Mathematics Das Paul

Historian David E. Rowe captures the rich tapestry of mathematical creativity in this collection of essays from the “Years Ago” column of The Mathematical Intelligencer. With topics ranging from ancient Greek mathematics to modern relativistic cosmology, this collection conveys the impetus and spirit of Rowe’s various and many-faceted contributions to the history of mathematics. Centered on the Göttingen mathematical tradition, these stories illuminate important facets of mathematical activity often overlooked in other accounts. Six sections place the essays in chronological and thematic order, beginning with new introductions that contextualize each section. The essays that follow recount episodes relating to the section’s overall theme. All of the essays in this collection, with the exception of two, appeared over the course of more than 30 years in The Mathematical Intelligencer. Based largely on archival and primary sources, these vignettes offer unusual insights into behind-the-scenes events. Taken together, they aim to show how Göttingen managed to attract an extraordinary array of talented individuals, several of whom contributed to the development of a new mathematical culture during the first decades of the twentieth century.

This book examines the historically unique

conditions under which the International Congress of Mathematicians took place in Oslo in 1936. This Congress was the only one on this level to be held during the period of the Nazi regime in Germany (1933–1945) and after the wave of emigrations from it. Relying heavily on unpublished archival sources, the authors consider the different goals of the various participants in the Congress, most notably those of the Norwegian organizers, and the Nazi-led German delegation. They also investigate the reasons for the absence of the proposed Soviet and Italian delegations. In addition, aiming to shed light onto the mathematical dimension of the Congress, the authors provide overviews of the nineteen plenary presentations, as well as their planning and development. Biographical information about each of the plenary speakers rounds off the picture. The Oslo Congress, the first at which Fields Medals were awarded, is used as a lens through which the reader of this book can view the state of the art of mathematics in the mid-1930s.

This work provides an overview of attempts to assess the current condition of the concept of creation order within reformational philosophy compared to other perspectives. Focusing on the natural and life sciences, and theology, this first volume of two examines the arguments for and against the beauty, coherence and order shown in the natural world being related to the will or nature of

a Creator. It examines the decay of a Deist universe, and the idea of the pre-givenness of norms, laws and structures as challenged by evolutionary theory and social philosophy. It describes the different responses to the collapse of order: that given by Christian philosophy scholars who still argue for the idea of a pre-given world order, and that of other scholars who see this idea of stable creation order and/or natural law as redundant and in need of a thorough rethinking. It studies the particular role that reformational philosophy has played in the discussion. It shows how, ever since its inception, almost a century ago, the concepts of order and law (principle, structure) have been at the heart of this philosophy, and that one way to characterise this tradition is as a philosophy of creation order. Reformational philosophers have maintained the notion of law as ‘holding’ for reality. This book discusses the questions that have arisen about the nature of such law: is it a religious or philosophical concept; does law just mean ‘orderliness’? How does it relate to laws of nature? Have they always existed or do they ‘emerge’ during the process of evolution?

The twentieth century witnessed the birth of analytic philosophy. This volume covers some of its key movements and philosophers, including Frege and Wittgenstein's Tractatus.

Abraham A. Fraenkel was a world-renowned

mathematician in pre–Second World War Germany, whose work on set theory was fundamental to the development of modern mathematics. A friend of Albert Einstein, he knew many of the era's acclaimed mathematicians personally. He moved to Israel (then Palestine under the British Mandate) in the early 1930s. In his autobiography Fraenkel describes his early years growing up as an Orthodox Jew in Germany and his development as a mathematician at the beginning of the twentieth century. ?This memoir, originally written in German in the 1960s, has now been translated into English, with an additional chapter covering the period from 1933 until his death in 1965 written by the editor, Jiska Cohen-Mansfield. Fraenkel describes the world of mathematics in Germany in the first half of the twentieth century, its origins and development, the systems influencing it, and its demise. He also paints a unique picture of the complex struggles within the world of Orthodox Jewry in Germany. In his personal life, Fraenkel merged these two worlds during periods of turmoil including the two world wars and the establishment of the state of Israel. Including a new foreword by Menachem Magidor Foreword to the 1967 German edition by Yehoshua Bar-Hillel Solomon Feferman has shaped the field of foundational research for nearly half a century. These papers, most of which were presented at the symposium honoring him at his 70th birthday, reflect

his broad interests as well as his approach to foundational research, which places the solution of mathematical and philosophical problems at the top of his agenda. The contributions range from historical to technical to philosophical topics, with emphasis on proof theory and computational aspects.

