Astronomical Cuneiform Texts

There is a nineteen-year recurrence in the apparent position of the sun and moon against the background of the stars, a pattern observed long ago by the Babylonians. In the course of those nineteen years the Earth experiences 235 lunar
cycles. Suppose we calculate the ratio of Earth's period about the sun to the moon's period about Earth. That ratio has 235/19 as one of its early continued fraction convergents, which explains the apparent periodicity. Exploring Continued Fractions explains this and other recurrent phenomena—astronomical transits and conjunctions, lifecycles of cicadas, eclipses—by way of continued fraction expansions. The deeper purpose is to find patterns, solve puzzles, and discover some appealing number theory. The reader will explore several algorithms for computing continued fractions, including some new to the literature. He or she will also explore the surprisingly large portion of number theory connected to continued fractions: Pythagorean triples, Diophantine equations, the Stern-Brocot tree, and a number of combinatorial sequences. The book features a pleasantly discursive style with excursions into music (The Well-Tempered Clavier), history (the Ishango bone and Plimpton 322), classics (the shape of More's Utopia) and whimsy (dropping a black hole on Earth's surface). Andy Simoson has won both the Chauvenet Prize and Pólya Award for expository writing from the MAA and his Voltaire's Riddle was a Choice magazine Outstanding Academic Title. This book is an enjoyable ramble through some beautiful mathematics. For most of the journey the only necessary prerequisites are a minimal familiarity with mathematical reasoning and a sense of fun.

**Mathematics, Administrative and Economic Activities in Ancient Worlds**

This contributed volume investigates the active role of the different contexts of mathematics teaching on the evolution of the practices of mathematical concepts, with particular focus on their foundations. The book aims to deconstruct the strong and generally wide-held conviction that research in mathematics constitutes the only driving force for any progress in the development of mathematics as a field. In compelling and convincing contrast, these chapters aim to show the productive function of teaching, showcasing investigations from countries and regions throughout various eras, from Old Babylonia through the 20th Century. In so doing, they provide a critical reflection on the foundations of mathematics, as well as instigate new research questions, and explore the interfaces between teaching and research.

**Historiography of Mathematics in the 19th and 20th Centuries**
Mathematics in Ancient Egypt

This monograph presents in great detail a large number of both unpublished and previously published Babylonian mathematical texts in the cuneiform script. It is a continuation of the work A Remarkable Collection of Babylonian Mathematical Texts (Springer 2007) written by Jöran Friberg, the leading expert on Babylonian mathematics. Focussing on the big picture, Friberg explores in this book several Late Babylonian arithmetical and metro-mathematical table texts from the sites of Babylon, Uruk and Sippar, collections of mathematical exercises from four Old Babylonian sites, as well as a new text from Early Dynastic/Early Sargonic Umma, which is the oldest known collection of mathematical exercises. A table of reciprocals from the end of the third millennium BC, differing radically from well-documented but younger tables of reciprocals from the Neo-Sumerian and Old-Babylonian periods, as well as a fragment of a Neo-Sumerian clay tablet showing a new type of a labyrinth are also discussed. The material is presented in the form of photos, hand copies, transliterations and translations, accompanied by exhaustive explanations. The previously unpublished mathematical cuneiform texts presented in this book were discovered by Farouk Al-Rawi, who also made numerous beautiful hand copies of most of the clay tablets. Historians of mathematics and the Mesopotamian civilization, linguists and those interested in ancient labyrinths will find New Mathematical Cuneiform Texts particularly valuable. The book contains many texts of previously unknown types and material that is not available elsewhere.

