from them, Shearman found that Schröder's procedures were an advance over Boole's, and that Keynes's, "which in many respects resembles Schröder's, are neatness itself" (p. 69). In regard to the diagrammatic method, Shearman found Marquand's to be more "serviceable" than Venn's or Keynes's. In regard to the inverse method, of starting with a conclusion and determining which set of premises are required for its proof, Shearman notes that Boole does not provide for this technique, and that Johnson's simplification of Keynes's procedure has "practically settled this matter" (p. 89). (It should be noted here that Platon Sergeevich Poretskii's (1846-1907) inverse method developed in his [1884] paper "On Methods of Solution of Logical Equations and the Inverse Method of Mathematical Logic", is not considered by Shearman, possibly because he did not have access to or knowledge of this work of Poretskii, which, unlike many of Poretskii's papers, published in French, appeared in Russian.)

After outlining the development of logic through this line from Boole up to his own day, Shearman turns to the question of whether the best means of elaborating the calculus is through an intensive or extensive

interpretation of propositions, and he concludes that those who opted for the extensive interpretation had made the superior choice; he then turns to the work of Jevons and of MacColl, both of whom took the extensional route, but both of whom, in Shearman's judgment, committed serious errors. To treat this topic, Shearman deals with what he called "manipulation of propositions with single quantifications" (p. 7), that is, with what we would today call propositional logic. He next considers quantificational logic, or what he calls "the case of double and multiple quantifications" (p. 7), which leads to a discussion of the logic of relations, and it is shown that whereas it is possible to apply and extend the inference rules of propositional logic to quantification theory, the copula cannot be treated in a "general" manner. This leads finally to a discussion of the contributions of Frege, Peano, and Russell, who have shown, as he writes (p. 8) that when "certain distinctions" are made which the older symbolists sloughed off as "unimportant" and suitable interpretations are provided for concepts of quantitative mathematics, "both the comprehensiveness and the utility of Symbolic Logic are greatly increased."

If we compare Shearman's history with contemporaneous histories such as Adamson's, or (extending the sense of contemporaneity) to Prantl's and Scholz's, we are led to conclude that Shearman's was by far the most perspicacious and comprehensive of the period 1855-1915 of those considered, although in hindsight we would indubitably give significantly less attention today to the contributions of such of Shearman's contemporaries as Johnson, Keynes or Sophie Bryant (1850-1922). And whereas some historians of logic of the generations practicing during the period from the 1910s-1980s, such, for example as van Heijenoort, would give fairly short shrift to the contributions of the generations of algebraic logicians from Boole to Schröder to the concomitant profit of Frege, Peano, and Russell, Shearman's conception of the history of mathematical logic comes closest to the one we today find closer to the historiographical truth—namely that the work of the "symbolists" from Boole to Schröder and their colleagues and students and then of Frege, Peano, and Russell form together a growing edifice that, with trial and error and variations, but essential unity, was built up into the subject of Symbolic Logic that appeared in Russell's *Principles*. In his review of the Thoemmes reprint of Shearman's book, Randall Dipert [Dipert 1992, 1486] notes that Shearman's view that the "newer" work, just emerging, of Frege, Peano, and Russell, "as a useful and complementary addition to older researches", seems "[s]omewhat remarkable to us in hindsight."

