

# SCIENTIFIC METHOD IN PTOLEMY'S 'HARMONICS'



ANDREW BARKER

# Scientific Method In Ptolemys Harmonics

**Leonid Zhmud**



## **Scientific Method In Ptolemys Harmonics:**

**Scientific Method in Ptolemy's Harmonics** Andrew Barker, 2000 The science called harmonics was one of the major intellectual enterprises of Greek antiquity Ptolemy's treatise seeks to invest it with new scientific rigour its consistently sophisticated procedural self awareness marks it as a key text in the history of science This book is a sustained methodological exploration of Ptolemy's project After an analysis of his explicit pronouncements on the science's aims and the methods appropriate to it it examines Ptolemy's conduct of his investigation in detail concluding that despite occasional uncertainties the declared procedure is followed with remarkable fidelity Ptolemy pursues tenaciously his novel objective of integrating closely the project's theoretical and empirical phases and shows astonishing mastery of the concept the design and the conduct of controlled experimental tests By opening up this neglected text to historians of science the book aims to provide a point of departure for wider studies of Greek scientific method *Porphry's Commentary on Ptolemy's*

*Harmonics*, 2015-09-15 Porphyry's Commentary the only surviving ancient commentary on a technical text is not merely a study of Ptolemy's Harmonics It includes virtually free standing philosophical essays on epistemology metaphysics scientific methodology aspects of the Aristotelian categories and the relations between Aristotle's views and Plato's and a host of briefer comments on other matters of wide philosophical interest For musicologists it is widely recognised as a treasury of quotations from earlier treatises many of them otherwise unknown but Porphyry's own reflections on musical concepts for instance notes intervals and their relation to ratios quantitative and qualitative conceptions of pitch the continuous and discontinuous forms of vocal movement and so on and his snapshots of contemporary music making have been undeservedly neglected This volume presents the first English translation and a revised Greek text of the Commentary with an introduction and notes designed to assist readers in engaging with this important and intricate work **Ptolemy's Philosophy**

Jacqueline Feke, 2020-10-13 A stimulating intellectual history of Ptolemy's philosophy and his conception of a world in which mathematics reigns supreme The Greco Roman mathematician Claudius Ptolemy is one of the most significant figures in the history of science He is remembered today for his astronomy but his philosophy is almost entirely lost to history This groundbreaking book is the first to reconstruct Ptolemy's general philosophical system including his metaphysics epistemology and ethics and to explore its relationship to astronomy harmonics element theory astrology cosmology psychology and theology In this stimulating intellectual history Jacqueline Feke uncovers references to a complex and sophisticated philosophical agenda scattered among Ptolemy's technical studies in the physical and mathematical sciences She shows how he developed a philosophy that was radical and even subversive appropriating ideas and turning them against the very philosophers from whom he drew influence Feke reveals how Ptolemy's unique system is at once a critique of prevailing philosophical trends and a conception of the world in which mathematics reigns supreme A compelling work of scholarship Ptolemy's Philosophy demonstrates how Ptolemy situated mathematics at the very foundation of all philosophy

theoretical and practical and advanced the mathematical way of life as the true path to human perfection     The Monochord in Ancient Greek Harmonic Science David Creese, 2010-06-10 Traces the history of the monochord from its earliest appearance to Claudius Ptolemy mid second century AD     *Pythagoras and the Early Pythagoreans* Leonid Zhmud, 2012-05-31 In ancient tradition Pythagoras emerges as a wise teacher an outstanding mathematician an influential politician and as a religious and ethical reformer This volume offers a comprehensive study of Pythagoras Pythagoreanism and the early Pythagoreans through an analysis of the many representations of the individual and his followers     Studies in the History of the Exact Sciences in Honour of David Pingree Jan P. Hogendijk, Kim Plofker, Michio Yano, Charles Burnett, 2004-02-01 This collection of essays reflects the wide range of David Pingree s expertise in the scientific texts above all concerning astronomy and astrology of Ancient Mesopotamia Greece India Persia and the medieval Arabic Hebrew and Latin traditions Both theoretical aspects and the practical applications of the exact sciences in time keeping prediction of the future and the operation of magic are dealt with The book includes several critical editions and translations of hitherto unknown or understudied texts and a particular emphasis is on the diffusion of scientific learning from one culture to another and through time Above all the essays show the variety and sophistication of the exact sciences in non Western societies in pre modern times     **Early Music History: Volume 27** Iain Fenlon, 2009-05-21 The study of music from the early Middle Ages to end of the seventeenth century     **Wrestling with Nature** Peter Harrison, Ronald L. Numbers, Michael H. Shank, 2011-05-01 When and where did science begin Historians have offered different answers to these questions some pointing to Babylonian observational astronomy some to the speculations of natural philosophers of ancient Greece Others have opted for early modern Europe which saw the triumph of Copernicanism and the birth of experimental science while yet another view is that the appearance of science was postponed until the nineteenth century Rather than posit a modern definition of science and search for evidence of it in the past the contributors to *Wrestling with Nature* examine how students of nature themselves in various cultures and periods of history have understood and represented their work The aim of each chapter is to explain the content goals methods practices and institutions associated with the investigation of nature and to articulate the strengths limitations and boundaries of these efforts from the perspective of the researchers themselves With contributions from experts representing different historical periods and different disciplinary specializations this volume offers a fresh perspective on the history of science and on what it meant in other times and places to wrestle with nature

