

# Metamathematics Machines And Godels Proof

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## Paradoxes

*Strongly Correlated Fermions and Bosons in Low-Dimensional Disordered Systems* Igor V. Lerner 2002-07-31 The physics of strongly correlated fermions and bosons in a disordered environment and confined geometries is at the focus of intense experimental and theoretical research efforts. Advances in material technology and in low temperature techniques during the last few years led to the discoveries of new physical of atomic gases and a possible metal phenomena including Bose condensation insulator transition in two-dimensional high mobility electron structures. Situations were the electronic system is so dominated by interactions that the old concepts of a Fermi liquid do not necessarily make a good starting point are now routinely achieved. This is particularly true in the theory of low dimensional systems such as carbon nanotubes, or in two dimensional electron gases in high mobility devices where the electrons can form a variety of new structures. In many of these systems disorder is an unavoidable complication and lead to a host of rich physical phenomena. This has pushed the forefront of fundamental research in condensed matter towards the edge where the interplay between many-body correlations and quantum interference enhanced by disorder has become the key to the understanding of novel phenomena.

*Derivation and Computation* H. Simmons 2000-05-18 Mathematics is about proofs, that is the derivation of correct statements; and calculations, that is the production of results according to well-defined sets of rules. The two notions are intimately related. Proofs can involve calculations, and the algorithm underlying a calculation should be proved correct. The aim of the author is to explore this relationship. The book itself forms an introduction to simple type theory. Starting from the familiar propositional calculus the author develops the central idea of an applied lambda-calculus. This is illustrated by an account of Gödel's T, a system which codifies number-theoretic function hierarchies. Each of the book's 52 sections ends with a set of exercises, some 200 in total. These are designed to help the reader get to grips with the subject, and develop a further understanding. An appendix contains complete solutions of these exercises.

*Term Rewriting Systems* Terese 2003-03-20 Term rewriting systems developed out of mathematical logic and are an important part of theoretical computer science. They consist of sequences of discrete transformation steps where one term is replaced with another and have applications in many areas, from functional programming to automatic theorem proving and computer algebra. This 2003 book starts at an elementary level with the earlier chapters providing a foundation for the rest of the work. Much of the advanced material appeared here for the first time in book form. Subjects treated include orthogonality, termination, completion, lambda calculus, higher-order rewriting, infinitary rewriting and term graph rewriting. Many exercises are included with selected solutions provided on the web. A comprehensive bibliography makes this book ideal both for teaching and research. A chapter is included presenting applications of term rewriting systems, with many pointers to actual implementations.

**Piton** J Strother Moore 2007-08-28 Mountaineers use pitons to protect themselves from falls. The lead climber wears a harness to which a rope is tied. As the climber ascends, the rope is paid out by a partner on the ground. As described thus far, the climber receives no protection from the rope or the partner. However, the climber generally carries several spike-like pitons and stops when possible to drive one into a small crack or crevice in the rock face. After climbing just above the piton, the climber clips the rope to the piton, using slings and carabiners. A subsequent fall would result in the climber hanging from the piton—if the piton stays in the rock, the slings and carabiners do not fail, the rope does not break, the partner is holding the rope taut and secure, and the climber had not climbed too high above the piton before falling. The climber's safety clearly depends on all of the components of the system. But the piton is distinguished because it connects the natural to the artificial. In 1987 I designed an assembly-level language for Warren Hunt's FM8501 verified microprocessor. I wanted the language to be conveniently used as the object code produced by verified compilers. Thus, I envisioned the language as the first software link in a trusted chain from verified hardware to verified applications programs. Thinking of the hardware as the "rock" I named the language "Piton."

*Automated Technology for Verification and Analysis* Bernd Finkbeiner 2015-10-07 This book constitutes the proceedings of the 13th International Symposium on Automated Technology for Verification and Analysis, ATVA 2015, held in Shanghai, China, in October 2015. The 27 revised papers presented together with 6 tool papers in this volume were carefully reviewed and selected from 95 submissions. They show current research on theoretical and practical aspects of automated analysis, verification and synthesis by providing an international forum for interaction among the researchers in academia and industry.