A History of Ancient Mathematical Astronomy

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Scholars and Scholarship in Late Babylonian Uruk

A new and unique way of understanding the translation of concepts and natural language into mathematical expressions. Transforming a body of text into corresponding mathematical expressions and models is traditionally viewed and taught as a mathematical problem; it is also a task that most find difficult. The Language of Mathematics: Utilizing Math in Practice reveals a new way to view this process—not as a mathematical problem, but as a translation, or language, problem. By presenting the language of mathematics explicitly and systematically, this book helps readers to learn mathematics and improve their ability to apply mathematics more efficiently and effectively to practical problems in their own work. Using parts of speech to identify variables and functions in a mathematical model is a new approach, as is the insight that examining aspects of grammar is highly useful when formulating a corresponding mathematical model. This book identifies the basic elements of the language of mathematics, such as values, variables, and functions, while presenting the grammatical rules for combining them into expressions and other structures. The author describes and defines different notational forms for expressions, and also identifies the relationships between parts of speech and other grammatical elements in English and components of expressions in the language of mathematics. Extensive examples are used throughout that cover a wide range of real-world problems and feature diagrams and tables to facilitate understanding. The Language of Mathematics is a thought-provoking book of interest for readers who would like to learn more about the linguistic nature and aspects of mathematical notation. The book also serves as a valuable supplement for engineers, technicians, managers, and consultants who would like to improve their ability to apply mathematics
effectively, systematically, and efficiently to practical problems.

Exploring Continued Fractions: From the Integers to Solar Eclipses

A complete history of pi from the dawn of mathematical time to the present. The story of pi reflects the most seminal, the most serious and sometimes the silliest aspects of mathematics. Pi is one of the few concepts in mathematics whose mention evokes a response of recognition and interest in those not concerned professionally with the subject. Yet, despite this, no source book on pi has been published until now. One of the beauties of this subject is that it allows for the inclusion of very modern, yet still accessible, mathematics. Mathematicians and historians of mathematics will find this book indispensable, while teachers at every level from the seventh grade onward will find ample resources for anything from special topic courses to individual talks and special student projects. Following a selection of the mathematical literature over four millennia, the book covers a variety of historical writings on the cultural meaning and significance of the number, and the whole is rounded off by a number of treatments on pi that are fanciful, satirical and/or whimsical.

Interfaces between Mathematical Practices and Mathematical Education

The Making of a Scribe

Mesopotamian mathematics is known from a great number of cuneiform texts, most of them Old Babylonian, some Late Babylonian or pre-Old-Babylonian, and has been intensively studied during the last couple of decades. In contrast to this Egyptian mathematics is known from only a small number of papyrus texts, and the few books and papers that have been written about Egyptian mathematical papyri have mostly reiterated the same old presentations and interpretations of the texts. In this book, it is shown that the methods developed by the author for the close study of mathematical cuneiform texts can also be successfully applied to all kinds of individual Egyptian mathematical exercises with Babylonian parallels.
yield many new insights into the nature of Egyptian mathematics and show that Egyptian and Babylonian mathematics display greater similarities than expected. Contents: Two Curious Mathematical Cuneiform Texts from Old Babylonian Mari Hieratic Mathematical Papyri and Cuneiform Mathematical Texts Demotic Mathematical Papyri and Cuneiform Mathematical Texts Greek-Egyptian Mathematical Documents and Cuneiform Mathematical Texts

Readership: Mathematicians, historians of science, egyptologists and assyriologists. Keywords: Babylonian Mathematics; Egyptian Mathematics; Greek Mathematics; Mathematical Cuneiform Texts; Mathematical Papyri; Ancient Mathematics; Early Mathematics; History of Mathematics; Demotic Texts; Hieratic Texts

Key Features: Extensive surveys of known Egyptian mathematical texts New interpretations of particularly difficult Egyptian or Babylonian mathematical exercises Many detailed diagrams and figures, using computer-aided methods of presentations Interesting observations of experiments with new ways of representing fractions in demotic and Greek-Egyptian mathematical texts

Mathematical Cuneiform Texts

The present volume collects eighteen essays exploring the history of ancient Near Eastern studies. Combining diverse approaches—synthetic and analytic, diachronic and transnational—this collection offers critical reflections on the who, why, and how of this cluster of fields. How have political contexts determined the conduct of research? How do academic agendas reflect larger social, economic, and cultural interests? How have schools of thought and intellectual traditions configured, and sometimes predetermined, the study of the ancient Near East? Contributions treating research during the Nazi and fascist periods examine the interpenetration of academic work with politics, while contributions dealing with specific national contexts disclose fresh perspectives on individual scholars as well as the conditions and institutions in which they worked. Particular attention is given to scholarship in countries such as Turkey, Portugal, Iran, China, and Spain, which have hitherto been marginal to historiographic accounts of ancient Near Eastern studies.

