

Introduction

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In recent years, ancient Pythagoreanism has tended to be a field pursued by a narrow group of specialists and ignored by most scholars of ancient philosophy and ancient civilization. The field can look like a morass that is better not entered at all or bridged by time-worn platitudes about Pythagoras. Many discussions of Pythagoras and Pythagoreanism in general works about ancient civilization or Western culture are thus woefully uninformed. For there has been a great deal of important scholarship on Pythagoreanism in the last fifty years, so that the Pythagoras of current scholarship is not your mother's let alone your grandmother's Pythagoras. The crucial moment in modern scholarship on Pythagoreanism was the publication fifty years ago of Walter Burkert's epoch-making study, which appeared ten years later in a revised version translated into English by Edwin Minar with the title *Lore and Science in Ancient Pythagoreanism* (1972). References to Burkert's book in the footnotes of this volume are surely more frequent than those to any other piece of scholarship on Pythagoreanism. Burkert's Pythagoras was a religious leader and founder of a way of life and not the great mathematician to which many general accounts tenaciously cling. Yet even Burkert's view has not won universal acceptance; Pythagoras the mathematician survives among some scholars even in this book, and there has been significant scholarship that both builds on and reacts against Burkert.

The purpose of this book, then, is two-fold. The first goal is to provide a reliable, comprehensive and accessible snapshot of the current state of scholarship on Pythagoras and Pythagoreanism. It is an invitation to the academic community and the educated public to enter the morass and discover that the issues, while complex, are not hopelessly obscure; a considerable amount of clarity, if not consensus, has been achieved. The second goal is to generate interest in Pythagoras and Pythagoreanism by highlighting problems and suggesting new answers to them. The hope is that those who have been tempted to engage some of the complexity of

the field would become intrigued enough to contribute to it. So this is not a history whose goal is to suggest that scholarship has arrived at a consensus on a series of issues and to present a static picture; rather it is a history that treats the field as an evolving discussion and presents the current state of that discussion including all its controversies and debates. It attempts to provide the reader with some solid ground in approaching Pythagoreanism, while at the same time showing that there is much that is contested and that many problems need further analysis.

It is crucial to recognize that there are many Pythagorases and many Pythagoreanisms in this book. No one Pythagoras or Pythagoreanism emerges because there is not one Pythagoras in the ancient sources and different modern interpreters derive a different picture even from the same sources. This book can then be seen as a celebration of this diversity of interpretations of Pythagoras and Pythagoreanism and its chapters make engaging reading just because of the sheer variety of uses to which Pythagoreanism has been put. Pythagoras himself is at the same time one of the most intriguing figures in the history of Greek philosophy and also the most enigmatic and frustrating. There can be no doubt that a great legend arose about him and that images of him and his philosophy proliferated. Is there something behind that legend, as most have supposed, or is early Pythagoreanism almost totally the creation of the later tradition with little historical reality to support it? In the first chapter of this volume Geoffrey Lloyd confronts the possibility that the historical Pythagoras is almost totally unrecoverable. He provides important arguments for this analysis. The painting on the cover of this book by Salvator Rosa, *Pythagoras Emerging from the Underworld* (1662), now in the Kimbell Art Museum in Fort Worth, thus nicely encapsulates one of its main lessons. Pythagoras himself is an obscure figure, difficult to make out in the lower right-hand corner of the painting, although a ray of light plays across his crouched figure. What is at the center of the painting and takes up the bulk of the space is the reaction to Pythagoras by the other figures. Thus, the historical Pythagoras may not be as important as the reactions to him.

However, even with the difficulties identified by Lloyd, it is folly to deny our desire as scholars to arrive at a picture of the historical Pythagoras, for we, like the figures in the painting, are drawn to look back to him. If Pythagoreanism has wielded the very considerable influence that this volume documents, it is natural to wonder about the origin of the influence. So, although Lloyd's skepticism is closer to the modern consensus about Pythagoras, even in this volume there are alternatives to it; e.g., Zhmud's account of fifth-century Pythagoreans assumes a picture of Pythagoras who

