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# From Frege To Godel A Source Book In Mathematical Logic 1879 1931 Source Books In History Of Sciences

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## JAZMIN JACKSON

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*From Frege to Gödel* Harvard University Press  
 George Boolos was one of the most prominent and influential  
 logician-philosophers of recent times. This collection, nearly all  
 chosen by Boolos himself shortly before his death, includes thirty  
 papers on set theory, second-order logic, and plural quantifiers;  
 on Frege, Dedekind, Cantor, and Russell; and on miscellaneous  
 topics in logic and proof theory, including three papers on various  
 aspects of the Gödel theorems. Boolos is universally recognized  
 as the leader in the renewed interest in studies of Frege's work  
 on logic and the philosophy of mathematics. John Burgess has  
 provided introductions to each of the three parts of the volume,  
 and also an afterword on Boolos's technical work in provability  
 logic, which is beyond the scope of this volume.  
*Quantification: Transcending Beyond Frege's Boundaries* W. W.

Norton & Company

The fundamental texts of the great classical period in modern  
 logic, some of them never before available in English translation,  
 are here gathered together for the first time. Modern logic,  
 heralded by Leibniz, may be said to have been initiated by Boole,  
 De Morgan, and Jevons, but it was the publication in 1879 of  
 Gottlob Frege's *Begriffsschrift* that opened a great epoch in the  
 history of logic by presenting, in full-fledged form, the  
 propositional calculus and quantification theory. Frege's book,  
 translated in its entirety, begins the present volume. The  
 emergence of two new fields, set theory and foundations of  
 mathematics, on the borders of logic, mathematics, and  
 philosophy, is depicted by the texts that follow. Peano and  
 Dedekind illustrate the trend that led to *Principia Mathematica*.  
 Burali-Forti, Cantor, Russell, Richard, and König mark the  
 appearance of the modern paradoxes. Hilbert, Russell, and  
 Zermelo show various ways of overcoming these paradoxes and  
 initiate, respectively, proof theory, the theory of types, and

axiomatic set theory. Skolem generalizes Löwenheim's theorem, and he and Fraenkel amend Zermelo's axiomatization of set theory, while von Neumann offers a somewhat different system. The controversy between Hubert and Brouwer during the twenties is presented in papers of theirs and in others by Weyl, Bernays, Ackermann, and Kolmogorov. The volume concludes with papers by Herbrand and by Gödel, including the latter's famous incompleteness paper. Of the forty-five contributions here collected all but five are presented in extenso. Those not originally written in English have been translated with exemplary care and exactness; the translators are themselves mathematical logicians as well as skilled interpreters of sometimes obscure texts. Each paper is introduced by a note that sets it in perspective, explains its importance, and points out difficulties in interpretation. Editorial comments and footnotes are interpolated where needed, and an extensive bibliography is included.

**Gödel's Theorem in Focus** Cambridge University Press

Berto's highly readable and lucid guide introduces students and the interested reader to Gödel's celebrated Incompleteness Theorem, and discusses some of the most famous - and infamous - claims arising from Gödel's arguments. Offers a clear understanding of this difficult subject by presenting each of the key steps of the Theorem in separate chapters Discusses interpretations of the Theorem made by celebrated contemporary thinkers Sheds light on the wider extra-mathematical and philosophical implications of Gödel's theories Written in an accessible, non-technical style

**From Frege to Gödel** Cengage Learning

Most areas of philosopher Edmund Husserl's thought have been explored, but his views on logic, mathematics, and semantics have been largely ignored. These essays offer an alternative to discussions of the philosophy of contemporary mathematics. The book covers areas of disagreement between Husserl and Gottlob Frege, the father of analytical philosophy, and explores new perspectives seen in their work.

**Frege's lectures on logic** Springer Science & Business Media  
"A gem...An unforgettable account of one of the great moments in the history of human thought." —Steven Pinker Probing the life and work of Kurt Gödel, Incompleteness indelibly portrays the tortured genius whose vision rocked the stability of mathematical reasoning—and brought him to the edge of madness.

**From Frege to Gödel** Harvard University Press

This volume contains English translations of Gödel's chapters on logicism and the antinomies and on the calculi of pure logic, as well as outlines for a chapter on metamathematics. It also comprises most of his reading notes. This book is a testimony to Gödel's understanding of the situation of foundational research in mathematics after his great discovery, the incompleteness theorem of 1931. It is also a source for his views on his logical predecessors, from Leibniz, Frege, and Russell to his own times. Gödel's "own book on foundations," as he called it, is essential reading for logicians and philosophers interested in foundations. Furthermore, it opens a new chapter to the life and achievement of one of the icons of 20th century science and philosophy.

**The Search for Mathematical Roots, 1870-1940** Springer Science & Business Media

This brief text assists students in understanding Gödel's philosophy and thinking so that they can more fully engage in useful, intelligent class dialogue and improve their understanding of course content. Part of the "Wadsworth Philosophers Series," (which will eventually consist of approximately 100 titles, each focusing on a single "thinker" from ancient times to the present), ON GÖDEL is written by a philosopher deeply versed in the philosophy of this key thinker. Like other books in the series, this concise book offers sufficient insight into the thinking of a notable

philosopher better enabling students to engage in the reading and to discuss the material in class and on paper."

