INTRODUCTION

Today the name of Pythagoras conjures up, at best, only the theorem attributed to him. Yet his impact on the history of civilization was significant. This book tells the story of how this ancient sage, who left no surviving writings, was revered and even imitated some two thousand years after his death. Similarly to the case of Christ, who also left no writings, a steady stream of thinkers wrote about Pythagoras after his own time and came, increasingly, to be influenced by him. Paradoxically, it would appear that the further away in time scholars lived from when Pythagoras was born (ca. 570 B.C.), the more intense their esteem for him became. By Renaissance times he had come to be identified as an ideal ancestor of scientific investigation, a prophet of Christianity, and an authority on morality and the social good. It was perhaps *because* Pythagoras left no writings that he could be appreciated by many different people in many different ways.

To those of us who have followed, in a previous volume,[1] the reputation of Pythagoras and the various ways in which the admiration of his followers was expressed throughout Antiquity and the Middle Ages, the high regard in which he was held by the end of the medieval centuries is clear. Yet at no time in history were scholars more fascinated by Pythagoras than in the Renaissance. Surprisingly, the remarkable acceleration of interest in him and in the ideas believed to have originated with him that took place at that time has not yet been the subject of a comprehensive study focussed on the visual arts.

This volume will examine the critical fortune of Pythagoras and the ideas attributed to him by those who admired him in the Renaissance. This surge of interest was not so much for discovering the facts of his life as it was for find-ing his unique fame as a divine polymath useful in expounding a new cultural language. In an age when artists and scientists were not separated as they are today, this new language could be and was, as this book will show, disseminated in the visual world. From about 1394, when the first teacher of Greek arrived on Italian soil from Constantinople and the first Italian humanists (that is, men of learn-ing) journeyed to the East in the hunt for precious Greek manuscripts, its pages

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will carry us to the early 1600s when, in giving birth to a new appreciation for observational evidence, the "Scientific Revolution" of the seventeenth century overtook the lure of classicism and relegated Pythagoras to the more distant realm of romantic imagination.[2]

The great fondness for Pythagoras in the Renaissance (essentially the fifteenth and sixteenth centuries) was largely due to the introduction of the study of Greek in Italian cities. It was also due to the long history of his previous approval by Christian authorities. Among those early Christians who had admired him were Clement of Alexandria, Saints Jerome and Augustine, the influential monk Cassiodorus, and the erudite bishop of Seville, Isidore. Pythagoras was revered by these scholars, who were perceived from early medieval times as disseminators of classical and Christian truth, as well as by later scholars in the Middle Ages as the first to have recognized the immortality of the soul. All saw him as an authority on morality. Because of the history of their consistent approval, Pythagoras continued to be admired in the Renaissance world as he had been in the Middle Ages.

For the Renaissance Pythagoras and what he stood for were very much alive. Ideas evoked by his influence were not separated, as they are today, into specialized disciplines. Rather, inspired by his memory, they formed part of a general background of thought based on the fundamental importance of the four elements (earth, fire, water, and air) to all living matter. According to this scheme, in which mathematics was the handmaid of the "science of the divine," the ancient significance of Pythagoras was rediscovered, raising his status among the thinkers of the ancient world because his inspiration had ignited the thought of the others.

The ancient threads that make up the thought of Pythagoras's followers were remarkably important for by the end of the Middle Ages they had survived sixteen centuries virtually intact, especially in the Greek world. This complex skein of thoughts came to be known by the general term Pythagoreanism. As we shall see, it shaped the ideas, and often also the lifestyles, of Renaissance thinkers. They conceived of "true" wisdom as a composite of intellectual knowledge, piety, and moral discipline – an ideal similar to that of ancient Pythagoreans for whom the concept of wisdom meant both factual knowledge and divine insight. Some were intellectuals who pondered number and mathematics; others thought it suitable to practice vegetarianism and frugality; yet others were intrigued by both. Old as were the origins of the beliefs they recalled, these provided an avenue for welcoming many interests still regarded as "modern" today – including peace, harmony, concord, ethical conduct, astrology, frugality, meditation, altruism, alternative medicine, the acceptance of women into the

Academy, and vegetarianism along with other dietary taboos. The written evidence from those who lived in the centuries of the Renaissance and the visual evidence left by contemporary architects and artists are compelling. Together they suggest an important story.