Dipert also thinks he detects some hints of latent British chauvinism in Shearman's history, "or at least pride about the achievements of pre-Russellian English logic that are not now widely accepted" [Dipert 1992, 1486]. In the sense that Shearman was looking in isolation at the work in logic of Boole, De Morgan, Hamilton, Schröder, Venn, *et alium*, without reference to their broader mathematical background, without noting or attempting to note the roots, for example, of Boole's work in algebra of logic, without examining the influences of the symbolical algebra of George Peacock (1791-1858) and members of the "Analytical Society", of the nascent origins of relational algebra in Ploucquet and his early-nineteenth-century successor Christian August Semler in *Versuch über die combinatorische Methode* [Semler 1811], or of Hermann Grassmann's *Ausdehnungslehre*, and Benjamin Peirce's work in linear algebra, not to mention Boole's own work in the algebraic treatment of the differential calculus as a continuation of the work of symbolical algebra, Dipert's assertion is quite fair. Shearman takes logic in a rather narrow—one might, with many strong reservations and qualifications almost say "pre-Boolean", *if* by "pre-Boolean" here is merely meant "traditional" or "Aristotelian"—sense, in which formal logic, as Dipert [Dipert 1992, 1486] expresses it, is discussed "without ever quite displaying" the symbolical forms. Shearman clearly does not readily detect the connection of the developments of the nineteenth-century in mathematical logic with the work in linear and multilinear algebra towards the development of abstract algebra, nor of function-theoretic semantics for logical systems at the turn of the century in the work on real analysis from Cauchy to Weierstrass and the work in set theory of Cantor and Dedekind. Rather, he only narrowly sees the potential for the application of the developments in logic of Frege, Peano, and Russell to the broader field of mathematics. To say, as Dipert [Dipert 1992, 1487] does, however, that symbolic logic in Britain might have pursued a different course without Russell and without the influences of Continental European logicians that Russell's work helped to introduce to British logicians, is sheer speculation and poses a probably unanswerable historiographical problem. At best, we can surmise that Shearman in his book reflected not only the vision of the history of mathematical logic as it was understood by contemporaries, *circa* 1905, but also the vision of the nature of mathematical logic as it was understood by contemporaries, *circa* 1905. If this is indeed the case, then it is precisely the photographic portrait of logic and its history *circa* 1905 provided by Shearman's book that renders it an invaluable historiographical, if not an invaluable historical, document.

In summary: Shearman saw the history of symbolic logic from Boole to Russell as the evolving refinement, improvement, expansion, sharpening, strengthening, and consolidation of the logical calculus created by Boole, and saw the "different" systems developed by Boole and those who came after not as competing systems but as idiosyncratic variants or guises contributing to the development of a single, unified logical calculus. In this, his historical perspective was akin to that of many of his foremost contemporaries, including such researchers as Peano, who viewed their contributions and those of their colleagues, such as Russell, as a continuation and elaboration (perhaps, however, from differing angles) in the development of a single line of research and a single enterprise withal, originating with Boole (and inspired by Leibniz). From this standpoint, and in particular as expressed in the present instance by Shearman, if researchers such as Frege thought that they were beginning anew and creating a new endeavor, it was because they were in fact working in isolation from, or in ignorance of, the work of other researchers in logic. From this standpoint likewise the allegedly sharp break which Russell described between his work and that of Frege and Peano on the one hand and that of the Boole-Schröder tradition on the other, a distinction which was later to become the canonical interpretation of the history of modern logic as codified by historians of logic such as van Heijenoort between the algebraic logicians on the one hand and the quantification-theorists on the other, between *logica utens* and *logica magna* (see, *e.g.* [Van Heijenoort 1986], esp. p. 80) was invisible, even nonexistent, in the view of Shearman and many of his contemporaries. Louis Couturat, for example, summarized the development of that history by the view that the algebra of logic "ought ... to develop into a logic of relations, which LEIBNIZ foresaw, which PEIRCE and SCHRÖDER founded, and which PEANO and RUSSELL seem to have established on definite foundations" [Couturat 1914, 92]. Similarly, Philip Jourdain [1910-13] undertook to provide an exposition of "The Development of Theories of Mathematical Logic and the Principles of Mathematics" that sought to present the history of mathematical logic as a unified progression from Boole to Russell. And Peano himself placed his own work squarely within the historical tradition from Boole to Schröder, referring to the work of Boole, Peirce, Jevons, MacColl, and Schröder as the starting point of his own research (see, *e.g.* [Peano 1889; 1973, 102, n. 1]). Peano went so far as to explain to Russell in a letter of 19 March 1901 (as quoted by [Kennedy 1975, 206]) that Russell's work on the logic of relations "fills a gap between the work of Peirce and Schröder on the one hand and

the *Formulaire* on the other". For Shearman (and the majority of his contemporaries), that is, the "logistic" of Frege, Peano, and Russell was just the newest, current, stage of the symbolic logic that had originated with Boole. Shearman does not go into as great a detail in discussing the work of the later mathematicians, but he essentially agreed with Jourdain when the latter wrote [Jourdain 1910-13, 271], for example, that whereas Peano took Schröder's work as his own starting point, his subsequent work on propositions "contained considerations which were a distinct advance upon those of Schröder; and here we see the beginnings of those reforms in mathematical logic by which Peano made it capable of expressing all mathematical propositions."