was an important mathematician and scientist after all. Moreover, even if it is difficult to say anything reliable about Pythagoras himself, recent scholarship suggests that we can say something about early Pythagoreanism and particularly about Philolaus and Archytas. One of the important developments in scholarship of the last fifty years has been the emergence of a consensus that a core of the fragments of Philolaus are authentic so that we have some actual early Pythagorean texts, and Chapter 3 below emphasizes Philolaus' importance for Presocratic philosophy. Archytas emerges as a central figure in several of the following chapters (e.g., Chapters 8 and 10), although in the chapter devoted to Archytas himself, Schofield evinces a skepticism about him that is similar to that of Lloyd about Pythagoras. Recent scholarship has also suggested that Aristoxenus' *Pythagorean Precepts* provide accurate information about the Pythagorean way of life in the fourth century, and these *Precepts* figure prominently in several chapters (e.g., Chapters 10 and 13). If it is foolish to suppose that Pythagoras as the origin of Pythagoreanism, or the nature of early Pythagoreanism, will ever lose their allure, it is equal folly to dismiss later images of Pythagoras and Pythagoreanism as unimportant on the grounds that they tell us little about the historical Pythagoras, as sometimes has been done by scholars who reduce later accounts of Pythagoreanism to mines for earlier sources. The Pythagoreanisms of the pseudo-Pythagorean writings, of Cicero, of Iamblichus, of the Middle Ages and the Renaissance are fascinating in their own right.

In attempts to recover the figure of the historical Pythagoras and the nature of early Pythagoreanism, source criticism is, nonetheless, incredibly important. One's view of Pythagoras and the early Pythagoreans is almost totally determined by what one considers reliable testimony, as well as by interpretations of individual words in those testimonia. Because of the weakness of our sources there has been a great deal of reconstruction, some of it brilliant but still based on slender evidence, which, if doubted, leads to a radically different picture. Does Eudemus mention Pythagoras in his overview of the history of Greek geometry, which most scholars think Proclus preserves in the preface to his commentary on Book 1 of Euclid? If he does, then this is a strong reason for thinking that Pythagoras was indeed a mathematician. If he does not, it is an equally strong ground for supposing that he was not (see Chapter 13 below).

In the chapters below the authors will show striking divergences in approach and strong disagreements on specific points. To some extent this reflects my choices in enlisting contributors. My goal was to include not only leading scholars in the study of Pythagoreanism but also leading

scholars in the field of ancient philosophy as a whole, who had not done much work on Pythagoreanism and could thus bring fresh ideas to old problems. In addition the contributors are a mix of senior scholars and scholars who are relatively early in their careers. Finally, although this book is in English and is in the first place directed to the English-speaking world, a significant number of the authors are from European universities; these contributors ensure that a wide range of European scholarship is represented in the content of the chapters and in the bibliography. In the rest of this introduction I will highlight some of the points of convergence and divergence from this diverse group of contributors and give a taste of the varieties of Pythagoreanism they depict. My reading is, of course, just one reading of the chapters that follow. It cannot encompass everything important that is discussed in them and represents just one viewpoint on what they do discuss. Each of the chapters has been broken into separate sections so that a relatively clear idea of their contents can be gleaned by skimming those section headings.

In the opening chapter, **Geoffrey Lloyd** concludes that recent scholarship has not produced a clearer picture of Pythagoras but rather clarified the difficulties involved in reaching such a picture. The sharp divergence between two such accomplished scholars as Burkert and Guthrie, in the accounts they gave of Pythagoras some fifty years ago, already heralded the intractable nature of the problem. Lloyd stresses that Pythagoras eludes most modern labels. There is no reliable evidence that he was a mathematician (*pace* Guthrie) but there are also problems with identifying him as a shaman (*pace* Burkert) or charismatic (*pace* Riedweg). Comparisons with other cultural traditions, such as that of China, and advances in the study of the history of science and the ethnography of shamanism can shed some light, but they do not allow us to flesh out the vague image of Pythagoras. He was certainly an historical figure (*c.* 570–490 BC), who had a significant impact on his contemporaries. He spent his early life on the Greek island of Samos but later moved on to the Greek cities of Croton and Metapontum in southern Italy. Lloyd carefully considers the early evidence for Pythagoras' views but finds little firm ground. He was famed for his wisdom, way of life and views about the soul, but, in the end, it remains very unclear in what his wisdom resided and what, in detail, were the nature of his way of life and his views on the soul. The answers that individual scholars give to these questions just seem to reflect the prejudices that they bring to the investigation. It is only with Philolaus (*c.* 470–390 BC) and Archytas (*c.* 430–350 BC), more than fifty years after Pythagoras' death, that we get firm evidence for Pythagorean harmonics, mathematics and

cosmology. The next two chapters on Philolaus and Archytas respectively, thus become very important.