Renaissance thinkers were fascinated by the ancient literary and mathematical works that came, along with works of natural philosophy, into their hands. But they did not read them to construct verifiable positivistic theories about the past. Rather they used these works for their inspirational value. Those in the Renaissance who responded to the voice of Pythagoras through his representatives from the past liked what they heard. They used those ancient messages to articulate and create a unified world of their own design, to broaden Christian concerns, and to create a new idealism based on the concept of Pythagorean harmony. Thus was the muffled voice of Pythagoras greatly amplified in the Renaissance, when he became immensely influential.

The aim of this book is to describe how this happened. Studying the various ways in which ancient ideas connected with him were disseminated and transposed into new formulations will help us understand the role Pythagoras and his followers played in the development of Renaissance culture. As they passed from generation to generation, these ideas evoked an essential unity in patterns of belief similar to those Pythagoras was believed to have preached. The translation of this highly appreciated inheritance into a search for a novel language, one that would invest even the most Christian of themes with classical authority, was more intense in the Renaissance, when the two frequently merged, than in the Middle Ages when ancient themes were often relinquished in favor of Christian ones. The many varied aspects of Pythagorean thought – especially in arithmetic, geometry, and music – suggest a common goal: finding harmony. These ideas are particularly evident in the visual arts, where this ancient system of meanings could be, and was by some, especially architects and painters, transposed into fundamentally new concepts of perfection.

The path for my study of this exceptional evolution of thought has been paved by the seminal research of scholars who have provided us with a framework within which to view the significance of Pythagoras and the doctrines attributed to him.[3] François Lenormant was, in the mid-nineteenth century, the first to see the essential unity in the presumed teachings of Pythagoras. In an impressive number of works, Franz Cumont demonstrated, in the first half of the twentieth century, how a knowledge of Pythagorean thought could enhance our understanding of the iconography (subject matter) of ancient Greek and Roman art. Classical art was, of course, important for the Renaissance, when its Pythagorean connections appear to have been better understood than they are

now. A philosopher herself, Cornelia de Vogel displayed great wisdom in arguing, in the 1960s, that Pythagoras could not be properly understood exclusively in terms of philosophy but must be studied in terms of his larger social influence.

In the later twentieth century, S. K. Heninger explicated the significance of Pythagorean thought for poetic literature of the Renaissance. Michael J. B. Allen demonstrated the richly interwoven influences of Platonism and its multifaceted impact on Renaissance philosophical thought. Valuable research on the influence of Pythagoras in Florence has been accomplished by Christopher Celenza. In his masterpiece on architectural principles in the Renaissance, Rudolf Wittkower speculated that aesthetic theories in Renaissance building practice were connected with other manifestations of the mind, such as music, science, and mathematics. Though he perceived that number was important for understanding Renaissance architecture, he was handicapped by his conceptualization of numbers in the modern way, as cold integers, rather than in the Pythagorean way, as warm symbols that had character and mysterious meaning. André Chastel pioneered the modern study of the rapport between Florentine late fifteenth-century art and contemporary intellectual currents. George Hersey was the first to propose that Pythagorean ideas were influential on Renaissance architecture by showing their fundamental importance for the new architectural creation known as the Renaissance palace. To date, this work remains unique in its impact on interpretations of Pythagoras in the Renaissance. The work of J. V. Field, though not formally associated with Pythagoreanism, should be acknowledged because it studies, in an insightful and learned way, the relation between mathematics and art in the Renaissance. Though her work concerns times later than the Renaissance, Eileen Reeves wrote an exemplary analysis that was the first to seriously probe the association between astronomy and painting. Other scholars in our times have made important contributions to our knowledge of Renaissance philosophical and scientific thought. These include, to name but a few, Brian Copenhaver, Allen Debus, James Hankins, John Monfasani, Pier Daniele Napolitani, Paul Lawrence Rose, Wayne Shumaker, and Pierre Souffrin.[4]

Indeed, it is now time to enlarge the format of these discussions and to look at the big picture of Renaissance Pythagoreanism. This will, I believe, reveal that consciously or not the legacy of Pythagoras opened up entirely new vistas for mind and eye (in writings as well as in architecture and art). These were intertwined, forming the last – and perhaps the grandest – chapter in the relevance of Pythagoras to the history of civilization and, especially, to Western culture.