Shearman's book is a most valuable historiographical item. It represents the best of historiographical research in the period when logic was just attaining its current shape and status, encompasses and unifies the period of the "youthful" algebraic stage of mathematical logic, from Boole to Schröder, and the "adolescent" function-theoretic stage of from Frege to Russell while bridging these two sometimes seemingly distinct and crucial periods in the history of logic, and it not only presents a snapshot of the shape and status of mathematical logic at the doorstep of the *Principia Mathematica* when the familiar "logisitic" emerges that we today call mathematical logic, but also is itself an important artifact from that period in the history of logic. And it carries within it an important message (and certainly a message both emotionally and intellectually satisfying to historians of logic) from historians of logic to those research logicians who may, to their ultimate peril, ignore the history of logic.

Neither of the two reprints is supplemented by any external apparatus, such as editorial notes, commentary, or an introduction that might have enhanced the scholarly value of the reprints by providing information on Shearman or his book, on the history of the original edition of his book, or on the historical context in which it appeared, or an assessment of its appraisal, if any, by Shearman's colleagues and contemporaries, and which by providing such an apparatus, could contribute to our understanding or appreciation of this book and its rôle and that of its author in the history and historiography of logic.

As a matter of fact, I have been able to locate only three reviews of the original edition of Shearman's book (although there is presumed to be at least a fourth). One is in a mathematical journal and is unfavorable; two others (and the presumed fourth review) are in philosophical journals and of these, two are favorable. The anonymous and

exceedingly brief review, being anonymous, does not readily lend itself to serious evaluation or consideration, although it appeared in the Supplément to the respected French philosophy journal *Revue de métaphysique et de morale* [Anonymous 1906]. We might wish to speculate that the author of the anonymous review was H. Dumfier, on the sole ground that Dumfier also penned a signed review of Shearman's *The Scope of Formal Logic* [Dumfier 1914]; but this evidence is, of course, rather slim at best.

One of the two reviews that I have been able to locate is the triple review by Harvard University's applied mathematician, economist and chemist Edwin Bidwell Wilson (1879-1964) of Shearman's book, along with Couturat's *L'Algèbre de la logique* and MacColl's *Symbolic Logic and Its Applications* [Wilson 1907-8]. Wilson's treatment of Shearman's book [Wilson 1907-8, 187-191], in comparison to his treatment of the books of Couturat and MacColl, was largely negative. He thought that Shearman focused his attention primarily and too exclusively on the early work in logic, from Boole to MacColl, and did not give enough attention to Frege and Peano. Unlike Shearman, Wilson did not see the work of Frege, Peano, and Russell as a continuation of the work of the Boole-Schröder tradition and of MacColl; rather, he thought [Wilson 1907-8, 177] that "Frege and Peano came forward with essentially new ideas" in logic. He also argued that Shearman made no clear distinction between historical exposition and criticism, and that Shearman's book would be of much more interest to logicians than to mathematicians, but not of so much interest to the symbolic logicians, and he asserted that a better and more useful treatment of symbolic logic than was provided in Shearman's book could be found in Edward V. Huntington and Christine Ladd-Franklin's *Encyclopedia Americana* article [Huntington & Ladd-Franklin 1905].

The reviewer in *The Philosophical Review* of 1906 (according to the quotation in an advertisement printed by Thoemmes for their reprint edition[4]), on the contrary, held Shearman's book to be "clear and illuminating" and thought that it serves as "an excellent orientation" in symbolic logic.

Sociologist and philosopher Walter T. Martin of Princeton University, after summarizing Shearman's book chapter by chapter, declared

[4]I have been unable to readily access the review in *The Philosophical Review*, and the name of the author of the review and the precise location are not given. The same advertisement also erroneously gives 1908 as the year that the review appeared in *The Journal of Philosophy*, and likewise fails to name the author or the precise location of the review.

that it is too advanced for beginners because it "presupposes considerable acquaintance with the work of the symbolists, in fact, of all the authors whose work is discussed," but that it is "especially valuable at a time, such as the present, when there is a great need of taking account of stock of what has been done in symbolic logic, and that in a way that could not have been done in giving us one more textbook or treatise" [Martin 1907, 497]. In contradistinction to Wilson, then, who found the textbooks of Couturat and MacColl of greater value to locians than Shearman's when the purpose was to apprise readers of the then-present state of knowledge of the field, Martin thought that Shearman's book added a dimension to the study of logic that was absent from the textbooks of the day, by providing an analysis and survey of the entire field at a time when it was undergoing rapid development and change, rather than merely providing one more exposition of algebraic logic or one more presentation of its author's logical system.

