

David Binder · Thomas Piecha ·
Peter Schroeder-Heister
Editors

The Logical Writings of Karl Popper

 Springer

Editors

David Binder
Universität Tübingen
Tübingen, Germany

Thomas Piecha
Universität Tübingen
Tübingen, Germany

Peter Schroeder-Heister
Universität Tübingen
Tübingen, Germany

This work was supported by Dr. Peter Schroeder-Heister.



ISSN 1572-6126

ISSN 2212-7313 (electronic)

Trends in Logic

ISBN 978-3-030-94925-9

ISBN 978-3-030-94926-6 (eBook)

<https://doi.org/10.1007/978-3-030-94926-6>

© The Editor(s) (if applicable) and The Author(s) 2022. This book is an open access publication.

Open Access This book is licensed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits any noncommercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if you modified the licensed material. You do not have permission under this license to share adapted material derived from this book or parts of it.

The images or other third party material in this book are included in the book's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the book's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

This work is subject to copyright. All commercial rights are reserved by the author(s), whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Regarding these commercial rights a non-exclusive license has been granted to the publisher.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland



Karl Popper at Aoraki / Mount Cook, New Zealand in May 1945.

Preface

Although Karl Popper was one of the outstanding philosophers of the twentieth century, his writings on deductive logic are little known. They deserve to be known better: not only historically as part of the work of a great philosopher of science, but also systematically as a significant contribution to the debate on the foundations of logic. Here Popper advocates a view of logic which in more modern terms would be called “inferentialist” (he himself spoke of “inferential definitions” of logical signs). He developed this view of logic during his time in New Zealand (1937–1945) and afterwards in London¹, and published his results in a series of articles in the late 1940s. This work is far more than a by-product. After the composition of *The Open Society and Its Enemies* in 1940–1942 (Popper, 1945a)², which upon its publication in 1945 established Popper’s fame as a social and political philosopher, he spent most of his research time during the following years on formal logic. His articles of 1947–1949 were written “with much enthusiasm”³, and one can well imagine that Popper would have continued these investigations, had they found a better reception in the logic community at the time. Popper even planned to write a textbook on

¹ The frontispiece on the left shows a photograph of Popper taken during a holiday trip to Aoraki / Mount Cook, New Zealand, in May 1945. On the trip back he received a cable from Friedrich Hayek notifying him that the appointment committee of the London School of Economics and Political Science (LSE) had decided positively on his application for a readership in logic and scientific method, which shaped Popper’s future career; cf. Dahrendorf (1995, pp. 422–427) and Hacohen (2002, p. 499).

² Together with *The Poverty of Historicism* (Popper, 1944a,b, 1945b); cf. Popper’s letter to Carnap of 15 October 1942 (this volume, § 23.1).

³ Cf. Popper (1974b, p. 1095, this volume, § 12, p. 217). This is confirmed by a circular of his wife Hennie, of Easter 1947, to a range of New Zealand friends in which she describes “his recent occupation with the salvation of logic” (Hennie Popper, 1947a): “He returned and simply dived back into his logic, saying only sh-sh-sh-sh and do you think one could type this sign on the typewriters? And there was a meeting of some biologists in London, and he went there for the whole day and came back at night late and returned again to his papers. He is terribly excited about it and says he is finding all sorts of simplifications and it’s getting simpler and simpler, and more and more interesting! And it just absorbs him completely.” Brian Boyd has kindly pointed us to this passage.

elementary logic, as a remark in a letter to John C. Eccles of 10 November 1946 shows.⁴

Popper's writings on logic were reviewed by prominent mathematical logicians, and many other logicians and philosophers knew his papers or were at least aware of their existence, as occasional references show. Nevertheless, the overall consideration of this work as a philosophically significant contribution to formal logic and to the foundations of deductive reasoning was limited – something that remains the case today. To improve this situation, our idea was to produce an edition which allows the reader easy access to Popper's logical works, which at the same time is sufficiently comprehensive to cover most aspects of what we consider to be their essence.

