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Pythagoreanism

WHILE THE PYTHAGOREAN SCHOOL OF PHILOSOPHY had a long and permeating but varied influence in the ancient world, its founder himself, from whom its name was taken, is a virtually legendary figure. A few facts about him can be accepted as historically probable, however. He was born on the island of Samos about 580 B.C. Like many another ancient philosopher he journeyed in his youth to Egypt, where for an indefinite number of years he pursued studies in astronomy, geometry, and theology under the tutelage of Egyptian priests. After further extensive travels, which some ancient commentators say took him as far east as India (a claim which lacks adequate support, however) he returned to his native insular province only to find it in the grip of a dictatorship. So now, as a man of mature years, he migrated to Crotona in southern Italy, probably accompanied by younger men who had become his disciples.

The city of Crotona, which had been founded as early as the eighth century B.C. by Greek colonists, possessed a good natural harbor, which made it a center of sea trade and thereby economically prosperous. Moreover it was said to possess the best school of medicine in any of the Greek colonies of the west. In this attractive location Pythagoras established a school of his own, distinguished by its pursuit of higher studies in mathematics,

astronomy, music, metaphysics, and polydaemonistic theology; by a disciplined community life, which included both a daily regimen of activities and studies and the practice of non-possession by sharing unreservedly all the necessities of living; and by carefully guarded conditions of membership which nevertheless allowed (for the first time in history, so far as is known) the admission of women as members. Unfortunately the inhabitants of Crotona regarded the school as an intruder and its head as a dangerous wizard who was rumored to have a golden thigh and to possess various queer magical powers. Hostilities mounted, and at length when Pythagoras had become a very old man there was a mob uprising, which made a vicious attack upon the school, burned the buildings, and murdered or exiled the members.

The nature of daily living in the school, both its moral and its intellectual disciplines, can perhaps best be understood as an intellectualized development from earlier mystery cults such as the Eleusinian. The main Eleusinian practices involved two steps—purification and revelation, the ritualistic sea-bathing by boys undergoing initiation and the dramatic exhibition in a dark room of the sacred grain stalk in a flash of light. Granted that the ritual and the mystery had a symbolic character for the ancient Eleusinian worshipers, Pythagoras in taking over the basic pattern minimized the ritual and stressed the symbolic character of the religious formulations. Ritual gave way to purposively guided action. The practice of silence each morning, between rising from bed and the ascetically sparse community breakfast, was a means on the one hand of reawakening one's inner affinity with the divine, and on the other hand of exercising and strengthening one's power of memory by daily practice in recalling the ordered events of the preceding day, then of the day before that, and so on. Community meals, readings aloud, and the practice of sharing were at once a zestful part of daily living and a symbolic reaffirmation of the participative nature of life—the human soul's participation in the divine reality that envelops us and thereby in the aims and needs

of fellow members of the Pythagorean brotherhood. Within this harmonious social framework the higher studies—philosophical, mathematical, musical—were pursued, with the hope (and perhaps the occasional realization) of the ultimate Pythagorean aim—to hear in its full glory, and with an intuitive grasp of its hidden meaning, the Music of the Spheres.

MUSIC AND MATHEMATICS

The legend is that once while passing a blacksmith's shop Pythagoras was struck by the diversity of tones coming from within as the hammers hit the anvils. Investigating he discovered that a heavier hammer produced a lower pitch while a lighter hammer produced a higher. Since weight, as he already knew, could be measured on a balance, where smaller weights could be taken as units by which to measure a larger weight, he thus found in the smithy clear evidence of a working identity between musical intervals as heard and numerical relations as identified visually.

Furthermore it had been discovered empirically, by practicing musicians, that changes in pitch could be produced by pressing down a vibrating string or by blowing through different lengths of otherwise identical pipe. It remained for Pythagoras to discover that if one string is twice the length of a second of the same character, the result in acoustical terms is that unique harmony of sounds, the octave. Again, if the first string is made one and a half times as long as the second (that is, when the ratio of lengths is 3:2) the result is another harmonious interval, the fifth, or the *do-sol* relation. And a ratio of 4:3 in the lengths produces the *do-fa*, or the *sol-do* relation. Allowing for some looseness of early syntax we can understand the triumphant generalization at which Pythagoras arrived when he proclaimed the identity of music with number.