**Logicism, Intuitionism, and Formalism** Springer Science & Business Media

In case you are considering to adopt this book for courses with over 50 students, please contact ties.nijssen@springer.com for more information. This introduction to mathematical logic starts with propositional calculus and first-order logic. Topics covered include syntax, semantics, soundness, completeness, independence, normal forms, vertical paths through negation normal formulas, compactness, Smullyan's Unifying Principle, natural deduction, cut-elimination, semantic tableaux, Skolemization, Herbrand's Theorem, unification, duality, interpolation, and definability. The last three chapters of the book provide an introduction to type theory (higher-order logic). It is shown how various mathematical concepts can be formalized in this very expressive formal language. This expressive notation facilitates proofs of the classical incompleteness and undecidability theorems which are very elegant and easy to understand. The discussion of semantics makes clear the important distinction between standard and nonstandard models which is so important in understanding puzzling phenomena such as the incompleteness theorems and Skolem's Paradox about countable models of set theory. Some of the numerous exercises require giving formal proofs. A computer program called ETPS which is available from the web facilitates doing and checking such exercises. Audience: This volume will be of interest to mathematicians, computer scientists, and philosophers in universities, as well as to computer scientists in industry who wish to use higher-order logic for hardware and software specification and verification.

**Interpreting Gödel** Springer Nature

In his attempt to give an answer to the question of what constitutes real knowledge, Kant steers a middle course between empiricism and rationalism. True knowledge refers to a given empirical reality, but true knowledge has to be understood as necessary as well, and so consequently, must be a priori. Both demands can only be reconciled if synthetic a priori judgments are possible. To ground this possibility, Kant develops his transcendental logic. In Frege's program of providing a logicistic basis for true knowledge the same problem is at issue: his logicist solution places the quantifier into the position of the basic element connected to the truth of a proposition. As the basic element of a theory of logic, it refers at the same time to something in reality. Mołczanow argues that Frege's program fails because it does not pay sufficient attention to Kant's transcendental logic. Frege interprets synthetic a priori judgments as ultimately analytic, and thus falls back onto a Leibnizian rationalism, thereby ignoring Kant's middle course. Under the title of the transcendental analytic of quantification Mołczanow discusses Frege's concept of quantification. For Frege, the proper analysis of number words and the categories of quantity raises problems which can only be solved, according to Mołczanow, with the help of Kant's transcendental logic. Mołczanow's book thus deserves its places in the series Critical Studies in German Idealism because it provides a further elaboration of Kant's transcendental logic by bringing it into conversation with contemporary logic. The result is a new conception of the nature of quantification which speaks to our time.

**Frege and Gödel** Cambridge University Press

This volume commemorates the life, work and foundational views of Kurt Gödel (1906–78), most famous for his hallmark works on the completeness of first-order logic, the incompleteness of number theory, and the consistency - with the other widely

accepted axioms of set theory - of the axiom of choice and of the generalized continuum hypothesis. It explores current research, advances and ideas for future directions not only in the foundations of mathematics and logic, but also in the fields of computer science, artificial intelligence, physics, cosmology, philosophy, theology and the history of science. The discussion is supplemented by personal reflections from several scholars who knew Gödel personally, providing some interesting insights into his life. By putting his ideas and life's work into the context of current thinking and perceptions, this book will extend the impact of Gödel's fundamental work in mathematics, logic, philosophy and other disciplines for future generations of researchers.

**Husserl Or Frege?** Open Court Publishing

"By looking at Frege's lectures on logic through the eyes of the young Carnap, this book casts new light on the history of logic and analytic philosophy. As two introductory essays by Gottfried Gabriel and by Erich H. Reck and Steve Awodey explain, Carnap's notes allow us to better understand Frege's deep influence on Carnap and analytic philosophy, as well as the broader philosophical matrix from which both continental and analytic styles of thought emerged in the 20th century."--BOOK JACKET.

*From Frege to Gödel. A source book in mathematical logic, 1879-1931* ed. by BRILL

This anthology reviews the programmes in the foundations of mathematics from the classical period and assesses their possible relevance for contemporary philosophy of mathematics. A special section is concerned with constructive mathematics. *Chapters from Gödel's Unfinished Book on Foundational Research in Mathematics* Princeton University Press

This volume, a shortened edition of Mr. van Heijenoort's internationally acclaimed *From Frege to Gödel: A Source Book in Mathematical Logic, 1879-1931* (HUP 1967), makes available in English the two most important works in the growth of modern mathematical logic. Heralded by Leibniz, modern logic had its beginnings in the work of Boole, DeMorgan, and Jevons, but the 1879 publication of Gottlob Frege's *Begriffsschrift* opened a great epoch in the history of logic with the full-form presentation of the propositional calculus and quantification theory. Frege and Gödel: *Two Fundamental Texts in Mathematical Logic* begins with this short book, which ushered in the classical age of mathematical logic by outlining the construction of a system of logical symbolism. The volume concludes with Gödel's famous incompleteness paper of 1931, which changed the development of logic and the foundations of mathematics by revealing the intrinsic limitations of formal systems, and brought to an end the classical phase. Mr. van Heijenoort has provided a new introduction which sets the Frege and Gödel pieces in perspective in the development of modern logic and points out difficulties in interpretation. Editorial comments, footnotes, and bibliographic information offer additional explanatory material.