**Lady Gaga and Popular Music** Martin Iddon 2014-01-03 This book is a multi-faceted, interdisciplinary examination of the music and figure of Lady Gaga, combining approaches from scholars in cultural studies, art, fashion, and music. It represents one of the first scholarly volumes devoted to Lady Gaga, who has become, over a few short years, central to both popular (and, indeed, populist) as well as more scholarly thought in these areas and who, the contributors argue, is helping to shape—directly and indirectly—thought and culture both in the fields of the "scholarly" and the "everyday." Lady Gaga's output is firmly embedded in a self-consciously intellectual pop culture tradition, and her music videos are intertextually linked to icons of pop culture intelligentsia like Alfred Hitchcock and open to multiple interpretations. In examining her music and figure, this volume contributes both to debates on the status of intertextuality, held in tension with originality, and to debates on the figuring of the sexualized female body, and representations of disability. There is interest in these issues from a wide range of disciplines: popular musicology, film studies, queer studies, women's studies, gender studies, disability studies, popular culture studies, and the burgeoning sub-discipline of aesthetics and philosophy of fashion.

**Free Choice Petri Nets** Jorg Desel 1995-01-12 Petri nets are a popular and powerful model for analyzing and modeling concurrent systems, and a rich theory has developed around them. This book focuses on a particular class of Petri nets, free choice Petri nets, which plays a central role in the theory. The text is organized very clearly, with every notion carefully explained and every result proved. The authors give clear exposition of place invariants, siphons, traps and many other important analysis techniques. The book contains classical results of free-choice theory as well as more recent results. The material is organized along the lines of a course, and each chapter contains numerous exercises, making this text ideal for graduate students and research workers alike.

**Modal Logic** Patrick Blackburn 2002-08-22 This is an advanced 2001 textbook on modal logic, a field which caught the attention of computer scientists in the late 1970s. Researchers in areas ranging from economics to computational linguistics have since realised its worth. The book is for novices and for more experienced readers, with two distinct tracks clearly signposted at the start of each chapter. The development is mathematical; prior acquaintance with first-order logic and its semantics is assumed, and familiarity with the basic mathematical notions of set theory is required. The authors focus on the use of modal languages as tools to analyze the properties of relational structures, including their algorithmic and algebraic aspects, and applications to issues in logic and computer science such as completeness, computability and complexity are considered. Three appendices supply basic background information and numerous exercises are provided. Ideal for anyone wanting to learn modern modal logic.

**Coordination, Organizations, Institutions, and Norms in Agent Systems III** Jaime Simão Sichman 2008-03-21 This book constitutes the refereed post-workshop proceedings of the International Workshop on Coordination, Organization, Institutions and Norms in Agent Systems, COIN 2007. The 23 papers in this volume were carefully selected from 38 initial submissions.

**The Cambridge Handbook of Computational Psychology** Ron Sun 2008-04-28 A cutting-edge reference source for the interdisciplinary field of computational cognitive modeling.

*The Optimal Implementation of Functional Programming Languages* Andrea Asperti 1998-12-03 First account of the subject by two of its leading exponents. Essentially self-contained.

**Computer-Aided Reasoning** Matt Kaufmann 2013-04-17 Computer-Aided Reasoning: ACL2 Case Studies illustrates how the computer-aided reasoning system ACL2 can be used in productive and innovative ways to design, build, and maintain hardware and software systems. Included here are technical papers written by twenty-one contributors that report on self-contained case studies, some of which are sanitized industrial projects. The papers deal with a wide variety of ideas, including floating-point arithmetic, microprocessor simulation, model checking, symbolic trajectory evaluation, compilation, proof checking, real analysis, and several others. Computer-Aided Reasoning: ACL2 Case Studies is meant for two audiences: those looking for innovative ways to design, build, and maintain hardware and software systems faster and more reliably, and those wishing to learn how to do this. The former audience includes project managers and students in survey-oriented courses. The latter audience includes students and professionals pursuing rigorous approaches to hardware and software engineering or formal methods. Computer-Aided Reasoning: ACL2 Case Studies can be used in graduate and upper-division undergraduate courses on Software Engineering, Formal Methods, Hardware Design, Theory of Computation, Artificial Intelligence, and Automated Reasoning. The book is divided into two parts. Part I begins with a discussion of the effort involved in using ACL2. It also contains a brief introduction to the ACL2 logic and its mechanization, which is intended to give the reader sufficient background to read the case studies. A more thorough, textbook introduction to ACL2 may be found in the companion book, Computer-Aided Reasoning: An Approach. The heart of the book is Part II, where the case studies are presented. The case studies contain exercises whose solutions are on the Web. In addition, the complete ACL2 scripts necessary to formalize the models and prove all the properties discussed are on the Web. For example, when we say that one of the case studies formalizes a floating-point multiplier and proves it correct, we mean that not only can you read an English description of the model and how it was proved correct, but you can obtain the entire formal content of the project and replay the proofs, if you wish, with your copy of ACL2. ACL2 may be obtained from its home page. The results reported in each case study, as ACL2 input scripts, as well as exercise solutions for both books, are available from this page.