Translation as Scholarship

The sequel to Unexpected Links Between Egyptian and Babylonian Mathematics (World Scientific, 2005), this book is
based on the author's intensive and groundbreaking studies of the long history of Mesopotamian mathematics, from the late 4th to the late 1st millennium BC. It is argued in the book that several of the most famous Greek mathematicians appear to have been familiar with various aspects of Babylonian “metric algebra,” a convenient name for an elaborate combination of geometry, metrology, and quadratic equations that is known from both Babylonian and pre-Babylonian mathematical clay tablets. The book's use of “metric algebra diagrams” in the Babylonian style, where the side lengths and areas of geometric figures are explicitly indicated, instead of wholly abstract “lettered diagrams” in the Greek style, is essential for an improved understanding of many interesting propositions and constructions in Greek mathematical works. The author's comparisons with Babylonian mathematics also lead to new answers to some important open questions in the history of Greek mathematics.

Unexpected Links between Egyptian and Babylonian Mathematics

How do Documents Become Sources? Perspectives from Asia and Science Florence Bretelle-Establet From Documents to Sources in Historiography The present volume develops a specific type of critical analysis of the written documents that have become historians’ sources. For reasons that will be explained later, the history of science in Asia has been taken as a framework. However, the issue addressed is general in scope. It emerged from reflections on a problem that may seem common to historians: why, among the huge mass of written documents available to historians, some have been well studied while others have been dismissed or ignored? The question of historical sources and their (unequal) use in historiography is not new. Which documents have been used and favored as historical sources by historians has been a key historiographical issue that has occupied a large space in the historical production of the last four decades, in France at least.

Handbook on the History of Mathematics Education

Encyclopaedia of the History of Science, Technology, and Medicine in Non-Western Cultures
This volume is dedicated to Miguel Civil in celebration of his 90th birthday. Civil has been one of the most influential scholars in the field of Sumerian studies over the course of his long career. This anniversary presents a welcome occasion to reflect on some aspects of the field in which he has been such a driving force.

**Lengths, Widths, Surfaces**

This work offers a re-edition of twelve mathematical tablets from the site of Tell Harmal, in the borders of present-day Baghdad. In ancient times, Tell Harmal was Šaduppûm, a city representative of the region of the Diyala river and of the kingdom of Ešnunna, to which it belonged for a time. These twelve tablets were originally published in separate articles in the beginning of the 1950s and mostly contain solved problem texts. Some of the problems deal with abstract matters such as triangles and rectangles with no reference to daily life, while others are stated in explicitly empirical contexts, such as the transportation of a load of bricks, the size of a vessel, the number of men needed to build a wall and the acquisition of oil and lard. This new edition of the texts is the first to group them, and takes into account all the recent developments of the research in the history of Mesopotamian mathematics. Its introductory chapters are directed to readers interested in an overview of the mathematical contents of these tablets and the language issues involved in their interpretation, while a chapter of synthesis discusses the ways history of mathematics has typically dealt with the mathematical evidence and inquires how and to what degree mathematical tablets can be made part of a picture of the larger social context. Furthermore, the volume contributes to a geography of the Old Babylonian mathematical practices, by evidencing that scribes at Šaduppûm made use of cultural material that was locally available. The edited texts are accompanied by translations, philological, and mathematical commentaries.