The central part of this collection are the six articles published in 1947–1949 on the foundations of deductive logic (Chapters 2–7). They are also the topic of our introduction to Popper's inferentialist conception of logic (Chapter 1). These articles are accompanied by a short note of 1943 (Chapter 8). This note deals with negation in a manner that shows traces of what would be fully developed in the later articles, and which is interesting from the point of view of modern discussions on paraconsistent logics, the *ex falso* rule and disjunctive syllogism. These articles are furthermore accompanied by three later papers written in the 1950s, which exemplify that Popper continued to be interested in logic, although not primarily from the inferentialist perspective. Chapter 9 shows Popper's abiding interest in Tarski's work, here in the definitions of satisfaction and truth in contradistinction to logical consequence, which is the basis of the inferentialist approach. Chapter 10 takes up a discussion of the liar paradox by Fitch, arguing that declaring a liar sentence to be neither true nor false does not escape paradoxicality. Chapter 11 discusses the subjunctive conditional, which plays a significant role in philosophy of science when it comes to the meaning of natural laws. Chapter 12 is reproduced from Schilpp (1974) and presents Popper's reply to Lejewski (1974), who had dealt with Popper's inferential approach to logic. This reply contains many interesting comments on the background to Popper's development of his inferentialist approach. In Chapter 13 we reprint the reviews of Popper's articles on logic. These were written by renowned logicians, and some of them were very critical of Popper's approach, both for conceptual reasons and for reasons of technical exposition. We doubt, however, that these reviews were the reason for the poor reception of Popper's logical works then and now. Even the most critical of these reviews left open the possibility to pursue certain basics of Popper's works in revised forms. We would rather claim that Popper's inferentialism as well as his extensive discussion of dualities and non-classical negations (beyond just intuitionism) was too much ahead of its time. Inferentialism, proof-theoretic semantics and corresponding theories of meaning, apart from their implicit presence

⁴ Popper (1946b); communicated to us by Brian Boyd. Cf. also Popper's (1946a) draft of a letter to Alexander Carr-Saunders, the then director of the LSE, in which he writes: "I may say that I am at present preparing a textbook on formal logic, not because I like writing a textbook (it interferes, on the contrary, badly with my own research programme) but because I find it necessary for my students. The existing textbooks have aims totally different from what I consider to be the aim of a modern introductory course in Logic." A table of contents with possible titles for such a textbook can be found in Popper's Nachlass (KPS Box 371, Folder 1).

in the work of Gentzen, became prominent only in the late 1960s in the aftermath of Prawitz's (1965) interpretation of natural deduction and the establishment of a general proof theory that made the structure of proofs and inferences a topic of philosophical interest.

The second part of this volume presents a number of manuscripts from Popper's Nachlass, which are related to the published papers. Chapter 14 is a draft of a joint paper by Bernays and Popper that did not make it into a publication. Chapter 15 discusses the relation between logical and descriptive signs and situates it in relation to Tarski's concept of logical consequence and to ideas by Carnap in his *Introduction to Semantics* (Carnap, 1942). Chapter 16 is an introduction to an intended study of classical and non-classical negations, which figures prominently in Chapters 5 and 6. Chapter 17 is a somewhat later draft from 1952 which tries to derive truth tables from inferential characterizations. Chapter 18 deals with the distinction between derivation and demonstration, a topic that according to our assessment Popper would have pursued more deeply had he continued to systematically publish in logic. Chapters 19 and 20 are lecture notes (from 1939–1941) and general considerations on the origins of modern logic, respectively. These texts put modern formal logic in a broader philosophical perspective and elucidate how Popper saw logic as a discipline. We here present only a selection of these notes, which we consider to be representative of Popper's views. There are considerably more manuscripts in his Nachlass, though many of them are variants of what is published here.

In the third part we reproduce letters to and from Popper dealing with his logical works. As with the second part, this is a selection of items based on what we consider best suited to situate Popper's logical work and its background in the context of his interactions with colleagues. For somebody who wants to study sophisticated historical issues, letters exchanged with other authors might be relevant, many of which are available in the Karl Popper Collection Klagenfurt and at the Hoover Institution Library & Archives, Stanford.⁵

We decided to omit from this collection materials that deal with one nonetheless important theme, namely Popper's work on Boolean algebra. Popper had studied Boolean algebra already before he moved on to the inferential approach to logic presented here, and studied and discussed it for the rest of his career, combining purely algebraic (lattice-theoretic) investigations with his attempts to axiomatize probability without presupposing deductive logic, and with his interpretation of quantum mechanics and its logic (cf. Miller, 2016; Del Santo, 2020). In Popper's Nachlass one finds a large number of manuscripts dealing with these topics, including bundles full of algebraic calculations, but also with proofs of theorems, some of which are both systematically and historically relevant.⁶ In retrospect, in his autobiography of 1974 (Popper, 1974c), Popper even claims that problems in probability theory

⁵ Popper's literary estate is located at the Hoover Institution Library & Archives in Stanford. The Karl Popper Collection in Klagenfurt contains copies of the literary estate and Popper's private library.

⁶ Del Santo (2020) gives a list of materials from the Karl Popper Collection which are related to the logic of quantum mechanics. Popper himself refers to this work, for example, in the letter to Carnap of 28 May 1944 (this volume, § 23.5). His correspondence with Forder (Chapter 26) is full

led him to his logical work, pointing to the well-known formal relationship between lattice-theoretic and logical properties (Popper, 1974c, fn 188). However, even if this is historically correct and not simply a later attribution⁷, we have two strong reasons to not include Popper's work on Boolean algebra in the present volume. Firstly, formal relationships between Boolean algebra and some aspects of inferentialist logic do not affect at all the philosophical rationale for inferentialism. Popper's inferentialist approach to logic is a philosophical conception in its own right and is also understood and presented by him as such. Thus the present volume is self-contained, even though some ideas and results have formal counterparts in other areas. Secondly, the quantity of the notes and papers on Boolean algebra in the Nachlass, if one combined them with an edition of his published papers on probability theory and probabilistic logic, together with Popper's correspondence on these matters, would be so large that it could easily make a volume of its own. Such a volume would be a very welcome companion to the present one, with many interesting interconnections.