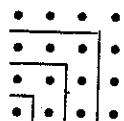
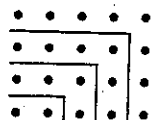
But Pythagoras did not stop there. To extend one's generalizations is tempting, and the musical generalization became broad-

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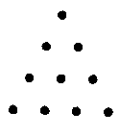
ened into a metaphysical one, which virtually came to serve as the badge of the school: that *All is number*. Research into the nature of number and its associated ideas was made the central theoretical discipline, with the result that the word *mathêmatika* (a neuter plural connected with *mathêma*, "learning," and so originally signifying "things taught and learnt") gradually became attached to the more restricted meaning which the word "mathematics" has carried subsequently.

As conceived and practiced in the Pythagorean school mathematics had a more qualitative character than has been involved in conceptions of that science since the seventeenth century. In the first place it was predominantly geometrical. A square number meant the area of a square erected on a given line, and a cube number meant the volume of a cube erected on a square; the notion of a fourth and of higher powers was therefore not entertained. Pythagoras discovered the determination of increasing dimensionality by an increasing number of points—that two points determine a straight line, that three points not on the same line determine a plane surface, and that four points not on the same surface determine a three-dimensional figure. Even when lines, areas, and columns were not in question, numbers were still conceived spatially by means of dots; which gave rise to the peculiar Pythagorean conception of masculine numbers, feminine numbers, and triangular numbers. The first two can be understood by imagining dots arranged in perpendicular rows and columns, regularly spaced, starting at a lower left corner and extending indefinitely upward and to the right. An important instrument called the *gnomon*, an L-shaped ruler, would be placed so as to cut off one dot at the extreme lower left. Let the gnomon then be moved step by step so as to cut off one more row and one more column at each step. On the first move 3 dots will be added to the original one, then 5 more, then 7, 9, 11, and so on. In the process the gnomon will move in a straight diagonal line, as it cuts off successively larger squares. The uniformity of direction

and the square perfection of the successive results were regarded as masculine characteristics; accordingly the odd numbers, since they operate in the process of geometrical creation and growth of regular squares, are called "masculine numbers." If now we start with two dots instead of one, and move the gnomon as before, there will be added successively 4 dots, then 6 more, then 8, 10, 12, etc. The resultant figures are oblong (imperfect approximations to the square), and the gnomon as it moves must change its direction, in an ever diminishing curve. Even numbers, therefore, since they produce this imperfect and varying result, are called "feminine numbers."

Masculine progression*Feminine progression*

There are also "triangular numbers" to be considered, the nature of which becomes evident from imagining the growing triangular shape that results when, starting with a single dot, two dots are placed under it, then three dots under that, then four, and so on.

The Tetractys

The triangle with a four-unit base was called the Tetractys, and was held in high reverence; as shown by the fact that Pythagorean initiates were required to swear their allegiance, including their promise not to reveal the secret mysteries of the Order, by the Oath of the Tetractys, which ran: "I swear by Him who reveals Himself to our minds in the Tetractys, which contains the source and roots of everlasting nature." Among the reasons for so high

a regard were these: that the number 4 represents justice, which is the most fundamental of human virtues and, some would add, is essential to the governance of the universe; that the numbers which the Tetractys contains determine respectively the point, the line, the plane, and the tetrahedron; that each pair of adjacent lines exhibits the ratio of one of the three main musical harmonies (1:2, 2:3, 3:4); that the units of the Tetractys add up to ten, the Decad, itself a sacred number on independent grounds; and that the Tetractys creates both masculine and feminine numbers—masculine when two adjacent lines are added together, feminine when one line is skipped in making a sum. Fanciful ingenuities of this kind made up a large part of Pythagorean number theory. Their interest for us lies largely in the evidence they give as to the central importance of the concept of number for the Pythagoreans; which helps to explain the intellectual bewilderment into which they were thrown by the discovery of incommensurables.