Before beginning our journey, which follows the fortune of Pythagoras and the dissemination of his ideas in the Renaissance, it will be useful to describe, in brief, the very ancient roots of the multifaceted "worldview" that his memory evoked and its persistence – indeed, its expansion and development – from Antiquity through the Middle Ages to the dawn of the Renaissance.

INTRODUCTION

Owing to the absence of documents from his own time, a true biography of Pythagoras cannot be written. However, the history of his importance can be evoked based on surviving fragments of works written by those who knew him or had direct knowledge of him. These help us to begin to reconstruct a lost "history," largely that of his reputation.

The surviving words of those who knew and followed Pythagoras in those first generations of his influence speak forcibly of the earliest evidence we have about him – his compassion for animals, his belief that all living beings have souls, his wisdom, and his highly original attempts to introduce the idea of order in the universe. This order enunciated a "law" of contrariety, that of the existence of interacting opposites. In the face of their intrinsic conflict, this interaction found refuge in a middle ground. This was based on the idea that, in making continuous reparation to each other, the four elements established the perfect balance on which the lives of humankind should be modeled. Among the most famous early admirers of Pythagoras were Empedocles of Agrigento, Philolaus of Croton, and Democritus of Abdera. Ancient testimony from these and even from those who, like Heraclitus of Ephesus, may have been his rivals, is unanimous in suggesting that one side of Pythagoras was dedicated to scholarship while another side was occupied with the supernatural – that is, with the mysterious forces of the universe, which some associated with magic. Whether Pythagoras specifically taught metempsychosis – transmigration of the soul – as a doctrine is not clear. However, that he believed that the soul was immortal and could expect to live eternally is clear.
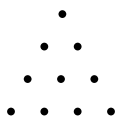
Inevitably, the historical portrait of Pythagoras in Antiquity fades with the passage of time. Correspondingly, a legendary Pythagoras takes over in the writings of those who aimed to reconstruct his life and teachings. These reconstructions, too, are history, for they established the reputation of Pythagoras as it was to be heard by Renaissance ears and, thus, passed down to us.

Though increasingly mythologized in the later centuries of Antiquity, the reputation of Pythagoras does not change his essential historical image. He was, and continued to be, above all, a humble sage. An important new element was, however, introduced during this time. Pythagoras came to be regarded for mathematical discoveries. This was based on a suggestion originally made by Philolaus, one of his earliest followers, that Pythagoras was the first to identify the geometrical solids, or polyhedra (the hexahedron or cube, the tetrahedron or four-sided pyramid, the octahedron, the dodecahedron, and the icosahedron – so named according to the number of plane faces they possess). Because Plato discussed these in his *Timaeus*, a later work, they came to be known as "Platonic solids." Pythagoras's favorite plane geometrical form, it was deduced in late Antiquity, was the circle. Because the circle has no perceivable beginning or end, it stood for the purest divine and eternal continuity. His favorite solid geometrical form was its three-dimensional counterpart, the sphere. Because the sphere displays equality

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at all points of its surface to and from its center, it was even more favored by him, for it could contain any of the five geometrical solids.