Editorial notes Our editorial corrections and additions are marked by ⟨⟩. Published errata have been included tacitly. Other errata, such as those found in letters or unpublished works are marked by ⟨⟩. Obvious typographic errors have been corrected without indication; however, some orthographic errors in Popper's German letters were left in place since he explicitly mentions that he is making them. In our transcriptions of handwritten manuscripts and letters we write ⟨word?⟩ or "word⟨?⟩" where we were unsure about the correct reading of a word. In quotations we use [], as usual, to frame ellipses and our additions or conversions to facilitate the flow of reading.

Popper's expressions a_1, a_2, \dots, a_n and a_1, a_2, \dots, a_n have been replaced by a_1, a_2, \dots, a_n throughout. The typesetting of formulas has been unified to some extent, and we have made further minor typographic modifications. For example, section numbers or letters have been moved from the beginning of first paragraphs to centered headings, some lists have been reformatted for better readability, and we have changed the font style of author names from small capitals to normal.

Popper usually cites without providing bibliographic details or bibliographies. We provide references in the text in the format ⟨Carnap, 1942⟩ or in editorial footnotes, which are marked by letters ^{a, b, ...}. Numbers ^{1, 2, ...} always signify author footnotes. The references sections at the end of chapters have been added by us. The bibliography at the end of this volume comprises all references.

Page concordances for Popper's published works are provided at the end of this volume. In published works, original page breaks are indicated by the symbol | with the original page number in the left margin. Three papers, namely Popper (1947d, 1948a,c), were published both by the Royal Netherlands Academy of Sciences and in *Indagationes Mathematicae* using the same printing plates (with minor adjustments

of references to Boolean algebra and of discussions of Boolean algebra problems related to logic. The letter to Kleene (§ 28.1) relates to his later interest in the logic of quantum mechanics.

⁷ Namely, an attribution made at a time when Popper was involved in issues of probability theory and quantum mechanics. In the logical writings themselves he always describes Tarski's notion of logical consequence as his starting point.

to the titles in *Indagationes Mathematicae*). We give preference to the former, but also provide page numbers of the latter in the respective [concordances](#).

In Popper's unpublished manuscripts and in his correspondence we indicate page breaks also by the symbol | with page numbers in the left margin. Underlined text is rendered in italics. English translations of letters written in German are provided by us. In many cases, only carbon copies or drafts of letters sent were available to us. These may lack the sender's signature; we have not added it in these cases.

There is a combined person and subject index for the whole volume. As this book is published open access, the reader can also use the freely available electronic version for searches.

Popper almost never wrote abstracts. Those featured in this collection are our additions. Editorial notes for the respective works are given below these abstracts.

References like "KPS Box 12, Folder 10" refer to Popper's Nachlass in the Karl Popper Collection ("Karl Popper-Sammlung") Klagenfurt, which was our main source for Popper's unpublished work.

Copyright information With effect from 1 October 2008, the rights to the works and correspondence of Karl Popper were transferred to the Alpen-Adria-Universität Klagenfurt / Karl Popper Collection by the previous estate managers (The Estate of Karl Popper, Raymond and Melitta Mew, South Croydon, England). Since then, the Karl Popper Collection has been affiliated with the Karl Popper Copyright Office, which has graciously granted us the rights to publish Popper's writings and correspondence in this volume. They are published

*With permission of University of Klagenfurt / Karl Popper Library.
All rights reserved.*

In addition, we have contacted all publishers of previously published works to ensure that no objections whatsoever exist. The copyright of the reviews Kemeny (1957), Kleene (1948, 1949), McKinsey (1948), and Nagel (1943) in the *Journal of Symbolic Logic* is held by the Association for Symbolic Logic, which kindly gave us permission to reprint them in this volume. Further materials are used with permission by the ETH Zürich Research Collection and by Ludwig Bernays for letters written by Paul Bernays, and from the Houghton Library Harvard for letters written by Willard Van Orman Quine. Concerning permission to publish letters by Henry George Forder, we thank the Special Collections Kohikohinga Motuhake, General Library Te Herenga Mātauranga Whānui, the Department of Mathematics and the Department of Computer Science at the University of Auckland for their positive response. Additional information on letters published in this collection can be found in editorial notes preceding the respective correspondences. The permission to publish the portrait photograph of Karl Popper (1939) and the photograph of Karl Popper at Aoraki / Mount Cook, New Zealand in May 1945 (cf. Wigley, 1945) was obtained from the Macmillan Brown Library, University of Canterbury.