50 essays by eminent scholars include meditations on "Structures," Disciplines," "Space," "Function," "Group," "Probability," and "The Mathematical Epic" (Volume I) and on "Mathematics and the Human Intellect," "Mathematics and Technology," and "Mathematics and Civilization" (Volume II). 1962 edition.

In this book, the author discusses a modern concept of general education that then helps to clarify both curricular and pedagogical deficits involved in conventional mathematics instruction. It provides an outline of an alternative mathematics instruction that can help to realize a general education and presents detailed arguments for seven interconnected objectives of a school system aiming at general education.

Drawing on the empirical findings generated by researchers in science studies, and adopting Kropotkin's concept of anarchism as one of the social sciences, Red, Black, and Objective expounds and develops an anarchist account of science as a social construction and social institution. Restivo's account is at once normative,

analytical, organizational, and policy oriented, in particular with respect to education. With attention to the social practices and discourse of science, this book engages with the works of Feyerabend and Nietzsche, as well as philosophers and historians of objectivity to ground an anarchistic sociology of science. Marx and Durkheim figure prominently in this account as precursors of the contemporary science studies perspective on the perennial question, "What is science?" The result is an approach to understanding the science-and-society nexus that is at once an extension of Restivo's earlier work and a novel adaptation of the anarchist agenda. Red, Black, and Objective is an exploration by one of the founders of the science studies movement of questions in theory, practice, values, and policy. As such, it will appeal to those with interests in science and technology studies, social theory, and sociology and philosophy of science and technology.
The book provides an overview of state-of-the-art research from Brazil and Germany in the field of inclusive mathematics education. Originated from a research cooperation between two countries where inclusive education in mathematics has been a major challenge, this volume seeks to make recent research findings available to the international community of mathematics teachers and researchers. In the book, the authors cover a wide variety of special needs that learners of mathematics may have in inclusive settings. They present theoretical frameworks and methodological approaches for research and practice.
From Foundations to Philosophy of Mathematics

provides an historical introduction to the most exciting period in the foundations of mathematics, starting with the discovery of the paradoxes of logic and set theory at the beginning of the twentieth century and continuing with the great foundational debate that took place in the 1920s. As a result of the efforts of several mathematicians and philosophers during this period to ground mathematics and to clarify its nature from a certain philosophical standpoint, the four main schools in the philosophy of mathematics that have largely dominated the twentieth century arose, namely, logicism, intuitionism, formalism and predicativism. It was due precisely to the insufficiencies of the first three foundational programs and the objections raised against them, that interest in Platonism was renewed in the 1940s, mainly by Gödel. Not only does this book pay special attention to the foundational programs of these philosophies of mathematics, but also to some technical accomplishments that were developed in close connection with them and have largely shaped our understanding of the nature of mathematics, such as Russell's type theory, Zermelo's set theory and Gödel's incompleteness theorems. Finally, it also examines some current research programs that have been pursued in the last decades and have tried, at least to some extent, to show the feasibility of the foundational programs developed in the schools mentioned above. This is the case of neologicism, constructivism, and predicativist and finitist reductionism, this last one developed closely with the research program of reverse mathematics.