**An Introduction to Gödel's Theorems** Peter Smith 2007-07-26 Peter Smith examines Gödel's Theorems, how they were established and why they matter. **Topology Via Logic** Steven Vickers 1996-08-22 Now in paperback, Topology via Logic is an advanced textbook on topology for computer scientists. Based on a course given by the author to postgraduate students of computer science at Imperial College, it has three unusual features. First, the introduction is from the locale viewpoint, motivated by the logic of finite observations: this provides a more direct approach than the traditional one based on abstracting properties of open sets in the real line. Second, the methods of locale theory are freely exploited. Third, there is substantial discussion of some computer science applications. Although books on topology aimed at mathematicians exist, no book has been written specifically for computer scientists. As computer scientists become more aware of the mathematical foundations of their discipline, it is appropriate that such topics are presented in a form of direct relevance and applicability. This book goes some way towards bridging the gap.

**Nonlinearity, Complexity and Randomness in Economics** Stefano Zambelli 2012-01-17 Nonlinearity, Complexity and Randomness in Economics presents a variety of papers by leading economists, scientists, and philosophers who focus on different aspects of nonlinearity, complexity and randomness, and their implications for economics. Atheme of the book is that economics should be based on algorithmic, computable mathematical foundations. Features an interdisciplinary collection of papers by economists, scientists, and philosophers Presents new approaches to macroeconomic modelling, agent-based modelling, financial markets, and emergent complexity Reveals how economics today must be based on algorithmic, computable mathematical foundations

**Automated Deduction - CADE 27** Pascal Fontaine 2019-08-20 This book constitutes the proceeding of the 27th International Conference on Automated Deduction, CADE 27, held in Natal, Brazil, in August 2019. The 27 full papers and 7 system descriptions presented were carefully reviewed and selected from 65 submissions. CADE is the major forum for the presentation of research in all aspects of automated deduction, including foundations, applications, implementations, and practical experience.

*Propositional Logic* Hans Kleine Büning 1999-08-28 Algorithmic approach to logic, with new and classical results, and applications to VLSI, databases etc. **Domains and Lambda-Calculi** Roberto M. Amadio 1998-07-02 Graduate text on mathematical foundations of programming languages, and operational and denotational semantics.

**Finite-State Techniques** Stoyan Mihov 2019-08 Covers the whole spectrum of finite-state methods, from theory to practical applications.

**Scalable Techniques for Formal Verification** Sandip Ray 2010-06-17 This book is about formal verification, that is, the use of mathematical reasoning to ensure correct execution of computing systems. With the increasing use of computing systems in safety-critical and security-critical applications, it is becoming increasingly important for our well-being to ensure that those systems execute correctly. Over the last decade, formal verification has made significant headway in the analysis of industrial systems, particularly in the realm of verification of hardware. A key advantage of formal verification is that it provides a mathematical guarantee of their correctness (up to the accuracy of formal models and correctness of reasoning tools). In the process, the analysis can expose subtle design errors. Formal verification is particularly effective in finding corner-case bugs that are difficult to detect through traditional simulation and testing. Nevertheless, and in spite of its promise, the application of formal verification has so far been limited in an industrial design validation tool. One of the difficulties in its large-scale adoption include the following (1) deductive verification using theorem provers often involves expensive and prohibitive manual effort and (2) automated decision procedures (e.g., model checking) can quickly hit the bounds of available time and memory. This book presents recent advances in formal verification techniques and discusses the applicability of the techniques in ensuring the reliability of large-scale systems. We deal with the verification of a range of computing systems, from sequential programs to concurrent protocols and pipelined machines.