Acknowledgements We are very grateful to Nicole Sager and Manfred Lube, who very kindly supported us during several stays at the Karl Popper Collection, to Thomas

Hainscho from the Karl Popper Copyright Office, to David Miller for his continuous support of this editorial project and for many detailed comments and suggestions on our manuscript, and to the Karl Popper Foundation and its president Reinhard Neck for contributing to the publication costs of this volume. We thank Katherine Pawley and Garry J. Tee at the University of Auckland for information on Popper's correspondence with Henry George Forder, as well as Brian Boyd, University of Auckland, for sharing some scans of Popper's work with us, and workers at the ETH Zürich Research Collection and the Houghton Library Harvard for their help. We would also like to thank the organizers and participants of several conferences at which we had opportunity to present and discuss our research on Karl Popper's logical works. Finally, we would like to express our gratitude to the editor of the Springer series *Trends in Logic*, Heinrich Wansing, for strongly supporting our project, and to Christopher V. Jones for many helpful comments on the final draft of this volume.

Thomas Piecha and Peter Schroeder-Heister were supported by the French-German ANR-DFG project "Beyond Logic: Hypothetical Reasoning in Philosophy of Science, Informatics, and Law", DFG grant Schr 275/17-1. David Binder and Thomas Piecha were supported by the DFG project "Constructive Semantics and the Completeness Problem", DFG grant PI 1174/1-1. Thomas Piecha is very grateful for the hospitality received at the Institut d'histoire et de philosophie des sciences et des techniques (IHPST) in Paris during the winter semester 2018/19, and Peter Schroeder-Heister thanks the Swedish Collegium for Advanced Study (SCAS) for the excellent working conditions provided during his fellowship in the spring semester 2020.

Tübingen, September 2021

David Binder
Thomas Piecha
Peter Schroeder-Heister

References

- Carnap, R. (1942). *Introduction to Semantics*. Harvard University Press.
- Dahrendorf, R. (1995). *LSE: A History of the London School of Economics and Political Science 1895–1995*. Oxford University Press.
- Del Santo, F. (2020). An Unpublished Debate Brought to Light: Karl Popper's Enterprise against the Logic of Quantum Mechanics. In: *Studies in History and Philosophy of Science Part B: Studies in History and Philosophy of Modern Physics* 70, pp. 65–78.
- Hacohen, M. H. (2002). *Karl Popper – The Formative Years, 1902–1945. Politics and Philosophy in Interwar Vienna*. Cambridge University Press.
- Kemeny, J. G. (1957). Review of A Note on Tarski's Definition of Truth. In: *Journal of Symbolic Logic* 22 (4), p. 365. URL: <http://www.jstor.org/stable/2963928>. Reprinted as § 13.11 of this volume.

- Kleene, S. C. (1948). Review of Functional Logic without Axioms or Primitive Rules of Inference. In: *Journal of Symbolic Logic* 13 (3), pp. 173–174. Reprinted as § 13.12 of this volume.
- (1949). Review of On the Theory of Deduction, Part I and II, and The Trivialization of Mathematical Logic. In: *Journal of Symbolic Logic* 14 (1), pp. 62–63. Reprinted as § 13.13 of this volume.
- Lejewski, C. (1974). Popper's Theory of Formal or Deductive Inference. In: *The Philosophy of Karl Popper*. Ed. by P. A. Schilpp. The Library of Living Philosophers. La Salle, Illinois: Open Court, pp. 632–670.
- McKinsey, J. C. C. (1948). Review of Logic without Assumptions and New Foundations for Logic. In: *Journal of Symbolic Logic* 13 (2), pp. 114–115. Reprinted as § 13.14 of this volume.
- Miller, D. (2016). Popper's Contributions to the Theory of Probability and Its Interpretation. In: *The Cambridge Companion to Popper*. Ed. by J. Shearmur and G. Stokes. Cambridge University Press, pp. 230–268.
- Nagel, E. (1943). Review of Are Contradictions Embracing? In: *Journal of Symbolic Logic* 8 (1), pp. 48–49. Reprinted as § 13.15 of this volume.
- Popper, H. (1947a). Circular of Easter 1947 to a range of New Zealand friends. In: Macmillan Brown Library, University of Canterbury, Collection MB 155 – George Emanuel Roth papers, Reference 80346.
- Popper, K. R. (1939). Portrait of Karl Popper, submitted as part of his application for employment at Canterbury University College. In: Macmillan Brown Library, University of Canterbury, Reference 15977. Processed by the editors.
- (1944a). The Poverty of Historicism, I. In: *Economica* 11 (42), pp. 86–103. Cf. Popper (1957).
 - (1944b). The Poverty of Historicism, II. In: *Economica* 11 (43), pp. 119–137. Cf. Popper (1957).
 - (1945a). *The Open Society and Its Enemies*. London: Routledge.
 - (1945b). The Poverty of Historicism, III. In: *Economica* 12 (46), pp. 69–89. Cf. Popper (1957).
 - (1946a). Draft of a letter to Alexander Carr-Saunders. Karl Popper Collection Klagenfurt, Box 368, Folder 2.
 - (1946b). Letter to John C. Eccles of 10 November 1946. In: John C. Eccles Archive, Library for History, Theory and Ethics of Medicine, Heinrich Heine University Düsseldorf; sig. 2NZ-1105.
 - (1947d). Functional Logic without Axioms or Primitive Rules of Inference. In: *Koninklijke Nederlandse Akademie van Wetenschappen, Proceedings of the Section of Sciences* 50, pp. 1214–1224. Reprinted as Chapter 4 of this volume.
 - (1948a). On the Theory of Deduction, Part I. Derivation and its Generalizations. In: *Koninklijke Nederlandse Akademie van Wetenschappen, Proceedings of the Section of Sciences* 51, pp. 173–183. Reprinted as Chapter 5 of this volume.
 - (1948c). On the Theory of Deduction, Part II. The Definitions of Classical and Intuitionist Negation. In: *Koninklijke Nederlandse Akademie van Wetenschappen, Proceedings of the Section of Sciences* 51, pp. 322–331. Reprinted as Chapter 6 of this volume.