**Greek Reflections on the Nature of Music** Flora R. Levin, 2009-04-27 In this book Flora Levin explores how and why music was so important to the ancient Greeks She examines the distinctions that they drew between the theory of music as an art ruled by number and the theory wherein number is held to be ruled by the art of music These perspectives generated more expansive theories particularly the idea that the cosmos is a mirror image of music s structural elements and conversely that music by virtue of its cosmic elements time motion and the continuum is itself a mirror image of the cosmos

These opposing perspectives gave rise to two opposing schools of thought the Pythagorean and the Aristoxenian Levin argues that the clash between these two schools could never be reconciled because the inherent conflict arises from two different worlds of mathematics Her book shows how the Greeks appreciation of the profundity of music s interconnections with philosophy mathematics and logic led to groundbreaking intellectual achievements that no civilization has ever matched

The Origin of the History of Science in Classical Antiquity Leonid Zhmud,2008-08-22 This is the first comprehensive study of what remains of the writings of Aristotle s student Eudemus of Rhodes on the history of the exact sciences These fragments are crucial to our understanding of the content form and goal of the Peripatetic historiography of science The first part of the book presents an analysis of those trends in Presocratic Sophistic and Platonic thought that contributed to the development of the history of science The second part provides a detailed study of Eudemus writings in their relationship with the scientific literature of his time Aristotelian philosophy and the other historiographic genres practiced at the Lyceum biography medical and natural philosophical doxography Although Peripatetic historiography of science failed in establishing itself as a continuous genre it greatly contributed both to the birth of the Arabic medieval historiography of science and to the development of this genre in Europe in the 16th 18th centuries     **Rationality and Reality** Colin Cheyne,John

Worrall,2006-07-25 Alan Musgrave has consistently defended two positions that he regards as commonsensical critical realism and critical rationalism In defence of critical realism he argues for the objective existence of the external world as opposed to idealism as well as arguing for scientific realism against all anti realist accounts of science His critical rationalism is drawn from the work of Karl Popper and stands opposed to inductivist and irrationalist methodologies In defence of these positions Musgrave s writings have covered a wide range of topics in epistemology metaphysics philosophy of science philosophy of mathematics history of science theories of truth and economic theory In this volume a group of internationally renowned authors discuss themes that are relevant in one way or another to Musgrave s work This is not intended as a standard celebratory festschrift but rather as a new examination of topics of current interest in philosophy The contributory essays are followed by responses from Alan Musgrave himself     "Music, Experiment and Mathematics in England,

1653?705 " Benjamin Wardhaugh,2017-07-05 How in 1705 was Thomas Salmon a parson from Bedfordshire able to persuade the Royal Society that a musical performance could constitute a scientific experiment Or that the judgement of a musical audience could provide evidence for a mathematically precise theory of musical tuning This book presents answers to these questions It constitutes a general history of quantitative music theory in the late seventeenth century as well as a detailed study of one part of that history namely the applications of mathematical and mechanical methods of understanding to music that were produced in England between 1653 and 1705 beginning with the responses to Descartes s 1650 Compendium music and ending with the Philosophical Transactions account of the appearance of Thomas Salmon at the Royal Society in 1705 The book is organized around four key questions Do musical pitches form a small set or a continuous spectrum Is there

a single faculty of hearing which can account for musical sensation or is more than one faculty at work What is the role of harmony in the mechanical world and where can its effects be found And what is the relationship between musical theory and musical practice These are questions which are raised and discussed in the sources themselves and they have wide significance for early modern theories of knowledge and sensation more generally as well as providing a fascinating side light onto the world of the scientific revolution

*The Limits of Exactitude in Greek, Roman, and Byzantine Literature and Textual Transmission* Nicoletta Bruno, Giulia Dovico, Olivia Montepaone, Marco Pelucchi, 2022-11-07 Building on Calvino's observations on Exactitude in *Six Memos for the Next Millennium* the present book elucidates on the possible definitions of exactitude the endeavor of reaching exactitude and the undeniable limits to the achievement of this ambitious milestone The eighteen essays in this interdisciplinary volume show how ancient and medieval authors have been dealing with the problem of exactitude vs inexactitude and have been able to exploit the ambiguities related to these two concepts to various ends The articles focus on rhetoric and historiography section I exact sciences and technical disciplines II the peculiarity of quotations III cases of programmatic inexactitude IV and textual transmission V Several interconnected questions weave a net across the volume to what extent is exactitude the goal in ancient and medieval texts How can the concepts of accuracy and inaccuracy aid the reinterpretation of an already known text or fact To what extent can certain definitions of exactitude be stretched without turning into inexactitude The volume presents an extensive study capable of highlighting the shrewdness and aptness of the concepts introduced by Calvino more than thirty years ago