This book addresses the historiography of mathematics as it was practiced during the 19th and 20th centuries by paying special attention to the cultural contexts in which the history of mathematics was written. In the 19th century, the history of mathematics was recorded by a diverse range of people trained in various fields and driven by different motivations and aims. These backgrounds often shaped not only their writing on the history of mathematics, but, in some instances, were also influential in their subsequent reception. During the period from roughly 1880-1940, mathematics modernized in important ways, with regard to its content, its conditions for cultivation, and its identity; and the writing of the history of mathematics played into the last part in particular. Parallel to the modernization of mathematics, the history of mathematics gradually evolved into a field of research with its own journals, societies and academic positions. Reflecting both a new professional identity and changes in its primary audience, various shifts of perspective in the way the history of mathematics was and is written can still be observed to this day. Initially concentrating on major internal, universal developments in certain sub-disciplines of mathematics, the field gradually gravitated towards a focus on contexts of knowledge production involving individuals, local practices, problems, communities, and networks. The goal of this book is to link these disciplinary and methodological changes in the history of mathematics to the broader cultural contexts of its practitioners, namely the historians of mathematics during the period in question.

A Dingo Ate My Math Book presents ingenious, unusual, and beautiful nuggets of mathematics with a distinctly Australian flavor. It focuses, for example, on Australians' love of sports and gambling, and on Melbourne's iconic, mathematically inspired architecture. Written in a playful and humorous style, the book offers mathematical entertainment as well as a glimpse of Australian culture for the mathematically curious of all ages. This collection of engaging stories was extracted from the Maths Masters column that ran from 2007 to 2014 in Australia's Age newspaper. The maths masters in question are Burkard Polster and Marty Ross, two (immigrant) Aussie mathematicians, who each week would write about math in the news, providing a new look at old favorites, mathematical history, quirks of school mathematics—whatever took their fancy. All articles were written for a very general audience, with the intention of being as inviting as possible and assuming a minimum of mathematical background.

The Mathematics of the Heavens and the Earth is the first major history in English of the origins and early development of trigonometry. Glen Van Brummelen identifies the earliest known trigonometric precursors in ancient Egypt, Babylon, and Greece, and he examines the revolutionary discoveries of Hipparchus, the Greek astronomer believed to have been the first to make systematic use of trigonometry in the second century BC while studying the motions of the stars. The book traces trigonometry's development into a full-fledged mathematical discipline in India and Islam; explores its applications to such areas as geography and seafaring

navigation in the European Middle Ages and Renaissance; and shows how trigonometry retained its ancient roots at the same time that it became an important part of the foundation of modern mathematics. The Mathematics of the Heavens and the Earth looks at the controversies as well, including disputes over whether Hipparchus was indeed the father of trigonometry, whether Indian trigonometry is original or derived from the Greeks, and the extent to which Western science is indebted to Islamic trigonometry and astronomy. The book also features extended excerpts of translations of original texts, and detailed yet accessible explanations of the mathematics in them. No other book on trigonometry offers the historical breadth, analytical depth, and coverage of non-Western mathematics that readers will find in The Mathematics of the Heavens and the Earth.

As an historiographic monograph, this book offers a detailed survey of the professional evolution and significance of an entire discipline devoted to the history of science. It provides both an intellectual and a social history of the development of the subject from the first such effort written by the ancient Greek author Eudemus in the Fourth Century BC, to the founding of the international journal, Historia Mathematica, by Kenneth O. May in the early 1970s.

In these selected essays, Charles Parsons surveys the contributions of philosophers and mathematicians who shaped the philosophy of mathematics over the past century: Brouwer, Hilbert, Bernays, Weyl, Gödel, Russell, Quine, Putnam, Wang, and Tait.

This book provides an exciting history of the discovery of Ramsey Theory, and contains new research along with rare photographs of the mathematicians who developed this theory, including Paul Erdös, B.L. van der Waerden, and Henry Baudet.

A companion publication to the international exhibition "Transcending Tradition: Jewish Mathematicians in German-Speaking Academic Culture", the catalogue explores the working lives and activities of Jewish mathematicians in German-speaking countries during the period between the legal and political emancipation of the Jews in the 19th century and their persecution in Nazi Germany. It highlights the important role Jewish mathematicians played in all areas of mathematical culture during the Wilhelmine Empire and the Weimar Republic, and recalls their emigration, flight or death after 1933.