- Popper, K. R. (1957). *The Poverty of Historicism*. London: Routledge & Kegan Paul.
- (1974b). Lejewski’s Axiomatization of My Theory of Deducibility. In: *The Philosophy of Karl Popper*. Ed. by P. A. Schilpp. The Library of Living Philosophers. La Salle, Illinois: Open Court, pp. 1095–1096. Reprinted as Chapter 12 of this volume.
 - (1974c). Part One: Autobiography of Karl Popper. In: *The Philosophy of Karl Popper*. Ed. by P. A. Schilpp. The Library of Living Philosophers. La Salle, Illinois: Open Court, pp. 1–181.
- Schilpp, P. A., ed. (1974). *The Philosophy of Karl Popper*. The Library of Living Philosophers. La Salle, Illinois: Open Court.
- Wigley, M. (1945). Photograph of Dr. and Mrs Karl Popper, the Ball Hut road behind. In: Macmillan Brown Library, University of Canterbury, Reference 26976. Cropped and processed by the editors. Cf. also *Popper and Prior in New Zealand*, <http://popper-prior.nz/items/show/214>, accessed 1 September 2021.

Contents

1	Popper's Theory of Deductive Logic	1
	David Binder, Thomas Piecha, and Peter Schroeder-Heister	
1	General introduction	4
1.1	Deducibility: From Tarskianism to inferentialism	4
1.2	Logical relations	7
1.3	Logical operators and inferential definitions	10
1.4	Logical laws and the trivialization of logic	12
1.5	Popper and proof-theoretic semantics	13
2	The reception of Popper's logical writings	15
3	Popper's structural framework	18
3.1	Object languages	18
3.2	The concept of deducibility	19
3.3	The metalanguage	20
3.4	The characterization of deducibility by a basis	22
4	The general theory of derivation	24
4.1	Mutual deducibility	24
4.2	Complementarity and demonstrability	25
4.3	Contradictoriness and refutability	25
4.4	Relative demonstrability	26
4.5	Relative demonstrability and cut	28
4.6	The development of Popper's formulation of a basis	30
5	The special theory of derivation	36
5.1	Definitions of logical constants	36
5.2	Popper's definitional criterion of logicity	38
5.3	Not-strictly-logical operations and the understanding of logical notation	40
5.4	Popper's notion of duality	42
5.5	Conjunction and disjunction	43
5.6	Conditional and anti-conditional	45
5.7	Characterizations of implication and Peirce's rule	46
5.8	Conjoint denial, alternative denial and further connectives	48

- 6 Negations 49
 - 6.1 Classical negation 49
 - 6.2 Intuitionistic negation and dual-intuitionistic negation ... 50
 - 6.3 Non-conservative language extensions 51
 - 6.4 Six further kinds of negation 53
- 7 Modal logic 57
- 8 Bi-intuitionistic logic 59
- 9 The theory of quantification 62
 - 9.1 Formulas, name-variables and substitution 62
 - 9.2 Non-dependence, identity and difference 65
 - 9.3 Quantification 67
 - 9.4 An unfortunate misunderstanding 69
- References 72