Daniel W. Graham embraces the view that Philolaus has emerged from the shadow of Pythagoras to become in many ways the originator of Pythagorean philosophy and one of the most important fifth-century philosophers. Philolaus argues that there are two types of basic realities, limiters and unlimiteds, but a third principle, harmony, is needed to hold them together in a unity. Philolaus drew his unlimiteds from the traditional Presocratic emphasis on elements that were indeterminate stuffs such as air (Anaximenes) and “the unlimited” (Anaximander) as well as indefinite continua of qualities such as the hot and the cold. Philolaus’ striking innovation was to insist that limiters (e.g. shapes and structures) were equally important elements. The harmonious combination of limiters and unlimiteds produces concrete physical objects. Philolaus crucially recognized that without limits, i.e., without “structures, patterns and hierarchies,” there can be no knowledge, no science. Philolaus’ conception of science thus stresses “systematization or classification” of a subject matter. His postulation of limiters and unlimiteds as basic principles as well as this conception of science exercised clear influence on Plato in the *Philebus*, where limit and unlimited appear as principles. With regard to his cosmology, there remains controversy as to what extent Philolaus is attempting to give a rational as opposed to mythical account of the world or if he is giving an account that combines the two. Philolaus is famous as the first thinker to make the earth a planet rather than the immobile center of the universe, but it orbits the central fire rather than the sun. It is Philolaus’ postulation of another body, the counter-earth (to bring the bodies arranged around the central fire up to the perfect number ten, according to Aristotle), that has been particularly controversial. Graham provides a revolutionary new analysis of its role in his astronomical scheme. He argues that it, in fact, served to explain certain lunar eclipses. This analysis supports Philolaus’ status as one of the most original cosmologists of the fifth century but one who also belongs firmly in the tradition of rational rather than mythic cosmology. In addition Graham underlines Philolaus’ development of a new paradigm of scientific investigation and his role in the development of the Greek concepts of cause and starting-point (ἀρχή).

Malcolm Schofield recognizes Archytas as a significant figure in the history of Greek science and the first and only Pythagorean who can confidently be described as a major mathematician. He was also an important political leader. This prominent role for Archytas will be echoed in Netz’s chapter on Pythagorean mathematics and Barker’s on Pythagorean

harmonics. But Schofield asks, was he a philosopher? The quick answer is yes, since he put forth the most famous argument in antiquity for an infinite universe. At this point, however, Schofield adopts a skeptical stance regarding what we can know about Archytas that is similar to that which Lloyd adopts concerning Pythagoras, and for the same reasons, the scarcity and unreliability of our sources. There is information for Archytas' views in a wide range of fields but most of it is fraught with difficulties. For example, Schofield doubts that the evidence allows us to conclude that Archytas made significant contributions to the fields of mechanics or optics as some scholars have supposed. Again he suggests that Aristotle's remarks about Archytas' definitions may not indicate that he had "an explicit theory of definition," as Huffman has suggested, but may rather reflect commentary on poetry and correct usage of words in the fashion of the sophist Prodicus. In addition to encouraging us to be skeptical about some of the evidence for Archytas the philosopher, however, Schofield also makes important advances in the analysis of the fragments of Archytas commonly accepted as authentic (e.g., frs. 1–3). He also provides new arguments against the authenticity of the fragments of *On Law and Justice*, which are the only other fragments whose authenticity a significant number of scholars have defended. In the course of casting further doubt on these fragments, however, he provides further support of the authenticity of fr. 3. He presents a nuanced discussion of the relation between Plato and Archytas, but is skeptical of any significant impact of Archytas on Aristotle; he expresses serious doubts about the authenticity of the works on Archytas that appear in the ancient lists of Aristotle's works.

Leonid Zhmud's chapter on Pythagoreans of the sixth through fourth centuries BC, apart from "the big three" (Pythagoras, Philolaus and Archytas), provides an excellent example of the contested state of the evidence concerning Pythagoreanism. His account of these Pythagoreans is inevitably based on his own view of Pythagoras himself and the nature of early Pythagoreanism as a whole. Zhmud presents a view of Pythagoras as a mathematician who founded the sciences of arithmetic and harmonics, although the dominant view since Burkert's work, a view reflected in Lloyd's chapter on Pythagoras and Netz's chapter on Pythagorean mathematics, is that Pythagoras was not a mathematician. Similarly Zhmud accepts Becker's reconstruction of an early Pythagorean arithmetic, while Netz rejects it. Even more strikingly, Zhmud argues that after Pythagoras we do not find a single religious figure among the Pythagoreans of the sixth through fourth century, whereas Gemelli Marciano argues in her account of the Pythagorean life that religion is central to Pythagoreanism.