One of these solids, thought to have been of particular importance to Pythagoras, was the cube. It could be described in two ways. As a regular geometrical solid, it had six faces or equal square sides. It could also be described numerically, based on its equal dimensions, as the third power – or cube – of any number (e.g., 4 x 4 x 4 = 64). Awe for this concept was so great that at least one Roman, the architect Vitruvius, wrote that Pythagoras and his followers had composed "books" about the cube, celebrating its primacy.[5]

Another geometric solid particularly admired by Pythagoras and his followers (especially Anatolius, Nicomachus of Gerasa, and Philo of Alexandria) was the pyramid. Having four sides at its base, it symbolized the basic perfection of the number 4, the number commemorating the importance of the four elements. The significance of this number was memorialized in an equilateral triangular display of the first four numbers. This array brought the total of its component integers to 10 and was represented by the famous symbol attributed to Pythagoras, the *tetraktys*:

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Aëtius, in the first century A.D., described Pythagoras's *tetraktys* as the source of all nature because it was based on the quaternity, or "fourness," of the elements; a century later, Theon of Smyrna called it "the holy *tetraktys*," for it represented the cosmos, now symbolized by the number 10. In short, the *tetraktys* and the decad together came to be a compendium of Pythagorean mysticism believed to contain the ratios of cosmic harmony.[6] Thus was Pythagoras understood to have pondered geometry.

More important the mathematics attributed to Pythagoras in the centuries following his death introduced the idea that number could explain all features of order in the universe. Thus he came to be universally admired as an arithmetician. But arithmetic was not a stand-alone science (as we now think of it) in Antiquity; rather it and theology were bound together into a form of knowledge that might more properly be called "arithmology" – a knowledge that was both scientific and mystical. Because the seven strings of the lyre reflected the number of the celestial bodies (the five planets known at the time plus the sun and the moon), this instrument was considered ideal for audibly confirming the music of the spheres that Plato had first alluded to and Cicero and Macrobius had later described. It was during Roman times that the geometrical theorem now known as the "Pythagorean theorem" (the square of the hypotenuse of a right triangle is equal to the sum of the squares of the other

two sides, or $c^2 = a^2 + b^2$) was first, to our knowledge, attributed to Pythagoras, by Vitruvius.[7]

Other new elements make up the legendary accretions to the life of Pythagoras developed during late Antiquity. These include his associations with moral teachings, dietary restrictions, self-discipline, the practice of silence, the abhorrence of luxury, the pursuit of simplicity, the exercise of piety, the use of secrecy and enigma, and the practice of healing. None of these conflicted with the original aim of Pythagoreans to find and define order in the universe. That concept had simply been enlarged to include the Pythagorean commitment to teaching human beings how to put order in their lives. In essence, Pythagoras's ancient reputation had not changed; these accretions only enriched it.

This enrichment included other elements that are clearly legendary though in some cases (starting as far back as Aristotle in the fourth century B.C.) they had been reported by exacting, scientific scholars. Pythagoras worshipped primarily one god (Apollo), who, as his divine father, had entrusted him, at birth, with the mission to teach morality, purity, and piety to all humankind. Pythagoras had a golden thigh, which he displayed on selected occasions, "proving" his special status as the son of a god. He cured emotional sickness through music therapy induced by playing his lyre with a slower rhythm and longer, stressed (or "spondaic"), beat. This enabled him, ancient sources tell us, to calm frenzied behavior. Numerous other legends, repeatedly reported by many writers in late Antiquity, served as symbols of his divinity.

Such marvelous stories were accepted over time as true, leading some to deduce that because Pythagoras was the son of a god (Apollo) he was a god himself. In late Antiquity, it was thought by such writers as Neanthes Satyrus and Hermippus that this divine man and his followers had been persecuted and died tragic deaths. This idea gave the impression that they had become martyrs. The accumulation of miraculous events attributed to Pythagoras and his followers reached their height in the years of early Christianity. While these accounts served as inspiring symbols to initiates, outsiders such as Lucian of Samosata found them puzzling or even ludicrous.[8] However, it was thought by some that as a divine being who had died a martyr's death, Pythagoras was reborn after having visited Hades and resurrected from the dead. It was this Pythagoras that came to be known to the Roman world. Following Pythagoras's influence in Italy, his divine father, Apollo, the inventor of music and the arts and the master of Parnassus and the Muses, moved from the Greek to the Roman world, keeping his name intact. There Apollo attained a unique popularity as a god of healing. His son, Pythagoras, late-Antique writers explained, was devoted to the nine Muses, who were in charge of unison, harmony, and rhythm, the ingredients that make up concord.[9]