**Scientific Sources and Teaching Contexts Throughout History: Problems and Perspectives**

When we encounter a text, whether ancient or modern, we typically start at the beginning and work our way toward the end. In Tracking the Master Scribe, Sara J. Milstein demonstrates that for biblical and Mesopotamian literature, this habit can lead to misinterpretation. In the ancient Near East, "master scribes"--those who had the authority to produce
and revise literature—regularly modified their texts in the course of transmission. One of the most effective techniques for change was to add something new to the front, what Milstein calls "revision through introduction." This method allowed scribes to preserve their received material while simultaneously recasting it. As a result, many biblical and Mesopotamian texts continue to be interpreted solely through the lens of their final contributions. First impressions carry weight. Tracking the Master Scribe demonstrates what is to be gained when we engage questions of literary history in the context of how scribes actually worked. Drawing upon the two earliest corpora that allow us to track large-scale change, the book provides substantial hard evidence of revision through introduction, as well as a set of detailed case studies that offer fresh insight into well-known biblical and Mesopotamian texts. The result is the first comprehensive profile of this key scribal method: one that was ubiquitous in the ancient Near East and epitomizes the attitudes of the master scribes toward the literature that they left behind.

Perspectives on the History of Ancient Near Eastern Studies

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.

Looking at it from Asia: the Processes that Shaped the Sources of History of Science

In this examination of the Babylonian cuneiform "algebra" texts, based on a detailed investigation of the terminology and discursive organization of the texts, Jens Høyrup proposes that the traditional interpretation must be rejected. The texts turn out to speak not of pure numbers, but of the dimensions and areas of rectangles and other measurable geometrical magnitudes, often serving as representatives of other magnitudes (prices, workdays, etc), much as pure numbers represent concrete magnitudes in modern applied algebra. Moreover, the geometrical procedures are seen to be reasoned to the same extent as the solutions of modern equation algebra, though not built on any explicit deductive structure.

Amazing Traces of a Babylonian Origin in Greek Mathematics

This is the first comprehensive International Handbook on the History of Mathematics Education, covering a wide spectrum of epochs and civilizations, countries and cultures. Until now, much of the research into the rich and varied history of mathematics education has remained inaccessible to the vast majority of scholars, not least because it has been written in the language, and for readers, of an individual country. And yet a historical overview, however brief, has become an indispensable element of nearly every dissertation and scholarly article. This handbook provides, for the first time, a comprehensive and systematic aid for researchers around the world in finding the information they need about historical developments in mathematics education, not only in their own countries, but globally as well. Although written primarily for mathematics educators, this handbook will also be of interest to researchers of the history of education in general, as well as specialists in cultural and even social history.

Tracking the Master Scribe

The History of Mathematics: A Source-Based Approach is a comprehensive history of the development of mathematics.
This, the first volume of the two-volume set, takes readers from the beginning of counting in prehistory to 1600 and the threshold of the discovery of calculus. It is notable for the extensive engagement with original—primary and secondary—source material. The coverage is worldwide, and embraces developments, including education, in Egypt, Mesopotamia, Greece, China, India, the Islamic world and Europe. The emphasis on astronomy and its historical relationship to mathematics is new, and the presentation of every topic is informed by the most recent scholarship in the field. The two-volume set was designed as a textbook for the authors' acclaimed year-long course at the Open University. It is, in addition to being an innovative and insightful textbook, an invaluable resource for students and scholars of the history of mathematics. The authors, each among the most distinguished mathematical historians in the world, have produced over fifty books and earned scholarly and expository prizes from the major mathematical societies of the English-speaking world.

The History of Mathematics: A Source-Based Approach: Volume 1

In the first half of the 2d millennium BCE, translation occasionally depicted semantically incongruous correspondences. Such cases reflect ancient scribes substantiating their virtuosity with cuneiform writing by capitalizing on phonologic, graphemic, semantic, and other resemblances in the interlingual space. These scholar–scribes employed an essential scribal practice, analogical hermeneutics, an interpretative activity grounded in analogical reasoning and empowered by the potentiality of the cuneiform script. Scribal education systematized such practices, allowing scribes to utilize these habits in copying compositions and creating translations. In scribal education, analogical hermeneutics is exemplified in the word list "Izi", both in its structure and in its occasional bilingualism. By examining "Izi" as a product of the social field of scribal education, this book argues that scribes used analogical hermeneutics to cultivate their craft and establish themselves as knowledgeable scribes. Within a linguistic epistemology of cuneiform scribal culture, translation is a tool in the hands of a knowledgeable scholar.