THE MYSTERY OF INCOMMENSURABLES

When the Pythagoreans spoke of number they were thinking of whole numbers and the ratios between them; fractions were conceived, properly enough, as ratios between whole numbers. A special ratio of whole numbers which Pythagoras had learned during his youthful pilgrimage to Egypt, was the 3:4:5 ratio as exemplified by the two sides and hypotenuse of a right-angled triangle. Later, as ancient tradition affirms, Pythagoras discovered how to demonstrate the general theorem (subsequently known as the Pythagorean Theorem) that in *any* right-angled triangle the squares erected on the two sides will have a combined area equal to that of the square erected on the hypotenuse; or (what is exactly the same theorem) that the square erected on the diagonal of a square has twice the area of that original square. Obviously the Egyptian 3:4:5 triangle offers a particular case of the general relational law. But another special case mainly drew the attention of the

Pythagorean number analysts, who like all Greeks found high virtue in symmetry—the case of the isosceles right-angled triangle, in which the two sides are of equal length. Here by the general theorem it is readily seen that the ratio of the larger square on the hypotenuse to the smaller square on either of the sides must be 2:1. But immediately the question arose for them: What is the ratio between the *length* of the hypotenuse and the length of a side? The fact that nowadays we can reply glibly by means of the symbol $\sqrt{2}$ fails to meet their problem; for the meaning of that symbol has been worked out subsequently during centuries of mathematical study, and it was the early Pythagoreans who inaugurated that study by posing the problem. Their question was whether any two whole numbers could be found that would give the exact ratio between the length of the hypotenuse (h) and the length of a side (s). If one approaches the matter empirically, without preconception, it might appear at first sight that h is about one and a half times s , but measurement will prove the estimate to be too high. The ratio 4:3 might next be tried, but here the estimate proves to be too low. As higher numbers and more refined ratios are tried, an experimenter eventually passes beyond the possibilities of verification by measurement; and for the early Greek experimenter, with his crude types of measuring instrument, that point must have been reached quite soon. Probably, then, in the early years following the discovery of the Pythagorean Theorem there was genuine questioning as to whether any numerical ratio between h and s could be found.

Then someone, whether Pythagoras or a disciple, discovered the deductive proof, later formulated by Euclid, that no such numerical ratio is possible. The result was consternation. It had been a basic tenet of the school that All is Number, and here for the first time was a demonstration that certain ratios between lines were incommensurate—could not be measured by reference to a common numerical unit. What was to be done? The Pythagoreans

in their bewilderment decided to treat the information as a top secret, to be revealed only to trusted members of the school who had taken the vow of silence; and when one of them, Hippasus, exposed the secret to outsiders, he was solemnly excommunicated from the Pythagorean fellowship, and a legend says that the gods then took a hand by causing him to perish at sea in a shipwreck.

COSMOLOGY AND ASTRONOMY

Pythagorean musical and mathematical conceptions found their highest expression in the cosmological doctrine of the Music of the Spheres. When Pythagoras declared that there is a universal harmony, a grand musical pattern, in the movements of the universe, he was expressing, in his own style of concrete imagining, a conviction that rational law governs the universe. For to the Pythagorean mind, it must be remembered, music was identical with number, and number in turn was conceived geometrically. Consequently what the Music of the Spheres primarily affirmed was the presence of a geometrical order among the motions of sun, moon, planets, and fixed stars. Since the circle, in its perfection and simplicity, made the strongest appeal to the unsophisticated mathematical sensibilities of the Greeks, the meaning of astronomical law became naturally affixed to it. There was no serious trouble in conceiving the observed movements of sun, moon, and fixed stars as basically circular, although the deviations between summer and winter required some explanation; but the apparent irregularities of the five known planets (Mercury, Venus, Mars, Jupiter, and Saturn) created a serious difficulty. At any rate, that some kind of geometric pattern must exhibit itself in all those movements was an article of faith for the Pythagoreans, maintained with religious conviction—partly suggested by experience, from observing the half-circle movements of sun, moon, and constellations, but in any case demanded as a guiding concept for the

rational interpretation of whatever astronomical phenomena might be observed. To Pythagoras it appears that such astronomical order was conceived both geometrically and musically—that is, by means of visual and auditory imagination combined—for it is recorded of him that on a few memorable occasions in his life he entered into the transcendent experience of actually “hearing” that celestial music.