**Rippling: Meta-Level Guidance for Mathematical Reasoning** Alan Bundy 2005-06-30 Rippling is a radically new technique for the automation of

mathematical reasoning. It is widely applicable whenever a goal is to be proved from one or more syntactically similar givens. It was originally developed for inductive proofs, where the goal was the induction conclusion and the givens were the induction hypotheses. It has proved to be applicable to a much wider class of tasks, from summing series via analysis to general equational reasoning. The application to induction has especially important practical implications in the building of dependable IT systems, and provides solutions to issues such as the problem of combinatorial explosion. Rippling is the first of many new search control techniques based on formula annotation; some additional annotated reasoning techniques are also described here. This systematic and comprehensive introduction to rippling, and to the wider subject of automated inductive theorem proving, will be welcomed by researchers and graduate students alike.

**Complexity and Dynamics** Wikipedians 2017

*Computational Logic* Dov M. Gabbay 2014-12-09 Handbook of the History of Logic brings to the development of logic the best in modern techniques of historical and interpretative scholarship. Computational logic was born in the twentieth century and evolved in close symbiosis with the advent of the first electronic computers and the growing importance of computer science, informatics and artificial intelligence. With more than ten thousand people working in research and development of logic and logic-related methods, with several dozen international conferences and several times as many workshops addressing the growing richness and diversity of the field, and with the foundational role and importance these methods now assume in mathematics, computer science, artificial intelligence, cognitive science, linguistics, law and many engineering fields where logic-related techniques are used inter alia to state and settle correctness issues, the field has diversified in ways that even the pure logicians working in the early decades of the twentieth century could have hardly anticipated. Logical calculi, which capture an important aspect of human thought, are now amenable to investigation with mathematical rigour and computational support and fertilized the early dreams of mechanised reasoning: "Calculamus". The Dartmouth Conference in 1956 – generally considered as the birthplace of artificial intelligence – raised explicitly the hopes for the new possibilities that the advent of electronic computing machinery offered: logical statements could now be executed on a machine with all the far-reaching consequences that ultimately led to logic programming, deduction systems for mathematics and engineering, logical design and verification of computer software and hardware, deductive databases and software synthesis as well as logical techniques for analysis in the field of mechanical engineering. This volume covers some of the main subareas of computational logic and its applications. Chapters by leading authorities in the field Provides a forum where philosophers and scientists interact Comprehensive reference source on the history of logic

**Computational Logic** Ulrich Berger 2012-12-06 Recent developments in computer science clearly show the need for a better theoretical foundation for some central issues. Methods and results from mathematical logic, in particular proof theory and model theory, are of great help here and will be used much more in future than previously. This book provides an excellent introduction to the interplay of mathematical logic and computer science. It contains extensively reworked versions of the lectures given at the 1997 Marktoberdorf Summer School by leading researchers in the field. Topics covered include: proof theory and specification of computation (J.-Y. Girard, D. Miller), complexity of proofs and programs (S. R. Buss, S. S. Wainer), computational content of proofs (H. Schwichtenberg), constructive type theory (P. Aczel, H. Barendregt, R. L. Constable), computational mathematics, (U. Martin), rewriting logic (J. Meseguer), and game semantics (S. Abramski).

**Gödel's Proof** Ernest Nagel 2018-09-14 In 1931 Kurt Gödel published his paper, "On Formally Undecidable Propositions of Principia Mathematica and Related Systems." Gödel's paper challenged certain basic assumptions underlying much research in mathematics and logic. However, few scholars were unable to understand Gödel's ideas. Ernest Nagel and James Newman provide a readable and accessible explanation of the main ideas and broad implications of Gödel's discovery.

**Information Flow** Jon Barwise 1997-07-28 Information is a central topic in computer science, cognitive science and philosophy. In spite of its importance in the 'information age', there is no consensus on what information is, what makes it possible, and what it means for one medium to carry information about another. Drawing on ideas from mathematics, computer science and philosophy, this book addresses the definition and place of information in society. The authors, observing that information flow is possible only within a connected distribution system, provide a mathematically rigorous, philosophically sound foundation for a science of information. They illustrate their theory by applying it to a wide range of phenomena, from file transfer to DNA, from quantum mechanics to speech act theory.

**Incompleteness** Rebecca Goldstein 2005 A portrait of the eminent twentieth-century mathematician discusses his groundbreaking theorem of incompleteness, contributions within the famous Vienna circle, relationships with such contemporaries as Albert Einstein, and untimely death as a result of mental instability and self-starvation. 30,000 first printing.