The Accounting Historians Journal
This book presents a novel methodology to study economic texts. The author investigates discrepancies in these writings by focusing on errors, mistakes, and rounding numbers. In particular, he looks at the acquisition, use, and development of practical mathematics in an ancient society: The Old Babylonian kingdom of Larsa (beginning of the second millennium BCE Southern Iraq). In so doing, coverage bridges a gap between the sciences and humanities. Through this work, the reader will gain insight into discrepancies encountered in economic texts in general and rounding numbers in particular. They will learn a new framework to explain error as a form of economic practice. Researchers and students will also become aware of the numerical and metrological basis for calculation in these writings and how the scribes themselves conceptualized value. This work fills a void in Assyriological studies. It provides a methodology to explore, understand, and exploit statistical data. The analysis also fills a void in the history of mathematics by presenting historians of mathematics a method to study practical texts. In addition, the author shows the importance mathematics has as a tool for ancient practitioners to cope with complex economic processes. This serves as a useful case study for modern policy makers into the importance of education in any economy.

New Mathematical Cuneiform Texts

This monumental book traces the origins and development of mathematics in the ancient Middle East, from its earliest beginnings in the fourth millennium BCE to the end of indigenous intellectual culture in the second century BCE when cuneiform writing was gradually abandoned. Eleanor Robson offers a history like no other, examining ancient mathematics within its broader social, political, economic, and religious contexts, and showing that mathematics was not just an abstract discipline for elites but a key component in ordering society and understanding the world. The region of modern-day Iraq is uniquely rich in evidence for ancient mathematics because its prehistoric inhabitants wrote on clay tablets, many hundreds of thousands of which have been archaeologically excavated, deciphered, and translated. Drawing from these and a wealth of other textual and archaeological evidence, Robson gives an extraordinarily detailed picture of how mathematical ideas and practices were conceived, used, and taught during this period. She challenges the prevailing view that they were merely the simplistic precursors of classical Greek mathematics, and explains how the prevailing view came to be. Robson reveals the true sophistication and beauty of ancient Middle Eastern mathematics as it evolved over
three thousand years, from the earliest beginnings of recorded accounting to complex mathematical astronomy. Every chapter provides detailed information on sources, and the book includes an appendix on all mathematical cuneiform tablets published before 2007.

Journal of Cuneiform Studies

Astronomical Cuneiform Texts

Mesopotamian mathematics is known from a great number of cuneiform texts, most of them Old Babylonian, some Late Babylonian or pre-Old-Babylonian, and has been intensively studied during the last couple of decades. In contrast to this Egyptian mathematics is known from only a small number of papyrus texts, and the few books and papers that have been written about Egyptian mathematical papyri have mostly reiterated the same old presentations and interpretations of the texts. In this book, it is shown that the methods developed by the author for the close study of mathematical cuneiform texts can also be successfully applied to all kinds of Egyptian mathematical texts, hieratic, demotic, or Greek-Egyptian. At the same time, comparisons of a large number of individual Egyptian mathematical exercises with Babylonian parallels yield many new insights into the nature of Egyptian mathematics and show that Egyptian and Babylonian mathematics display greater similarities than expected.