Part I Published Articles

- 2 Logic without Assumptions (1947) 83**
 - Karl R. Popper
 - (1) 84
 - (2) 90
 - (3) 92
 - (4) 96
 - (5) 98
 - (6) 99
 - (7) 103
 - (8) 108
 - (9) 109
 - References 111
- 3 New Foundations for Logic (1947) 113**
 - Karl R. Popper
 - 1. Introduction 113
 - 2. General Theory of Derivation 114
 - 3. Another Approach. Conjunction 123
 - 4. The Logic of Compound Statements 130
 - 5. Explicit Definitions of the Compounds 135
 - 6. Statement-Functions. Substitution as a Logical Operation 138
 - 7. Quantification 144
 - 8. Derivation and Demonstration 145
 - 9. Metalanguage and Object Language 148
 - References 150
- 4 Functional Logic without Axioms or Primitive Rules of Inference (1947) 153**
 - Karl R. Popper
 - I 153

II	155
III	156
IV	157
V	158
VI	160
VII	161
VIII	162
IX	163
X	164
References	165
5 On the Theory of Deduction, Part I. Derivation and its Generalizations (1948)	167
Karl R. Popper	
I	168
II	172
III	175
References	179
6 On the Theory of Deduction, Part II. The Definitions of Classical and Intuitionist Negation (1948)	181
Karl R. Popper	
IV	181
V	184
VI	187
VII	189
References	191
7 The Trivialization of Mathematical Logic (1949)	193
Karl R. Popper	
(1)	193
(2)	194
(3)	197
References	199
8 Are Contradictions Embracing? (1943)	201
Karl R. Popper	
(A)	201
(B)	203
(C)	204
(D)	204
References	205
9 A Note on Tarski's Definition of Truth (1955)	207
Karl R. Popper	
References	210

10	On a Proposed Solution of the Paradox of the Liar (1955)	211
	Karl R. Popper	
	References	212
11	On Subjunctive Conditionals with Impossible Antecedents (1959) ...	213
	Karl R. Popper	
	References	216
12	Lejewski's Axiomatization of My Theory of Deducibility (1974)	217
	Karl R. Popper	
	I	217
	II	218
	III	218
	References	219
13	Reviews of Popper's Articles on Logic	221
	Wilhelm Ackermann, Evert W. Beth, Haskell B. Curry, Gisbert Hasenjaeger, John G. Kemeny, Stephen C. Kleene, John C. C. McKinsey, and Ernest Nagel	
	13.1 Ackermann (1948): Review of "Functional Logic without Axioms or Primitive Rules of Inference" (Popper, 1947d)	221
	13.2 Ackermann (1949a): Review of "On the Theory of Deduction, Part I" (Popper, 1948a)	222
	13.3 Ackermann (1949b): Review of "On the Theory of Deduction, Part II" (Popper, 1948c)	222
	13.4 Beth (1948): Review of "New Foundations for Logic" (Popper, 1947c)	223
	13.5 Curry (1948a): Review of "Functional Logic without Axioms or Primitive Rules of Inference" (Popper, 1947d)	224
	13.6 Curry (1948b): Review of "Logic without Assumptions" (Popper, 1947b)	225
	13.7 Curry (1948c): Review of "On the Theory of Deduction, Part I" (Popper, 1948a)	225
	13.8 Curry (1948d): Review of "On the Theory of Deduction, Part II" (Popper, 1948c)	226
	13.9 Curry (1949): Review of "The Trivialization of Mathematical Logic" (Popper, 1949a)	226
	13.10 Hasenjaeger (1949): Review of "The Trivialization of Mathematical Logic" (Popper, 1949a)	227
	13.11 Kemeny (1957): Review of "A Note on Tarski's Definition of Truth" (Popper, 1955a)	227
	13.12 Kleene (1948): Review of "Functional Logic without Axioms or Primitive Rules of Inference" (Popper, 1947d)	228
	13.13 Kleene (1949): Review of "On the Theory of Deduction, Part I & II" and "The Trivialization of Mathematical Logic" (Popper, 1948a,c, 1949a)	229