The main item in the present volume was published in 1930 under the title Das Unendliche in der Mathematik und seine Ausschaltung. It was at that time the fullest systematic account from the standpoint of Husserl's phenomenology of what is known as 'finitism' (also as 'intuitionism' and 'constructivism') in mathematics. Since then, important changes have been required in philosophies of mathematics, in part because of Kurt Godel's epoch-making paper of 1931 which established the essential in completeness of arithmetic. In the light of that finding, a number of the claims made in the book (and in the accompanying articles) are demon strably mistaken. Nevertheless, as a whole it retains much of its original interest and value. It presents the issues in the

foundations of mathematics that were under debate when it was written (and in some cases still are); , and it offers one alternative to the currently dominant set-theoretical definitions of the cardinal numbers and other arithmetical concepts. While still a student at the University of Vienna, Felix Kaufmann was greatly impressed by the early philosophical writings (especially by the Logische Untersuchungen) of Edmund Husser!' He was never an uncritical disciple of Husserl, and he integrated into his mature philosophy ideas from a wide assortment of intellectual sources. But he thought of himself as a phenomenologist, and made frequent use in all his major publications of many of Husserl's logical and epistemological theses.

This edited volume, aimed at both students and researchers in philosophy, mathematics and history of science, highlights leading developments in the overlapping areas of philosophy and the history of modern mathematics. It is a coherent, wide ranging account of how a number of topics in the philosophy of mathematics must be reconsidered in the light of the latest historical research, and how a number of historical accounts can be deepened by embracing philosophical questions.

In this book, first published in 2003, categorical algebra is used to build a foundation for the study of geometry, analysis, and algebra.

This book brings together for the first time the Kenneth May Lectures that were given at the annual meetings of the Canadian Society for History and Philosophy of Mathematics. All contributions are of high scholarly

value, yet accessible to an audience with a wide range of interests. They provide a historian's perspective on mathematical developments and deal with a variety of topics covering Greek applied mathematics, the mathematics and science of Leonhard Euler, mathematical modeling and phenomena in ancient astronomy, Turing and the origins of artificial intelligence to name only a few.

Albert Lautman (1908-1944) was a French philosopher of mathematics whose work played a crucial role in the history of contemporary French philosophy. His ideas have had an enormous influence on key contemporary thinkers including Gilles Deleuze and Alain Badiou, for whom he is a major touchstone in the development of their own engagements with mathematics. Mathematics, Ideas and the Physical Real presents the first English translation of Lautman's published works between 1933 and his death in 1944. Rather than being preoccupied with the relation of mathematics to logic or with the problems of foundation, which have dominated philosophical reflection on mathematics, Lautman undertakes to develop an understanding of the broader structure of mathematics and its evolution. The two powerful ideas that are constants throughout his work, and which have dominated subsequent developments in mathematics, are the concept of mathematical structure and the idea of the essential unity underlying the apparent multiplicity of mathematical disciplines. This collection of his major writings offers readers a much-needed insight into his influence on the development of mathematics and philosophy.

The present book is an introduction to the philosophy of mathematics. It asks philosophical questions concerning fundamental concepts, constructions and methods - this is done from the standpoint of mathematical research and teaching. It looks for answers both in mathematics and in the philosophy of mathematics from their beginnings till today. The reference point of the considerations is the introducing of the reals in the 19th century that marked an epochal turn in the foundations of mathematics. In the book problems connected with the concept of a number, with the infinity, the continuum and the infinitely small, with the applicability of mathematics as well as with sets, logic, provability and truth and with the axiomatic approach to mathematics are considered. In Chapter 6 the meaning of infinitesimals to mathematics and to the elements of analysis is presented. The authors of the present book are mathematicians. Their aim is to introduce mathematicians and teachers of mathematics as well as students into the philosophy of mathematics. The book is suitable also for professional philosophers as well as for students of philosophy, just because it approaches philosophy from the side of mathematics. The knowledge of mathematics needed to understand the text is elementary. Reports on historical conceptions. Thinking about today‘s mathematical doing and thinking. Recent developments. Based on the third, revised German edition. For mathematicians - students, teachers, researchers and lecturers - and readersinterested in mathematics and philosophy. Contents On the way to the reals On the history of the philosophy of mathematics