Those who wrote about Pythagoras in late Antiquity came from such disparate areas as Syria (e.g., Nicomachus, Porphyry of Tyre, and Iamblichus of Chalcis),

Alexandria (e.g., Theon of Smyrna, Aristobulus and Philo of Alexandria), Athens (e.g., Proclus), and Rome (Cicero and Varro, among others). Whereas the Syrians tended to emphasize the mystical traits of Pythagoras (divinity and the mysticism of number), Alexandrians stressed his interest in arithmetic and were interested in Pythagoras's connection with Judaism. The *Book of Wisdom*, an apocryphal work believed to have been written by Solomon himself (though it is now connected with Philo), proclaimed that God had created all things according to number, weight, and measure. Romans, particularly Cicero, saw Pythagoras as a great unifier and a builder of community and harmony.[10]

Pythagoras was also noted, especially in late Antiquity, for his ability to practice magic. Interest in this tradition was especially vivid among the Druids. Perhaps remembering their Greek origins, this learned priestly class of Gauls were thought, in Gallo-Roman times, to have taught Pythagorean doctrines. Playing their lyres, they practiced the well-known Pythagorean arts of divination, prognostication, and medicine as they melded into French medieval culture.[11]

Most astonishing, perhaps, is the consistency of medieval traditions about Pythagoras. Though in the Middle Ages there was a tradition of suspicion regarding mathematics (and other forms of esoteric knowledge) as an occult, dark, art, Pythagoras was valued by many who believed his arithmetic had played a pivotal role in understanding the universe. This resulted in the rising importance of the study of geometry and proportion and of the idea that opposing or different concepts instinctually seek mediation, or union, with their counterparts. Among the many routes by which classical learning about Pythagoras was transmitted to the Middle Ages, the most crucial manifested themselves early on. Authoritative writers such as Macrobius, Boethius, and Isidore of Seville sought to explain the cosmological harmony for which Pythagoreans had come to be famous. The tradition of learning established by their works was extremely influential throughout the remaining medieval centuries. Its inspiration led to mathematical interpretations of the universe and the assignment of numerical symbolism to religious concepts by Christians and Jews. Pythagoras was especially revered in the early Middle Ages as the founder of the quadrivium, the four disciplines (arithmetic, geometry, music, and astronomy) that formed the foundation of the Seven Liberal Arts (to which the trivium – grammar, rhetoric, and dialectic – were added). These were celebrated in a bold and florid drama about them concocted by Martianus Capella, which would become required reading for every medieval schoolboy. Now the number 7, revered by Pythagoreans, and memorialized in the Seven Liberal Arts, was put under the protection of none other than the Blessed Virgin.[12] Numbers and geometry were of the greatest importance to medieval writers, not only because scholars such as Boethius had said as much, but because Plato's *Timaeus*, the only complete work of Plato's known in medieval times, was a work they respected.

Here Plato had explained the unity of God and the creation of the world by this divine master craftsman in a way that Christians could follow because the Church Fathers had accepted it. Plato stipulated triangles to be the essential ingredient of the five basic geometrical solids that compose the universe. All geometric plane figures can, he suggested, be analyzed as triangles. Thus did the triangle come to be regarded as basic to the construction of the universe. The *Timaeus* proved that all parts of nature were interconnected through geometry and number in the great sphere of the universe. Behind Plato's god, who laid out the order of the universe from the primeval chaos previously described by Hesiod into a functioning harmony of celestial bodies moving in fixed proportions to one another, was Plato's teacher and inspirator, Pythagoras.[13] Plato's masterpiece thrilled not only Western scholars, who read it in Latin translation, but also Eastern scholars in the Byzantine world, who read it in the original Greek. It would also thrill Renaissance humanists anxious to replace the medieval scholastic obsession with Aristotle with the more unified worldview advocated by Plato in the *Timaeus*, a work known since Antiquity and through the Middle Ages as his most Pythagorean work. The power of Plato's resurgence in the Renaissance was so great that modern concepts such as "Platonism" and "Neoplatonism," which have so concentrated our attention on Plato's methods, ideas, and influence, tend to overlook what Renaissance thinkers knew – that behind Plato was Pythagoras.