13.14 McKinsey (1948): Review of “Logic without Assumptions” and
 “New Foundations for Logic” (Popper, 1947b,c) 229

13.15 Nagel (1943): Review of “Are Contradictions Embracing?”
 (Popper, 1943) 231

References 231

Part II Unpublished Manuscripts

14 On Systems of Rules of Inference 237
 Paul Bernays and Karl R. Popper

1. Notation 237

2. General Theory. Primitive Rules 238

3. Relation between this Method and that of Consequence Classes 241

4. Primitive Rules for Propositional Logic 243

5. Pure Rules of Derivation 246

6. Simplified Systems 249

7. Completeness of the Various Systems 258

Endnote 259

References 260

15 A General Theory of Inference 261
 Karl R. Popper

1. Distinction Between General And Special Theories Of Inference 261

2. Contributions to the Problem 262

3. Steps towards Tarski’s Definition of Logical Consequence 263

4. Tarski’s Definition of Logical Consequence 265

5. Criticism of Tarski’s Definition. Present State of the Problem 267

6. Reformulation of Tarski’s Definition 268

7. Relativization of the Concept 271

8. A Method of an Absolute Characterization of Formative Signs 272

References 272

16 On the Logic of Negation 275
 Karl R. Popper

§ 1 275

§ 2 277

§ 3 280

References 281

17 A Note on the Classical Conditional 283
 Karl R. Popper

Typescript 1 283

Typescript 2 294

References 300

18 Three Notes on Derivation and Demonstration 301
 Karl R. Popper

18.1	Derivation and Demonstration in Propositional and Functional Logic	301
18.2	〈The Distinction Between Derivation and Demonstration〉	304
18.3	The Propositional and Functional Logic of Derivation and of Demonstration	306
	References	312
19	Lecture Notes on Logic (1939–1941)	313
	Karl R. Popper	
	〈Overview〉	314
	Introduction	315
	I. Preliminary Remarks.	315
	II. What Do We Call Logic?	316
	III. What Do We Call Deductive or Formal Logic?	317
	IV. The Rule of the Transmission of Truth (The First Rule About Inference.)	322
	V. The Second Rule About Inference (Converse of the First).	325
	VI. Some Remarks About the Concept of Truth.	325
	VII. Truth in the Sciences and in Logic.	326
	Chapter I. What Do We Call a “Rule of Inference”?	327
	Chapter II. The Use of Symbols and Variables in Logic	334
	Chapter III. Descriptive and Logical Constants. The Logical Form of Statements and Arguments.	337
	Chapter IV. Statements Which Are Formally True. Analytic and Synthetic Sentences.	340
	Chapter V. Some Famous Analytic Statements – The So-Called “Laws of Thought”.	343
	References	346
20	The Origins of Modern Logic	347
	Karl R. Popper	
	Note on the Concept of TRUTH	351
	Remarks about Truth	352
	To define Conjunction and Disjunction	353
	Criticism of W. E. Johnson	354
	The Consequence Relation and Analytic Implication	354
	Remarks on the Theory of Deducibility	356
	The Concept of Truth	358
	The Logic of Thought and the Logic of Linguistic Form	359
	3. The problem of Induction	366
	The Development of the Vienna Circle.	368
	Criticism of Physicalism and the Unity of Science	369
	The Nature of Logic and Mathematics	372
	Axiom Systems	373
	References	373

Part III Correspondence

21 Popper's Correspondence with Paul Bernays	377
Karl R. Popper and Paul Bernays	
21.1 Popper to Bernays, 22 December 1946	377
21.2 Popper to Bernays, n.d.	379
21.3 Popper to Bernays, 3 March 1947	381
21.4 Bernays to Popper, 12 March 1947	382
21.5 Bernays to Popper, 1 April 1947	383
21.6 Popper to Bernays, 19 October 1947	384
21.7 Bernays to Popper, 12 May 1948	386
21.8 Popper to Bernays, 13 June 1948	391
21.8.1 Corrections to Logic without Assumptions	395
21.9 Bernays to Popper, 27 July 1948	398
21.10 Bernays to Popper, 28 July 1948	402
21.11 Popper to Bernays, 31 July 1948	402
21.12 Bernays to Gödel, 24 January 1975	403
References	405
22 Popper's Correspondence with Luitzen Egbertus Jan Brouwer	407
Karl R. Popper and Luitzen E. J. Brouwer	
22.1 Brouwer to Popper, 27 August 1947	407
22.2 Brouwer to Popper, 25 October 1947	408
22.3 Brouwer to Popper, n.d.	408
22.4 Popper to Brouwer, 18 November 1947	409
22.5 Brouwer to Popper, 10 December 1947	410
22.6 Brouwer to Popper, 4 January 1948	410
22.7 Brouwer to Popper, 6 January 1948	411
22.8 Brouwer to Popper, 19 January 1948	411
22.9 Brouwer to Jeffreys, 4 May 1948	412
22.10 Jeffreys to Brouwer, 7 May 1948	412
22.11 Brouwer to Popper, 7 May 1948	412
22.12 Brouwer to Jeffreys, 11 May 1948	413
22.13 Brouwer to Popper, 29 November 1951	414
References	415
23 Popper's Correspondence with Rudolf Carnap	417
Karl R. Popper and Rudolf Carnap	
23.1 Popper to Carnap, 15 October 1942	417
23.2 Carnap to Popper, 29 January 1943	421
23.3 Popper to Carnap, 31 March 1943	422
23.4 Popper to Carnap, 5 July 1943	422
23.5 Popper to Carnap, 28 May 1944	425
23.6 Carnap to Popper, 9 December 1944	426
23.7 Popper to Carnap, 11 February 1945	426
23.8 Carnap to Popper, 30 May 1945	427