**Metamathematics, Machines and Gödel's Proof** N. Shankar 1997-01-30 Describes the use of computer programs to check several proofs in the foundations of mathematics.

**Extensions of First-Order Logic** Maria Manzano 1996-03-29 This book introduces some extensions of classical first-order logic and applies them to reasoning about computer programs. The extensions considered are: second-order logic, many-sorted logic, w-logic, modal logic type theory and dynamic logic. These have wide applications in various areas of computer science, philosophy, natural language processing and artificial intelligence. Researchers in these areas will find this book a useful introduction and comparative treatment.

*Theorem Proving in Higher Order Logics* Joe Hurd 2005-08-29 This volume constitutes the proceedings of the 18th International Conference on Theorem Proving in Higher Order Logics (TPHOLs 2005), which was held during 22–25 August 2005 in Oxford, UK. TPHOLs covers all aspects of theorem proving in higher order logics as well as related topics in theorem proving and verification. There were 49 papers submitted to TPHOLs 2005 in the full research category, each of which was refereed by at least three reviewers selected by the program committee. Of these submissions, 20 research papers and 4 proof pearls were accepted for presentation at the conference and publication in this volume. In keeping with longstanding tradition, TPHOLs 2005 also offered a venue for the presentation of work in progress, where researchers invited discussion by means of a brief introductory talk and then discussed their work at a poster session. A supplementary proceedings volume was published as a 2005 technical report of the Oxford University Computing Laboratory. The organizers are grateful to Wolfgang Paul and Andrew Pitts for agreeing to give invited talks at TPHOLs 2005.

**Scientific Method in Practice** Hugh G. Gauch, Jr. 2003 As the gateway to scientific thinking, an understanding of the scientific method is essential for success and productivity in science. This book is the first synthesis of the practice and the philosophy of the scientific method. It will enable scientists to be better scientists by offering them a deeper understanding of the underpinnings of the scientific method, thereby leading to more productive research and experimentation. It will also give scientists a more accurate perspective on the rationality of the scientific approach and its role in society. Beginning with a discussion of today's 'science wars' and science's presuppositions, the book then explores deductive and inductive logic, probability, statistics, and parsimony, and concludes with an examination of science's powers and limits, and a look at science education. Topics relevant to a variety of disciplines are treated, and clarifying figures, case studies, and chapter summaries enhance the pedagogy. This adeptly executed, comprehensive, yet pragmatic work yields a new synergy suitable for scientists and instructors, and graduate students and advanced undergraduates.

*Handbook of Proof Theory* S.R. Buss 1998-07-09 This volume contains articles covering a broad spectrum of proof theory, with an emphasis on its mathematical aspects. The articles should not only be interesting to specialists of proof theory, but should also be accessible to a diverse audience, including logicians, mathematicians, computer scientists and philosophers. Many of the central topics of proof theory have been included in a self-contained expository of articles, covered in great detail and depth. The chapters are arranged so that the two introductory articles come first; these are then followed by articles from core classical areas of proof theory; the handbook concludes with articles that deal with topics closely related to computer science.

**Basic Proof Theory** A. S. Troelstra 2000-07-27 This introduction to the basic ideas of structural proof theory contains a thorough discussion and comparison of various types of formalization of first-order logic. Examples are given of several areas of application, namely: the metamathematics of pure first-order logic (intuitionistic as well as classical); the theory of logic programming; category theory; modal logic; linear logic; first-order arithmetic and second-order logic. In each case the aim is to illustrate the methods in relatively simple situations and then apply them elsewhere in much more complex settings. There are numerous exercises throughout the text. In general, the only prerequisite is a standard course in first-order logic, making the book ideal for graduate students and beginning researchers in mathematical logic, theoretical computer science and artificial intelligence. For the new edition, many sections have been rewritten to improve clarity, new sections have been added on cut elimination, and solutions to selected exercises have been included.