*Cultures of Mathematics and Logic* Shier Ju, Benedikt Löwe, Thomas Müller, Yun Xie, 2016-08-10 This book gathers the proceedings of the conference Cultures of Mathematics and Logic held in Guangzhou China The event was the third in a series of interdisciplinary international conferences emphasizing the cultural components of philosophy of mathematics and logic It brought together researchers from many disciplines whose work sheds new light on the diversity of mathematical and logical cultures and practices In this context the cultural diversity can be diachronical different cultures in different historical periods geographical different cultures in different regions or sociological in nature

*Case Studies* Giulio Colesanti, Laura Lulli, 2016-03-07 The book is the second volume of a series of studies dealing with the Submerged literature in ancient Greek culture s vol 1 G Colesanti M Giordano eds *Submerged Literature in Ancient Greek Culture An Introduction* Berlin Boston de Gruyter 2014 It is a peculiar starting point of the research in the field of Greek culture since it casts a light on many case studies so far not yet analyzed as literary products subjected to the process of submersion e g oracles philosophy phylax play epigrams Aesopic fables periplus sacred texts mysteries medical treatises dance music Therefore the book investigates the complex and manifold dynamics of emergence and submersion in ancient Greek literary culture dealing especially with matters as the interaction between orality and literacy the authorship the cultural transmission the folklore Moreover the book offers the reader new stimulating approaches in order to reconstruct the wide frame which contained the overall cultural processes including the

literary products subjected to the submersion in a chronological span going from Greek archaic age to the Imperial age

The Rationalists: Between Tradition and Innovation Carlos Fraenkel, Dario Perinetti, Justin E. H. Smith, 2010-10-12 This volume draws a balanced picture of the Rationalists by bringing their intellectual contexts sources and full range of interests into sharper focus without neglecting their core commitment to the epistemological doctrine that earned them their traditional label The collection of original essays addresses topics ranging from theodicy and early modern music theory to Spinoza's anti humanism often critically revising important aspects of the received picture of the Rationalists Another important contribution of the volume is that it brings out aspects of Rationalist philosophers and their legacies that are not ordinarily associated with them such as the project of a Cartesian ethics Finally a strong emphasis is placed on the connection of the Rationalists philosophy to their interests in empirical science to their engagement in the political life of their era and to the religious background of many of their philosophical commitments *Heinrich Schenker's Conception of Harmony* Robert Wesley Wason, Matthew Brown, 2020 The first detailed study of Schenker's pathbreaking 1906 treatise showing how it reflected 2500 years of thinking about harmony and presented a vigorous reaction to Austro Germanic music theory ca 1900 What makes the compositions of Handel Bach Haydn Mozart Beethoven Schubert Schumann Chopin and Brahms stand out as great works of art Heinrich Schenker 1868-1935 set out to answer this question in a series of treatises beginning with a strikingly original work with the deceptive title *Harmonielehre* roughly Treatise on Harmony 1906 Whereas other treatises of the period associated harmony with the abstract principles governing chords and chord progressions Schenker's treated it as the conceptual glue that allowed the individual elements of a work melodies motives chords counterpoint etc to work together locally and globally Yet this book though renowned and much cited has never been studied systematically and in close detail Heinrich Schenker's *Conception of Harmony* approaches Schenker's 1906 treatise as a synthesis of ancient ideas and very new ones It translates for the first time two preparatory essays for *Harmonielehre* and describes his later views of harmony and the ways in which they influenced and also were ignored by the 1954 edition and translation entitled simply *Harmony* Though problematic *Harmony* was the first published translation of a major work by Schenker inaugurating the study of his writings in postwar America and Britain where they continue to be highly influential

Ancient Greek and Roman Science Liba Taub, 2023 Liba Taub gives an overview of the major developments in early science between the 8th century BC and 6th century AD Focussing on Greece and Rome she discusses the key thinkers and their theories and traces the evolution of ideas concerning the natural world and its operation and considers the influence these ideas have had on later centuries **A History of Pythagoreanism** Carl A. Huffman, 2014-04-24 This is a comprehensive authoritative and innovative account of Pythagoras and Pythagoreanism one of the most enigmatic and influential philosophies in the West In twenty one chapters covering a timespan from the sixth century BC to the seventeenth century AD leading scholars construct a number of different images of Pythagoras and his community assessing current

scholarship and offering new answers to central problems Chapters are devoted to the early Pythagoreans and the full breadth of Pythagorean thought is explored including politics religion music theory science mathematics and magic Separate chapters consider Pythagoreanism in Plato Aristotle the Peripatetics and the later Academic tradition while others describe Pythagoreanism in the historical tradition in Rome and in the pseudo Pythagorean writings The three great lives of Pythagoras by Diogenes Laertius Porphyry and Iamblichus are also discussed in detail as is the significance of Pythagoras for the Middle Ages and Renaissance     Aristoxenus of Tarentum and the Birth of Musicology Sophie Gibson, 2014-04-08

Aristoxenus made an enormous contribution to the development of music theory in antiquity Despite his Pythagorean upbringing he rejected Pythagorean methods of harmonics which focused on the mathematical significance of musical structures and instead applied a scientific methodology appropriated from Aristotle This volume studies the theories of Aristoxenus



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