Similarly Zhmud maintains that there was no split into *acusmatici*, who followed the oral precepts of Pythagoras known as *acusmata*, and *mathematici*, who focused on more scientific disciplines. He argues that this split is the creation of the later tradition, although Burkert and many others think that it occurred in the fifth century and is already found in the testimony of Aristotle. Thus, Gemelli Marciano finds the *acusmata* central to the Pythagorean way of life. Finally, there is no more hotly debated question than who counts as a Pythagorean. Zhmud treats Alcmaeon as a Pythagorean and makes him crucial to his picture of early Pythagorean natural science, as Theodorus is important to Pythagorean mathematics, while other scholars do not regard Alcmaeon or Theodorus as Pythagoreans at all. Zhmud stresses the great heterogeneity of the Pythagoreans and, borrowing a concept from Wittgenstein, argues that while there was a family resemblance among Pythagoreans, there was no single common characteristic shared by all Pythagoreans (except that apart from Pythagoras none were religious figures). He gives accounts of a number of possible but little known early Pythagoreans such as Hippasus, Hippo, Menestor and Ecphantus.

Focus then turns from individual Pythagoreans to the major areas in which early Pythagoreanism manifested itself: politics, way of life, religion, mathematics and harmonics. **Catherine Rowett** provides a fresh look at the role of Pythagoras and the Pythagorean society in the politics of the Greek city-states of southern Italy. She stresses that Pythagoras' political activity began after leaving Samos for southern Italy (c. 530 BC) but suggests that a connection with Apollo and the Delphic oracle had already been established and may have had a role in his choice of Croton as a place to settle and in guiding his actions there. She argues that the groups to which Pythagoras made his addresses upon his first arrival in Croton (the old men, youth, boys and women of the city) were not traditional groupings but represent a radical new approach to teaching. Nonetheless, he speaks to these groups at sites associated with traditional *polis* religion rather than invoking mystery cults. Thus, while he may have taught metempsychosis and rewards and punishments after death to his close followers, his message to the city itself was much more traditional. The emphasis on the role of women in the Pythagorean tradition is striking. Although some sources suggest that he revived traditional values, Rowett argues that he was much more revolutionary. Women were regarded as not just faithful wives but also part of the intellectual life of the community. Pythagoras' division of women into age groupings may have furthered radical goals such as assigning women roles by age and experience rather than status or

wealth. She concludes by examining the reports about the attacks on the Pythagoreans in southern Italy and sees in them support for her general view about the Pythagorean political agenda and methods. It is a mistake to understand the attacks in the traditional terms of a conflict between democrats and oligarchs. Pythagoreans did not try to change the constitution but rather offered different policies, which were promoted through the Pythagorean clubs (*hetaireiai*). Thus, the attacks on the Pythagoreans are to be understood as the work of rival clubs of propertied citizens challenging Pythagorean policies and in particular the fundamental Pythagorean idea that “friends have all things in common.” They resorted to assassination because the “widespread respect for the Pythagoreans” offered little hope for replacing Pythagorean policies by normal political means.

Surely the way of life that Pythagoras prescribed for his followers must have had a role in the political impact described by Rowett. Moreover, those who follow Burkert’s view of Pythagoras recognize that the way of life that Pythagoras left to his followers is crucial in defining Pythagoreanism, yet as Lloyd notes it has been hard to reconstruct confidently what that life was like. **M. Laura Gemelli Marciano** suggests that we can only really understand the way of life in light of a distinction between instrumental and receptive consciousness employed by the psychiatrist A. Deikmann. Pythagoras and the Pythagorean life embody the outlook of receptive consciousness, which tries to act in harmony with and in service to a reality that is seen as a connected whole; moderns, however, often misunderstand them by adopting the view of instrumental consciousness, whose focus is on separation from external reality and domination of it. She argues that the socio-political impact of the movement, which Rowett describes in her chapter, is unintelligible without appreciating it as a manifestation of instrumental consciousness, which acts to help communities on behalf of the divine. She emphasizes that the Pythagorean way of life and Pythagorean ethics cannot be separated from their religious dimension. She argues in particular against Zhmud’s view that the ritualistic precepts do not correspond to concrete practice. She says that the precepts not only ritualize the life of the Pythagoreans but also allow them to recognize the divine in this world and understand the cosmos in light of the journey the soul must make to return to its original divine state. These oral maxims of the master (known as *acusmata* = “things heard”) are thus not “a hotchpotch of superstitious precepts” full of absurdities, as scholars such as Zhmud suggest, but aim at control over one’s acts and purity. Nor would they have been cause for scandal in late-sixth-century Magna Graecia. She

argues that the attempts to downplay the *acusmata* both in antiquity and in modern scholarship are part of a tendency to normalize Pythagoras and the Pythagorean way of life.