On fundamental questions of the philosophy of mathematics Sets and set theories Axiomatic approach and logic Thinking and calculating infinitesimally – First nonstandard steps Retrospection

This book focuses on some of the major developments in the history of contemporary (19th and 20th century) mathematics as seen in the broader context of the development of science and culture. Avoiding technicalities, it displays the breadth of contrasting images of mathematics favoured by different countries, schools and historical movements, showing how the conception and practice of mathematics changed over time depending on the cultural and national context. Thus it provides an original perspective for embracing the richness and variety inherent in the development of mathematics. Attention is paid to the interaction of mathematics with themes whose proper treatment have been neglected by the traditional historiography of the discipline, such as the relationship between mathematics, statistics and medicine.

An insightful reflection on the mathematical soul What do pure mathematicians do, and why do they do it? Looking beyond the conventional answers—for the sake of truth, beauty, and practical applications—this book offers an eclectic panorama of the lives and values and hopes and fears of mathematicians in the twenty-first century, assembling material from a startlingly diverse assortment of scholarly, journalistic, and pop culture sources. Drawing on his personal experiences and obsessions as well as the thoughts and opinions of mathematicians from Archimedes and Omar Khayyám to such contemporary giants as Alexander Grothendieck and Robert Langlands, Michael Harris reveals the charisma and romance of mathematics as well as its darker side. In this portrait of mathematics as a community united around a set of common intellectual, ethical, and

existential challenges, he touches on a wide variety of questions, such as: Are mathematicians to blame for the 2008 financial crisis? How can we talk about the ideas we were born too soon to understand? And how should you react if you are asked to explain number theory at a dinner party? Disarmingly candid, relentlessly intelligent, and richly entertaining, Mathematics without Apologies takes readers on an unapologetic guided tour of the mathematical life, from the philosophy and sociology of mathematics to its reflections in film and popular music, with detours through the mathematical and mystical traditions of Russia, India, medieval Islam, the Bronx, and beyond.

This book provides a self-contained introduction to modern set theory and also opens up some more advanced areas of current research in this field. The first part offers an overview of classical set theory wherein the focus lies on the axiom of choice and Ramsey theory. In the second part, the sophisticated technique of forcing, originally developed by Paul Cohen, is explained in great detail. With this technique, one can show that certain statements, like the continuum hypothesis, are neither provable nor disprovable from the axioms of set theory. In the last part, some topics of classical set theory are revisited and further developed in the light of forcing. The notes at the end of each chapter put the results in a historical context, and the numerous related results and the extensive list of references lead the reader to the frontier of research. This book will appeal to all mathematicians interested in the foundations of mathematics, but will be of particular use to graduates in this field.

The book "Foundational Theories of Classical and Constructive Mathematics" is a book on the classical topic of foundations of mathematics. Its originality resides mainly in its treating at the same time foundations of classical and foundations of constructive mathematics. This confrontation

of two kinds of foundations contributes to answering questions such as: Are foundations/foundational theories of classical mathematics of a different nature compared to those of constructive mathematics? Do they play the same role for the resp. mathematics? Are there connections between the two kinds of foundational theories? etc. The confrontation and comparison is often implicit and sometimes explicit. Its great advantage is to extend the traditional discussion of the foundations of mathematics and to render it at the same time more subtle and more differentiated. Another important aspect of the book is that some of its contributions are of a more philosophical, others of a more technical nature. This double face is emphasized, since foundations of mathematics is an eminent topic in the philosophy of mathematics: hence both sides of this discipline ought to be and are being paid due to.