23.9 Popper to Carnap, 23 June 1945 428

23.10 Carnap to Popper, 9 October 1947 429

23.11 Popper to Carnap, 24 November 1947 430

References 433

24 Popper’s Correspondence with Alonzo Church 435

Karl R. Popper and Alonzo Church

24.1 Church to Popper, 28 October 1947 435

24.2 Church to Popper, 11 December 1947 436

24.3 Popper to Church, 16 February 1948 437

24.4 Church to Popper, 20 February 1948 437

References 438

25 Popper’s Correspondence with Kalman Joseph Cohen 439

Karl R. Popper and Kalman J. Cohen

25.1 Cohen to Popper, 14 February 1953 439

25.2 Cohen to Popper, 19 February 1953 440

25.3 Cohen to Popper, 1 March 1953 441

25.4 Cohen to Popper, 7 May 1953 441

25.5 Cohen to Popper, 26 May 1953 442

25.6 Cohen to Popper, 16 June 1953 444

25.7 Popper to Cohen, 28 July 1953 445

25.8 Popper to Cohen, 3 August 1953 446

25.9 Cohen to Popper, 22 April 1954 447

References 449

26 Popper’s Correspondence with Henry George Forder 451

Karl R. Popper and Henry George Forder

26.1 Forder to Popper, 20 February 1943 451

26.2 Popper to Forder, 5 March 1943 452

26.3 Forder to Popper, 30 April 1943 453

26.4 Popper to Forder, 7 May 1943 456

26.5 Forder to Popper, 12 June 1943 460

26.6 Forder to Popper, 29 June 1943 461

26.7 Popper to Forder, 21 July 1943 463

26.8 Forder to Popper, 26 July or 2 or 9 August 1943 464

26.9 Forder to Popper, between 21 July and 11 August 1943 464

26.10 Popper to Forder, 11 August 1943 466

26.11 Forder to Popper, 16 August 1943 467

26.12 Forder to Popper, 1 September 1943 468

26.13 Forder to Popper, 13 September 1943 469

26.14 Forder to Popper, 21 October 1943 470

26.15 Forder to Popper, 26 October 1943 470

26.16 Popper to Forder, 4 November 1943 471

26.17 Popper to Forder, 13 November 1943 471

26.18 Forder to Popper, 3rd week of November 1943 473

26.19	Popper to Forder, 23 November 1943	475
26.20	Popper to Forder, 21 December 1943	478
26.21	Forder to Popper, 1 March 1944	480
26.22	Forder to Popper, maybe 8 or 9 July 1945	481
26.23	Forder to Popper, 23 July 1945	482
	References	483
27	Popper's Correspondence with Harold Jeffreys	485
	Karl R. Popper and Harold Jeffreys	
27.1	Popper to Jeffreys, 26 April 1942	485
	References	487
28	Popper's Correspondence with Stephen Cole Kleene	489
	Karl R. Popper and Stephen C. Kleene	
28.1	Popper to Kleene, 19 April 1968	489
	References	490
29	Popper's Correspondence with William Calvert Kneale	491
	Karl R. Popper and William C. Kneale	
29.1	Kneale to Popper, 5 September 1947	491
29.2	Popper to Kneale, 30 June 1948	492
	References	493
30	Popper's Correspondence with Willard Van Orman Quine	495
	Karl R. Popper and Willard V. O. Quine	
30.1	Popper to Quine, 2 February 1948	495
30.2	Quine to Popper, 21 March 1948	496
30.3	Popper to Quine, 6 April 1948	497
30.4	Quine to Popper, 19 April 1948	498
30.5	Popper to Quine, 13 June 1948	499
	30.5.1 Corrections to Logic without Assumptions	501
30.6	Quine to Popper, 5 October 1948	504
30.7	Popper to Quine, 28 November 1948	504
	References	505
31	Popper's Correspondence with Heinrich Scholz	507
	Karl R. Popper and Heinrich Scholz	
31.1	Scholz to Popper, 17 November 1947	507
	References	508
32	Popper's Correspondence with Peter Schroeder-Heister	509
	Karl R. Popper and Peter Schroeder-Heister	
32.1	Schroeder-Heister to Popper, 1 July 1982	509
32.2	Popper to Schroeder-Heister, 9 July 1982	511
32.3	Popper to Schroeder-Heister, 10 July 1982	513
32.4	Schroeder-Heister to Popper, 20 July 1982	514
32.5	Popper to Schroeder-Heister, 19 August 1982	515

32.6 Schroeder-Heister to Popper, 14 March 1983 517
32.7 Popper to Schroeder-Heister, 16 March 1983 518
32.8 Schroeder-Heister to Popper, 21 March 1983 519
32.9 Popper to Schroeder-Heister, 10 August 1983 520
References 521

Concordances 523

Bibliography 529
 Publications by Karl R. Popper 529
 Reviews 531
 Other References 532

Index 543