The Language of Mathematics

THE MOON IX PREFACE TO THE SPRINGER EDITION When this collection of Babylonian astronomical purpose of column of the lunar ephemerides (by texts was published in 1955 (a date omitted by Aaboe) and the explanation of the method of computing the eclipse text ACT No. 60 (by Hamilton mistake from the title page), it contained all texts of this type that I could lay my hands on. As was to be and Aaboe). Some of these advances I have tried to incorporate into my History of Ancient Mathematical expected, the past 25 years provided more fragments, identified by A. Sachs and A.
Aaboe in the British Astronomy (1975), which should be used as a guide to Museum and listed below. Also, some new joins the more recent literature. could be made and some errors of mine corrected. My sincerest thanks go to Springer-Verlag for Nevertheless, I think one still can consider the making this work again available to students of material of 1955 to be representative of what has been ancient astronomy. The Institute for Advanced preserved of the mathematical astronomy of the Study, which together with Brown University has Seleucid period. supported my work for more than four decades, has In the meantime, far more progress has been made graciously given its permission for this reprint. in our understanding of Babylonian astronomy, mainly by the publications of Aaboe, Hamilton, Maeyama, Sachs, van der Waerden, and others. As an Princeton 0.

Sanskrit Astronomical Tables

This book critically examines four areas common to visual arts curricula: the elements of art and principles of design, the canons of human proportions, linear perspective, and RYB color theory. For each, the author presents a compelling case detailing how current art teaching fails students, explores the history of how it came to be part of the discourse, and then proffers cognitivist and holistic alternatives. This book provides a framework for teachers and teacher-candidates to shape how they advocate for intellectual rigor and embodied learning and, importantly, how they can subvert an existing curriculum to better meet the educational needs of their students.

The 'Resource' Approach to Mathematics Education

This edited volume will help educators better analyze methodological and practical tools designed to aid classroom instruction. It features papers that explore the need to create a system in order to fully meet the uncertainties and developments of modern educational phenomena. These have emerged due to the abundance of digital resources and new forms of collective work. The collected papers offer new perspectives to a rising field of research known as the Documentational Approach to Didactics. This framework was first created by the editors of this book. It seeks to develop a deeper understanding of mathematics teaching expertise. Readers will gain insight into how to meet the theoretical
questions brought about by digitalization. These include: how to analyze teachers’ work when they prepare for their teaching, how to conceptualize the relationships between individual and collective work, and how to follow the related processes over the long term. The contributors also provide a comparative view in terms of contrasting selected phenomena across different educational cultures and education systems. For instance, they consider how differences in curriculum resources are available to teachers and how teachers make use of them to shape instruction. Coverage also considers the extent to which teachers make use of additional material, particularly those available through the global marketplace on the Internet. This book builds on works from the Re(s)sources 2018 Conference, Understanding teachers’ work through their interactions with resources for teaching, held in Lyon, France.

Astronomical Cuneiform Texts

From the reviews: "This monumental work will henceforth be the standard interpretation of ancient mathematical astronomy. It is easy to point out its many virtues: comprehensiveness and common sense are two of the most important. Neugebauer has studied profoundly every relevant text in Akkadian, Egyptian, Greek, and Latin, no matter how fragmentary; [] With the combination of mathematical rigor and a sober sense of the true nature of the evidence, he has penetrated the astronomical and the historical significance of his material. [] His work has been and will remain the most admired model for those working with mathematical and astronomical texts. D. Pingree in Bibliotheca Orientalis, 1977 " a work that is a landmark, not only for the history of science, but for the history of scholarship. HAMA [History of Ancient Mathematical Astronomy] places the history of ancient Astronomy on a entirely new foundation. We shall not soon see its equal. N.M. Swerdlow in Historia Mathematica, 1979

New Mathematical Cuneiform Texts

This volume explores how scholars wrote, preserved, circulated, and read knowledge in ancient Mesopotamia. It offers an exercise in micro-history that provides a case study for attempting to understand the relationship between scholars and scholarship during this time of great innovation. The papers in this collection focus on tablets written in the city of Uruk
in southern Babylonia. These archives come from two different scholarly contexts. One is a private residence inhabited during successive phases by two families of priests who were experts in ritual and medicine. The other is the most important temple in Uruk during the late Achemenid and Hellenistic periods. The contributors undertake detailed studies of this material to explore the scholarly practices of individuals, the connection between different scholarly genres, and the exchange of knowledge between scholars in the city and scholars in other parts of Babylonia and the Greek world. In addition, this collection examines the archives in which the texts were found and the scribes who owned or wrote them. It also considers the interconnections between different genres of knowledge and the range of activities of individual scribes. In doing so, it answers questions of interest not only for the study of Babylonian scholarship but also for the study of ancient Mesopotamian textual culture more generally, and for the study of traditions of written knowledge in the ancient world.