The late John Arthur Passmore (1914-2004) did not review Shearman's *Development* [Passmore 1957, 122n.], but in a footnote introducing the chapter on logic in his book on history of late nineteenth-early twentieth century philosophy, he recommended it to his readers alongside of, and apparently on a par with, such other major works on the history of logic as Jourdain's [1910-13] "The Development of Theories of Mathematical Logic and the Principles of Mathematics", Joergen Joergensen's [1931] *A Treatise of Symbolic Logic*, a later edition of Louis Liard's *Les Logiciens Anglais Contemporains* [Liard 1907], and C. I. Lewis's [1918] *A Survey of Symbolic Logic*, adding to this list William and Martha Kneale's *The Development of Logic* [Kneale & Kneale 1962] in the second edition of his history [Passmore 1966, 122n.].

Shearman's book *The Scope of Formal Logic* was something of a "follow-up" to *The Development of Symbolic Logic* in that it presented an exposition and defense of the new symbolic logic against the traditional logic of Aristotle as modified by the Stoics. The British historian of philosophy Alfred Edward Taylor (1869-1945) (whose primary area of expertise was ancient Greek philosophy, especially Plato) in his review of Shearman's book *The Scope of Formal Logic* [Taylor 1912], asserted that it was worthwhile primarily for the level of exposition and the presentation to the extent that it led the reader to wish to study the subject further; but he also asserted that Shearman's book was marred by what he thought were grave misunderstandings of the ideas of Frege, Peano, and Russell, and he suggested that Shearman did not read these authors' writings. Taylor was willing to give Shearman the benefit of the doubt on this score *only* in the case of *Principia*

Mathematica, which appeared too late to be of use to Shearman when writing *The Scope of Formal Logic*.

If no more had been written on Shearman's books than these four reviews (and in particular the three reviews of *The Development of Symbolic Logic*), it could be a matter of historiographical and historical interest to know that that was the case, and an historiographical problematic to ask and attempt to answer the question 'Why?'. Moreover, it could be interesting and important to know whether the complete publication statistics for the review are borne out by the ratio of philosophy to mathematics journals that we have thus far discovered, and to attempt to ascertain whether or not all of the mathematical reviews were generally unfavorable while all of the philosophical reviews were generally favorable, and if so, to ask why. The larger questions must be whether Shearman's book indeed served as a kind of orientation to and assessment of the field of symbolic logic in the middle and second half of the first decade of the twentieth century, and what influence, if any, it had on those who took up the field; and whether or not the reason that it slipped so quickly and easily into obscurity, apparently almost as soon as it was published, was because events overtook it, events such as the appearance almost as soon as the ink was dry on the few reviews which it spawned, of the first volume of Whitehead and Russell's *Principia Mathematica*. Wilson [Wilson 1907-8, 174-175] offered another plausible explanation for the neglect that he assayed, if not of Shearman's book specifically, then of symbolic logic generally in the first decade of the twentieth century, finding that symbolic logic at that time was "in the interesting though somewhat precarious state of being little known, less used, and much scorned" by both mathematicians and philosophers alike, even while "it has its own ardent supporters whose proselytism is at times almost as fanatical and extravagant as it is unavailing." This appraisal immediately raises the question as to whether Wilson's perception of the "precarious state" of symbolic logic in the middle years of the first decade of the twentieth century is really accurate and whether it was shared by his colleagues; and if the answer to either of these questions is affirmative, then, why that would indeed have been the case (a question asked, almost rhetorically, by Thony Christie [Christie 1990, 22]). Is there anything in Shearman's book itself that might supply the answers to any of these questions? Regrettably, no. The reprintings of Shearman's book, without editorial apparatus or commentary, without discussion of the context in which the book appeared or of the historical framework for the book, leave these questions open and provide, as Christie [Christie 1990, 25] insinuated, the need to pursue a social history of logic of this period.

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