The general number theory gave rise also to a more particular astronomical result. Adding the orbits of the five known planets to those of the sun and moon and that of the fixed stars gave a total of eight orbits, each of which must be conceived of as basically circular or as somehow explainable in terms of a combination of circles. Eight, however, was not a good Pythagorean number; the next good number above it was ten, the Decad. Two more revolving bodies had therefore to be found or postulated; the need was met by conceiving of the earth itself as a planet, revolving about the same center as that about which the sun and other planets revolved, and by postulating that behind the earth (on the side opposite to that on which the Greeks and all known peoples resided) there was a tenth revolving body which they called the counter-earth. A cosmic center had to be assumed which all ten orbits encircled, and this ultimate center was conceived as the Central Fire. Of course inhabitants of the known earth (i.e., Europe, near-Asia, and north Africa) were unable to see either the counter-earth or the central fire; and this inability was explained by supposing that the earth, while revolving around the central fire, kept its inhabited face turned away from the fire and the counter-earth, with the result that they were perpetually invisible to earth people. If the hypothesis seems a curious one to contemporary habits of thought, let it be considered that the Greeks, lacking telescopes, possessed no example of a body rotating on its own axis, whereas experience did show them one example of a revolving body keeping one face toward, and hence one face away from, the center of its orbit—namely the moon.

THE SOUL AND ITS DESTINY

To a degree and in a manner which it is difficult for a modern thinker to realize, trained as he is in the ways of specialism, the Pythagoreans regarded mathematical and astronomical studies as inseparable from moral and religious disciplines and from personal self-examination. Behind the practices of self-discipline and self-examination which were part of the daily life there lay a profound set of convictions about the nature and destiny of the soul.

First, the soul is immortal: it existed before what we call birth and will go on existing after what we call death. The present life is a sojourn, a temporary stage in a long pilgrimage; and the body (*sôma*) was likened to a tomb (*sêma*) in which they held that the soul has to live out a sort of shadow-life, a half-life, which is more nearly death than it is life. Starting from these premises a man's primary purpose will be, not a pursuit of the so-called goods which the present life offers, but a preparation, through self-discipline and self-harmonization, for the larger life into which he may be destined to enter hereafter.

However, the larger and hoped for life is not attained immediately and automatically after our departure from this life. Each soul is weighted down to a greater or lesser degree by its impurities and disharmonies, so that consequently it must (according to the ancient Orphic doctrine which Pythagoreanism took over) first go through an ordeal of purification and then be reborn into some other human or animal shape, in which it is given a new opportunity to meet the challenges of bodily circumstance and through them to purify itself for its ultimate destiny. This is the doctrine known as metempsychosis, transmigration, or reincarnation.

From the belief that we have lived before, and in better circumstances than now, an educational corollary follows. Learning in the present life is really recollection. The fundamental truths are

already known to us, in the depths of our unconscious selves, and the purpose of education should therefore be to stir these hidden parts of us into activity, rather than to impose truths upon them from outside sources. As the mind becomes meditative and withstands the corruptive influences of its everyday environment it becomes better able to behold and recognize the truths which, although they appear to be given by experience, are really already within each individual, awaiting the right stimulus and challenge to dislodge them.

Finally, it appears that the soul, both in the present life and hereafter, was regarded not so much substantively as functionally—not as a thing of gaseous materiality residing in the head or the heart, but as a harmony. The degree to which the harmonious music of the soul is realized determines the direction of its destiny and what other bodily sojourns it must undergo before it has purified itself of all unharmonious elements in order that it may become one with the great cosmic harmony which is the ultimate destiny of all existence.