The First Ninety Years

This book focuses on the ancient Near East, early imperial China, South-East Asia, and medieval Europe, shedding light on mathematical knowledge and practices documented by sources relating to the administrative and economic activities of officials, merchants and other actors. It compares these to mathematical texts produced in related school contexts or reflecting the pursuit of mathematics for its own sake to reveal the diversity of mathematical practices in each of these geographical areas of the ancient world. Based on case studies from various periods and political, economic and social contexts, it explores how, in each part of the world discussed, it is possible to identify and describe the different cultures of quantification and computation as well as their points of contact. The thirteen chapters draw on a wide variety of texts from ancient Near East, China, South-East Asia and medieval Europe, which are analyzed by researchers from various fields, including mathematics, history, philology, archaeology and economics. The book will appeal to historians of science, economists and institutional historians of the ancient and medieval world, and also to Assyriologists, Indologists, Sinologists and experts on medieval Europe.

Mathematics in Ancient Iraq
The book analyzes the mathematical tablets from the private collection of Martin Schoyen. It includes analyses of tablets which have never been studied before. This provides new insight into Babylonian understanding of sophisticated mathematical objects. The book is carefully written and organized. The tablets are classified according to mathematical content and purpose, while drawings and pictures are provided for the most interesting tablets.

What Art Teaches Us

A survey of ancient Egyptian mathematics across three thousand years Mathematics in Ancient Egypt traces the development of Egyptian mathematics, from the end of the fourth millennium BC—and the earliest hints of writing and number notation—to the end of the pharaonic period in Greco-Roman times. Drawing from mathematical texts, architectural drawings, administrative documents, and other sources, Annette Imhausen surveys three thousand years of Egyptian history to present an integrated picture of theoretical mathematics in relation to the daily practices of Egyptian life and social structures. Imhausen shows that from the earliest beginnings, pharaonic civilization used numerical techniques to efficiently control and use their material resources and labor. Even during the Old Kingdom, a variety of metrological systems had already been devised. By the Middle Kingdom, procedures had been established to teach mathematical techniques to scribes in order to make them proficient administrators for their king. Imhausen looks at counterparts to the notation of zero, suggests an explanation for the evolution of unit fractions, and analyzes concepts of arithmetic techniques. She draws connections and comparisons to Mesopotamian mathematics, examines which individuals in Egyptian society held mathematical knowledge, and considers which scribes were trained in mathematical ideas and why. Of interest to historians of mathematics, mathematicians, Egyptologists, and all those curious about Egyptian culture, Mathematics in Ancient Egypt sheds new light on a civilization's unique mathematical evolution.

A Remarkable Collection of Babylonian Mathematical Texts

Here, at last, is the massively updated and augmented second edition of this landmark encyclopedia. It contains approximately 1000 entries dealing in depth with the history of the scientific, technological and medical accomplishments
of cultures outside of the United States and Europe. The entries consist of fully updated articles together with hundreds of entirely new topics. This unique reference work includes intercultural articles on broad topics such as mathematics and astronomy as well as thoughtful philosophical articles on concepts and ideas related to the study of non-Western Science, such as rationality, objectivity, and method. You’ll also find material on religion and science, East and West, and magic and science.