During the last few decades historians of science have shown a growing interest in science as a cultural activity and have regarded science more and more as part of the gene ral developments that have occurred in society. This trend has been less evident arnong historians of mathematics, who traditionally concentrate primarily on tracing the develop ment of mathematical knowledge itself. To some degree this restriction is connected with the special role of mathematics compared with the other sciences; mathematics typifies the most objective, most coercive type of knowledge, and there fore seems to be least affected by social influences. Nevertheless, biography, institutional history and his tory of national developments have long been elements in the historiography of mathematics. This interest in the social aspects of mathematics has widened recently through the stu dy of other themes, such as the relation of mathematics to the development of the educational system. Some scholars have begun to apply the methods of historical sociology of

knowledge to mathematics; others have attempted to give a ix x Marxist analysis of the connection between mathematics and productive forces, and there have been philosophical studies about the communication processes involved in the production of mathematical knowledge. An interest in causal analyses of historical processes has led to the study of other factors influencing the development of mathematics, such as the f- mation of mathematical schools, the changes in the profes- onal situation of the mathematician and the general cultural milieu of the mathematical scientist.

Charles Parsons examines the notion of object, with the aim to navigate between nominalism, denying that distinctively mathematical objects exist, and forms of Platonism that postulate a transcendent realm of such objects. He introduces the central mathematical notion of structure and defends a version of the structuralist view of mathematical objects, according to which their existence is relative to a structure and they have no more of a 'nature' than that confers on them. Parsons also analyzes the concept of intuition and presents a conception of it distantly inspired by that of Kant, which describes a basic kind of access to abstract objects and an element of a first conception of the infinite.

What is the source of logical and mathematical truth? This volume revitalizes conventionalism as an answer to this question. Conventionalism takes logical and mathematical truth to have their source in linguistic conventions. This was an extremely popular view in the early 20th century, but it was never worked out in detail and is now almost universally rejected in mainstream philosophical circles. In Shadows of Syntax, Jared Warren offers the first book-length treatment and defense of a combined conventionalist theory of logic and mathematics. He argues that our conventions, in the form of syntactic rules of language use, are perfectly suited to

explain the truth, necessity, and a priority of logical and mathematical claims. In Part I, Warren explains exactly what conventionalism amounts to and what linguistic conventions are. Part II develops an unrestricted inferentialist theory of the meanings of logical constants that leads to logical conventionalism. This conventionalist theory is elaborated in discussions of logical pluralism, the epistemology of logic, and of the influential objections that led to the historical demise of conventionalism. Part III aims to extend conventionalism from logic to mathematics. Unlike logic, mathematics involves both ontological commitments and a rich notion of truth that cannot be generated by any algorithmic process. To address these issues Warren develops conventionalist-friendly but independently plausible theories of both metaontology and mathematical truth. Finally, Part IV steps back to address big picture worries and meta-worries about conventionalism. This book develops and defends a unified theory of logic and mathematics according to which logical and mathematical truths are reflections of our linguistic rules, mere shadows of syntax.

The nineteenth century saw a movement to make higher mathematics rigorous. This seemed to be on the brink of success when it was thrown into confusion by the discovery of the class paradoxes. That initiated a period of intense research into the foundations of mathematics, and with it the birth of mathematical logic and a new, sharper debate in the philosophy of mathematics. The Search for Certainty examines this foundational endeavour from the discovery of the paradoxes to the present. Focusing on Russell's logicist programme and Hilbert's finitist programme, Giaquinto investigates how successful they were and how successful they could be. These questions are set in the context of a clear, non-technical exposition and assessment of the most important discoveries in mathematical logic, above all

G--ouml--;del's underivability theorems. More than six decades after those discoveries, Giaquinto asks what our present perspective should be on the question of certainty in mathematics. Taking recent developments into account, he gives reasons for a surprisingly positive response.