Meanwhile, an alchemical tradition, one originating in Antiquity but ever more pronounced during the Middle Ages, connected the transmutation of base metals into gold with the subterranean world that had, supposedly, been inhabited by Pythagoras. This tradition regarded Pythagoras, who had discovered the immortality of the soul, as an authority in a world where even stones were believed to have souls.[14] In the world of medieval divination, inspired in great part by the Druids in France, a considerable literature developed around the authority of Pythagoras as a master prognosticator.[15] Those who knew the secrets of interpreting number – especially medical doctors and priests – could make the necessary predictions involving life and death. Thus everyday people were also acquainted with Pythagoras. Clearly, his high standing in medieval times prevailed in the occult as well as the intellectual world.

It was this expanded world that the Renaissance would inherit when it found its ideal ancestor in the pure soul of Pythagoras. Dante very much admired Pythagoras, just as Renaissance thinkers would admire Dante. Petrarch too thought highly of Pythagoras. During the Renaissance many people could even visualize Pythagoras, because a steady stream of portraits of him survived from Antiquity and the Middle Ages. Pythagorean influence had helped Gothic architects develop the mystical numerical symbolism of their cathedrals, which, as did the oldest surviving Pythagorean temple now known as the Subterranean Basilica at Porta Maggiore in Rome, faced eastward.[16]

This rich inheritance consisted of many pieces that had to be fitted together. The initial steps toward the process of re-presenting Pythagoras in the Renaissance would be inspired by the burgeoning interest in all things Greek. Indeed, the classical tradition had not died out, as is often assumed; on the contrary, it was continued into the Early Renaissance and enriched and accelerated when Greek scholars met their Latin counterparts on the soil of Italy.

This book is, in accordance with the nature of the topic I am studying, divided into thirds. The first, comprising Chapters 1–3, studies the reputation of Pythagoras, the man, as developed in the Renaissance. The second, consisting of Chapters 4–6, examines the testimony and ideas of those authors active in the fifteenth and sixteenth centuries who were interested in Pythagoras's ideas or that suggest that these writers were following what were thought to be his teachings. Because some of them may have actually written about Pythagoras the man, there will, inevitably, be some who reappear in these pages. On the other hand, there are many more who appear to have subscribed to some (but not necessarily all) of the concepts attributed to him by tradition. Both extremes, and others in between, will be considered here. The final part, made up of Chapters 7–9, selects some of those creations in the visual arts of the Renaissance that appear to suggest the impact or inspiration of Pythagoras and what were thought to be his ideas. This part first describes the portrait tradition of Pythagoras in the Renaissance, providing evidence that he was well known in the artistic world. In the pages that follow, evidence suggesting the impact of his ideas on visualizing form, space, and design in Renaissance art and architecture will be offered for consideration. The association of ideas presented in these chapters suggests visual corroboration that the tentacles of Pythagoreanism, as first rediscovered in Italy, spread in the Western world – an extensive area that included Germany, Spain, France, and England. A final chapter summarizes the significance of Pythagoras and the widespread influence of doctrines associated with him from late medieval to early modern times.

The first of two appendixes will, it is hoped, give the reader an idea of the quantity and variety of ancient literature referring to Pythagoras that was collected in Renaissance libraries. The second will provide the reader an opportunity to understand the importance of the "moral" side of Pythagoreanism in the Renaissance with the first translation into English of an Italian Renaissance publication of the *Symbola*. This was an accretion of moral precepts thought, in the public memory, to have been written by Pythagoras himself. These precepts explained to contemporaries how they might put order in their lives reflecting the order he had seen in the universe. Pythagoras's moral authority had had a long and consistent history in Antiquity and the Middle Ages and was to be particularly important in the Renaissance. This fact has been neglected by recent