Gábor Betegh explores the religious dimension of Pythagoreanism highlighted by Gemelli Marciano by comparing it to another controversial Greek religious movement: Orphism. He notes that in late antiquity the relationship between Pythagoreanism and Orphism was largely unproblematic. Pythagoras was initiated into Orphic mysteries and derived his metaphysics and theology from Orphism. Authors of the fifth century BC, on the other hand, while perceiving an affinity between Orphism and Pythagoreanism, were much less clear on which way the influence ran, and many regarded Pythagoras as the central figure. For Betegh the central difficulty in determining the relationship between the two movements is the ultimate impossibility of defining Pythagoreanism or Orphism. For example, the common assumption that Pythagoreanism and Orphism share a belief in metempsychosis and the practice of vegetarianism is problematic. Vegetarianism appears not to have been a core feature of Pythagoreanism, so that Pythagoreans could participate in the sacrificial ritual of polis religion. Hardcore Orphics may have practiced it, but many initiates into Orphic rites did not. Evidence from Plato suggests that Orphics believed in metempsychosis, but the archaeological evidence for Orphic and Bacchic cults provides no unambiguous evidence for it. There is clear evidence for Pythagoras' belief in metempsychosis but none for the most important early Pythagoreans, such as Philolaus and Archytas. Betegh concludes that just as Greek religion as a whole is pluralistic and there is much local variation so also there is a great variety among Orphics and Pythagoreans. In this regard he seems to support Zhmud's pluralistic interpretation of what it means to be a Pythagorean. One common feature that Betegh finds in both Orphic texts, such as the Derveni papyrus, and Pythagorean texts, such as the fragments of Philolaus, is an attempt to take concepts derived from natural philosophy and enrich them with religious meaning. Philolaus' central fire is part of an astronomical system that can explain many of the phenomena, as Graham shows in his chapter, but it at the same time brings with it the religious connotations of the hearth of the household and the state. This methodology reinforces the idea that there need not be any antagonism between Pythagoreanism and traditional religion, as Gemelli Marciano also suggested in her chapter. Pythagorean taboos can be seen as an additional layer on top of traditional practices and not in conflict with them. The Pythagoreans do not criticize religion from a rationalist

standpoint as does Xenophanes, nor do they attempt to provide an alternative mythic account as do the Orphics; rather they give new significance to traditional religion. Pythagoras' presentation of himself as the Hyperborean Apollo may be emblematic of this.

One of the most intriguing things about Pythagoreanism has always been that it appears to have both a strong religious and also a strong mathematical and scientific dimension. **Reviel Netz** combines a survey of the most important evidence for early Pythagorean mathematics with an innovative new way of looking at the history of Greek mathematics and the position of Pythagoreanism in that history. He suggests that there were two networks that accounted for most progress in Greek mathematics, one in the fourth century and one in the third. The central figure in the earlier network was Archytas. In contrast to Zhmud's approach in Chapter 4, he emphasizes that the evidence for Pythagorean engagement in mathematics proper prior to Archytas is negligible; on his preferred model Netz suggests that most supposed early Pythagorean work in mathematics, including the "Pythagorean theorem," was projected back onto the earlier period in light of the situation in the fourth century and the prominence of Archytas. He emphasizes, moreover, that fourth-century mathematicians who treated Archytas' approach to mathematics as a paradigm by no means therefore embraced Pythagoreanism as a philosophy. Netz admits that the sources are perilous and that his model is not the only possible one. The central question raised by his investigation is how important and influential Archytas was. His preferred answer applies Bertrand Russell's description of Pythagoras as "one of the most important men who ever lived" to Archytas instead, thus making him an even more prominent figure than is suggested by Schofield in Chapter 3. Netz also provides a new suggestion about one of the most puzzling figures in earlier Pythagoreanism, Eurytus. He argues that Eurytus was not, as has often been supposed, naively creating pebble mosaics of individual things in order to show the number (of pebbles) that constituted them (this traditional view is followed in a slightly modified version by Zhmud, Chapter 4, section 10, pp. 108–9). He was instead manipulating counters ("pebbles") on an abacus to demonstrate the numerical basis of things.

Pythagorean mathematics had its greatest influence on Pythagorean philosophy as a whole through harmonics. In his discussion of Pythagorean harmonics, **Andrew Barker** does not begin with Pythagoras himself, initially because of problems with the sources, but in the end because, so Barker concludes, Pythagoras did not contribute anything to the science of harmonics. The story of his discovery of the ratios that govern the