Babylonian Mathematical Astronomy: Procedure Texts

THE MOON IX PREFACE TO THE SPRINGER EDITION When this collection of Babylonian astronomical purpose of column of the lunar ephemerides (by texts was published in 1955 (a date omitted by Aaboe) and the explanation of the method of computing the eclipse text ACT No. 60 (by Hamilton mistake from the title page), it contained all texts of this type that I could lay my hands on. As was to be and Aaboe). Some of these advances I have tried to incorporate into my History of Ancient Mathematical expected, the past 25 years provided more fragments, identified by A. Sachs and A. Aaboe in the British Astronomy (1975), which should be used as a guide to Museum and listed below. Also, some new joins the more recent literature. could be made and some errors of mine corrected. My sincerest thanks go to Springer-Verlag for Nevertheless, I think one still can consider the making this work again available to students of material of 1955 to be representative of what has been ancient astronomy. The Institute for Advanced preserved of the mathematical astronomy of the Study, which together with Brown University has Seleucid period. supported my work for more than four decades, has In the meantime, far more progress has been made graciously given its permission for this reprint. in our understanding of Babylonian astronomy, mainly by the publications of Aaboe, Hamilton, Maeyama, Sachs, van der Waerden, and others. As an Princeton 0.

Pi: A Source Book

Proceedings, American Philosophical Society (vol. 107, no. 6, 1963)
This groundbreaking volume provides an up-to-date, accessible guide to Sanskrit astronomical tables and their analysis. It begins with an overview of Indian mathematical astronomy and its literature, including table texts, in the context of history of pre-modern astronomy. It then discusses the primary mathematical astronomy content of table texts and the attempted taxonomy of this genre before diving into the broad outlines of their representation in the Sanskrit scientific manuscript corpus. Finally, the authors survey the major categories of individual tables compiled in these texts, complete with brief analyses of some of the methods for constructing and using them, and then chronicle the evolution of the table-text genre and the impacts of its changing role on the discipline of Sanskrit jyotia. There are also three appendices: one inventories all the identified individual works in the genre currently known to the authors; one provides reference information about the details of all the notational, calendric, astronomical, and other classification systems invoked in the study; and one serves as a glossary of the relevant Sanskrit terms.

Unexpected Links Between Egyptian and Babylonian Mathematics

This book examines the textual, social, cultural, practical and institutional environments to which the expression “teaching and learning contexts” refers. It reflects on the extent to which studying such environments helps us to better understand ancient or modern sources, and how notions of “teaching” and “learning” are to be understood. Tackling two problems: the first, is that of certain sources of scientific knowledge being studied without taking into account the various “contexts” of transmission that gave this knowledge a long-lasting meaning. The second is that other sources are related to teaching and learning activities, but without being too precise and demonstrative about the existence and nature of this “teaching context”. In other words, this book makes clear what is meant by “context” and highlights the complexity of the practice hidden by the words “teaching” and “learning”. Divided into three parts, the book makes accessible teaching and learning situations, presents comparatist approaches, and emphasizes the notion of teaching as projects embedded in coherent treatises or productions.

Mathematical Tablets from Tell Harmal
This exploration of the Judean priesthood’s role in agricultural cultivation demonstrates that the institutional reach of Second Temple Judaism (516 BCE–70 CE) went far beyond the confines of its houses of worship, while exposing an unfamiliar aspect of sacred place-making in the ancient Jewish experience. Temples of the ancient world regularly held assets in land, often naming a patron deity as landowner and affording the land sanctity protections. Such arrangements can provide essential background to the Hebrew Bible’s assertion that God is the owner of the land of Israel. They can also shed light on references in early Jewish literature to the sacred landholdings of the priesthood or the temple.

Land and Temple

This book contains new translations and a new analysis of the procedure texts of Babylonian mathematical astronomy, the earliest known form of mathematical astronomy of the ancient world. The translations are based on a modern approach incorporating recent insights from Assyriology and translation science. The work contains updated and expanded interpretations of the astronomical algorithms and investigations of previously ignored linguistic, mathematical and other aspects of the procedure texts. Special attention is paid to issues of mathematical representation and over 100 photos of cuneiform tablets dating from 350-50 BCE are presented. In 2-3 years, the author intends to continue his study of Babylonian mathematical astronomy with a new publication which will contain new editions and reconstructions of approx. 250 tabular texts and a new philological, astronomical and mathematical analysis of these texts. Tabular texts are end products of Babylonian math astronomy, computed with algorithms that are formulated in the present volume, Procedure Texts.

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