The book is part biography and part collection of mathematical essays that gives the reader a perspective on the evolution of an interesting mathematical life. It is all about Lipman Bers, a giant in the mathematical world who lived in turbulent and exciting times. It captures the essence of his mathematics, a development and transition from applied mathematics to complex analysis--quasiconformal mappings and moduli of Riemann surfaces--and the essence of his personality, a progression from a young revolutionary refugee to an elder statesman in the world of mathematics and a fighter for global human rights and the end of political torture. The book contains autobiographical material and short reprints of his work. The main content is in the exposition of his research contributions, sometimes with novel points of view, by students, grand-students, and colleagues. The research described was fundamental to the growth of a central part of 20th century mathematics that, now in the 21st century, is in a healthy state with much current interest and activity. The addition of personal recollections, professional tributes, and photographs yields a picture of a man, his personal and professional family, and his time.

Imagine mathematics, imagine with the help of mathematics, imagine new worlds, new geometries, new forms. Imagine building mathematical models that make

it possible to manage our world better, imagine solving great problems, imagine new problems never before thought of, imagine combining music, art, poetry, literature, architecture, theatre and cinema with mathematics. Imagine the unpredictable and sometimes counterintuitive applications of mathematics in all areas of human endeavour. This seventh volume starts with a homage to the Italian artist Mimmo Paladino who created exclusively for the Venice Conference 2019 ten original and unique works of art paper dedicated to the themes of the meeting. A large section is dedicated to the most recent Fields Medals including a Homage to Maryam Mirzakhani including a presentation of the exhibition on soap bubbles in art and science that took place in 2019. A section is dedicated to cinema and theatre including the performances by Claire Bardainne & Adrien Mondot. A part of the conference focused on the community of mathematicians, their role in literature and even in politics with the extraordinary example of Antanas Mockus Major of Bogotá. Mathematics in the constructions of bridges, in particular in Italy in the Sixties was presented by Tullia Iori. A very particular contribution on Origami by a mathematician, Marco Abate and an artist, Alessandro Beber. And many other topics. As usual the topics are treated in a way that is rigorous but captivating, detailed and full of evocations. This is an all-embracing look at the world of mathematics and culture. The world, life, culture, everything has changed in a few weeks with the Coronavirus. Culture, science are the main ways to safeguard people's physical and social life. Trust in humanity's creativity and

ability. The motto today in Italy is Everything will be fine. This work is addressed to all those who have an interest in Mathematics.

This book tells the story of Wittgenstein interpretation during the past eighty years. It provides different interpretations, chronologies, developments, and controversies. It aims to discover the motives and motivations behind the philosophical community's project of interpreting Wittgenstein. It will prove valuable to philosophers, scholars, interpreters, students, and specialists, in both analytic and continental philosophy.

This book grew out of a graduate student paper [261] in which I set down some criticisms of J. R. Lucas' attempt to refute mechanism by means of G6del's theorem. I had made several such abortive attempts myself and had become familiar with their pitfalls, and especially with the double edged nature of incompleteness arguments. My original idea was to model the refutation of mechanism on the almost universally accepted G6delian refutation of Hilbert's formalism, but I kept getting stuck on questions of mathematical philosophy which I found myself having to beg. A thorough study of the foundational works of Hilbert and Bernays finally convinced me that I had all too naively and uncritically bought this refutation of formalism. I did indeed discover points of surprisingly close contact between formalism and mechanism, but also that it was possible to under mine certain strong arguments against these positions precisely by invok ing G6del's and related work. I also began to realize that the Church Turing thesis itself is the principal bastion protecting mechanism, and that G6del's work was

perhaps the best thing that ever happened to both mechanism and formalism. I pushed these lines of argument in my dis sertation with the patient help of my readers, Raymond Nelson and Howard Stein. I would especially like to thank the latter for many valuable criticisms of my dissertation as well as some helpful suggestions for reor ganizing it in the direction of the present book.