*Philosophy's Loss of Logic to Mathematics* Routledge

"An introduction to the life and thought of Kurt Gödel, who transformed our conception of math forever"--Provided by publisher.

**Incompleteness: The Proof and Paradox of Kurt Gödel (Great Discoveries)** Harvard University Press

Discussions of the foundations of mathematics and their history are frequently restricted to logical issues in a narrow sense, or else to traditional problems of analytic philosophy. From Dedekind to Gödel: *Essays on the Development of the Foundations of Mathematics* illustrates the much greater variety of the actual developments in the foundations during the period covered. The viewpoints that serve this purpose included the foundational ideas of working mathematicians, such as Kronecker, Dedekind, Borel and the early Hilbert, and the

development of notions like model and modelling, arbitrary function, completeness, and non-Archimedean structures. The philosophers discussed include not only the household names in logic, but also Husserl, Wittgenstein and Ramsey. Needless to say, such logically-oriented thinkers as Frege, Russell and Gödel are not entirely neglected, either. Audience: Everybody interested in the philosophy and/or history of mathematics will find this book interesting, giving frequently novel insights.

*From Frege to Gödel* W. W. Norton & Company

While many books have been written about Bertrand Russell's philosophy and some on his logic, I. Grattan-Guinness has written the first comprehensive history of the mathematical background, content, and impact of the mathematical logic and philosophy of mathematics that Russell developed with A. N. Whitehead in their *Principia mathematica* (1910-1913). ? This definitive history of a critical period in mathematics includes detailed accounts of the two principal influences upon Russell around 1900: the set theory of Cantor and the mathematical logic of Peano and his followers. Substantial surveys are provided of many related topics and figures of the late nineteenth century: the foundations of mathematical analysis under Weierstrass; the creation of algebraic logic by De Morgan, Boole, Peirce, Schröder, and Jevons; the contributions of Dedekind and Frege; the phenomenology of Husserl; and the proof theory of Hilbert. The many-sided story of the reception is recorded up to 1940, including the rise of logic in Poland and the impact on Vienna Circle philosophers Carnap and Gödel. A strong American theme runs through the story, beginning with the mathematician E. H. Moore and the philosopher Josiah Royce, and stretching through the emergence of Church and Quine, and the 1930s immigration of Carnap and Gödel. Grattan-Guinness draws on around fifty manuscript collections, including the Russell Archives, as well as many original reviews. The bibliography comprises around 1,900 items, bringing to light a wealth of primary materials. Written for mathematicians, logicians, historians, and philosophers--especially those interested in the historical interaction between these disciplines--this authoritative account tells an important story from its most neglected point of view. Whitehead and Russell hoped to show that (much of) mathematics was expressible within their logic; they failed in various ways, but no definitive alternative position emerged then or since.

*From Frege to Gödel* Cambridge, Mass. : Harvard University Press

The logician Kurt Gödel (1906-1978) published a paper in 1931 formulating what have come to be known as his 'incompleteness theorems', which prove, among other things, that within any formal system with resources sufficient to code arithmetic, questions exist which are neither provable nor disprovable on the basis of the axioms which define the system. These are among the most celebrated results in logic today. In this volume, leading philosophers and mathematicians assess important aspects of Gödel's work on the foundations and philosophy of mathematics. Their essays explore almost every aspect of Gödel's intellectual legacy including his concepts of intuition and analyticity, the Completeness Theorem, the set-theoretic multiverse, and the state of mathematical logic today. This groundbreaking volume will be invaluable to students, historians, logicians and philosophers of mathematics who wish to understand the current thinking on these issues.

**From Frege to Gödel** Springer

A layman's guide to the mechanics of Gödel's proof together with a lucid discussion of the issues which it raises. Includes an essay discussing the significance of Gödel's work in the light of Wittgenstein's criticisms.

*Frege and Gödel* Courier Corporation

For many philosophers, modern philosophy begins in 1879 with

the publication of Frege's *Begriffsschrift*, in which Frege presents the first truly modern logic in his symbolic language, *Begriffsschrift*, or concept-script. Macbeth's book, the first full-length study of this language, offers a highly original new reading of Frege's logic based directly on Frege's own two-dimensional notation and his various writings about logic.

**From Frege to Gödel** Wiley-Blackwell

This is an expansion of the author's 1991 work which investigates the implications of Gödel's writings on Einstein's theory of relativity as they relate to the fundamental questions of the nature of time and the possibilities for time travel.