**Automated Reasoning** Nicola Olivetti 2016-06-13 This book constitutes the refereed proceedings of the 8th International Joint Conference on Automated Reasoning, IJCAR 2016, held in Coimbra, Portugal, in June/July 2016. IJCAR 2014 was a merger of three leading events in automated reasoning, namely CADE (International Conference on Automated Deduction), FroCoS (International Symposium on Frontiers of Combining Systems) and TABLEAUX (International Conference on Automated Reasoning with Analytic Tableaux and Related Methods). The 26 revised full research papers and 9 system descriptions presented together with 4 invited talks were carefully reviewed and selected from 79 submissions. The papers have been organized in topical sections on satisfiability of Boolean formulas, satisfiability modulo theory, rewriting, arithmetic reasoning and mechanizing mathematics, first-order logic and proof theory, first-order theorem proving, higher-order theorem proving, modal and temporal logics, non-classical logics, and verification.

*Concurrency Verification* W.-P. de Roever 2001-11-26 An advanced 2001 textbook on verification of concurrent programs using a semantic approach which highlights concepts clearly.

**Temporal Logics in Computer Science** Stéphane Demri 2016-10-13 This comprehensive text provides a modern and technically precise exposition of the fundamental theory and applications of temporal logics in computer science. Part I presents the basics of discrete transition systems, including constructions and behavioural equivalences. Part II examines the most important temporal logics for transition systems and Part III looks at their expressiveness and complexity. Finally, Part IV describes the main computational methods and decision procedures for model checking and model building - based on tableaux, automata and games - and discusses their relationships. The book contains a wealth of examples and exercises, as well as an extensive annotated bibliography. Thus, the book is not only a solid professional reference for researchers in the field but also a comprehensive graduate textbook that can be used for self-study as well as for teaching courses.

**Mechanizing Proof** Donald MacKenzie 2004-01-30 Most aspects of our private and social lives—our safety, the integrity of the financial system, the functioning of utilities and other services, and national security—now depend on computing. But how can we know that this computing is trustworthy? In Mechanizing Proof, Donald MacKenzie addresses this key issue by investigating the interrelations of computing, risk, and mathematical proof over the last half century from the perspectives of history and sociology. His discussion draws on the technical literature of computer science and artificial intelligence and on extensive interviews with participants. MacKenzie argues that our culture now contains two ideals of proof: proof as traditionally conducted by human mathematicians, and formal, mechanized proof. He describes the systems constructed by those committed to the latter ideal and the many questions those systems raise about the nature of proof. He looks at the primary social influence on the development of automated proof—the need to predict the behavior of the computer systems upon which human life and security depend—and explores the involvement of powerful organizations such as the National Security Agency. He concludes that in mechanizing proof, and in pursuing dependable computer systems, we do not obviate the need for trust in our collective human judgment.

**Grace Unlimited** Clark H. Pinnock 1999-04-20 This book considers the universality of grace and presupposes that God is just in an unqualified manner, desiring the salvation of all sinners. The writers examine the concepts of faith, election and predestination and argue against the position that some people are predestinated for eternal life or everlasting death.

*In the Light of Logic* Solomon Feferman 1998-11-19 In this collection of essays written over a period of twenty years, Solomon Feferman explains advanced results in modern logic and employs them to cast light on significant problems in the foundations of mathematics. Most troubling among these is the revolutionary way in which Georg Cantor elaborated the nature of the infinite, and in doing so helped transform the face of twentieth-century mathematics. Feferman details the development of Cantorian concepts and the foundational difficulties they engendered. He argues that the freedom provided by Cantorian set theory was purchased at a heavy philosophical price, namely adherence to a form of mathematical platonism that is difficult to support. Beginning with a previously unpublished lecture for a general audience, Deciding the Undecidable, Feferman examines the famous list of twenty-three mathematical problems posed by David Hilbert, concentrating on three problems that have most to do with logic. Other chapters are devoted to the work and thought of Kurt Gödel, whose stunning results in the 1930s on the incompleteness of formal systems and the consistency of Cantors continuum hypothesis have been of utmost importance to all subsequent work in logic. Though Gödel has been identified as the leading defender of set-theoretical platonism, surprisingly even he at one point regarded it as unacceptable. In his concluding chapters, Feferman uses tools from the special part of logic called proof theory to explain how the vast part—if not all—of scientifically applicable mathematics can be justified on the basis of purely arithmetical principles. At least to that extent, the question raised in two of the essays of the volume, Is Cantor Necessary?, is answered with a resounding no. This volume of important and influential work by one of the leading figures in logic and the foundations of mathematics is essential reading for anyone interested in these subjects.