The present chapter, unlike its predecessors, begins not with fragmentary quotations of the philosophers in question, but with a set of testimonia; for there are no extant fragments of Pythagorean philosophy earlier than those attributed to Philolaus (Sec. iv), who was roughly contemporary with Socrates. The *Symbola* (Sec. ii) and the *Golden Verses* (Sec. iii) represent important elements of Pythagorean moral and religious teaching; but coverage of the metaphysical doctrine is furnished only by the Testimonia (Sec. i). Probably the ratio of what can be known in relation to the whole body of teaching is smaller in the case of Pythagoreanism than in any of the doctrines that precede.

i. Aspects of the Doctrine

TESTIMONIA

FROM PLATO:

T 1. *Socrates*: As I conceive the matter, our eyes are designed to look up at the stars, while our ears are designed to hear the harmony of their movements; and these are kindred modes of investigation, according to the Pythagorean teachings. (*Republic* 530D)

T 2. *Simmius*: As you probably already know, Socrates, most of us [Pythagoreans] believe somewhat as follows about the soul. We say that the body is held together by the tensive relation that exists between the hot and the cold, the dry and the moist, and other such [pairs of opposites]; while the soul is a blending and attunement of those same elements when they are mixed in right proportion. Well now, if it is true that the soul is a harmony, then when the body gets unduly relaxed or tightened by illness or some other cause, it follows from our assumption that the soul, even if we grant it to be divine, must then necessarily perish, as happens in other cases of attunement, whether musical or involving some other activity of craftsmanship. The body, however, will continue to exist for quite a long while, until it either rots or is cremated. What reply, then, can you make to this argument that the soul, if it is a blending of bodily elements, will be the first thing to perish when what we call death occurs? (*Phaedo* 86B)

T 3. *Socrates*: Perhaps Euripides was right when he remarked, "Who knows if life be death and death be life?" I have

heard a [Pythagorean] philosopher say that in our present state we are really dead, that our body (*sôma*) is our tomb (*sêma*), and that the part of the soul in which the desires have their abode is of such a nature as to be blown to and fro—metaphorically in this life but actually after death. Some clever fellow; probably from either Sicily or Italy, making a play with words, called the soul a jar, because it can easily be jarred by persuasive words into believing this or that. The people who let themselves be persuaded without thinking are called “the uninitiated,” and he of whom I speak described the uncontrolled and unretentive part of their souls by comparing them to a jar full of holes, on the ground that they can never be filled and satisfied. Moreover in Hades, he said referring to the unseen after-world, the uninitiated will be dreadfully unhappy, for they will be constantly occupied pouring water from a leaky pitcher into a leaky sieve. He compared the souls of such persons to a sieve because of its leaky nature, whereby it is unable to retain anything because of its lack of purpose and its forgetfulness. (*Gorgias* 492E)

T 4. *Cebes*: But tell me, Socrates, why is suicide held to be unlawful? Philolaus, about whom you were just asking, has affirmed this doctrine in my hearing, and so have other [Pythagoreans]; but I have not quite understood the reason for it.

Socrates: You are troubled, I suppose, by the paradox that although a [good] man is better off after dying, he is not permitted to seize that benefit by an act of his own, but must await the hand of another? . . . Let me tell you of a doctrine which [the Pythagoreans] teach in religious secrecy, to the effect that man has been stationed here in a kind of prison, from which he has no right to release himself and run away. There is something profound in the doctrine which goes beyond my understanding; but at any rate I believe with them that the gods are our guardians, and that we mortals are justly in their possession. (*Phaedo* 61E)

FROM ARISTOTLE:

T 5. At the same time as the philosophers of whom I have been speaking [the qualitative pluralists and the atomists] or even earlier, the so-called Pythagoreans, who were earnest students of mathematics, were first developing it as a science; and by reason of this special interest they came to think of its first-principles as the first-principles of everything whatever. Accordingly, since by the very nature of mathematics it is numbers that stand first among the basic principles, it seemed to the Pythagoreans that they could discover in numbers, more truly than in fire or earth or water, many analogues by which to explain both existences and occurrences. For instance, they explained justice as a certain property of number [four, the square], soul and mind as another such [one, unity, the point], the “decisive moment” (*kairos*) as another [seven]; and they gave the same kind of interpretation to virtually everything else as well. Furthermore they observed empirically that the properties and ratios of harmonious musical tones depend upon numbers. Since they found, in short, that everything else, too, in its intrinsic nature, seemed to be essentially numerical, and thus that numbers appeared to be the ultimate meaning of everything that exists, they concluded that the elements of numbers must be the elements of everything, and that the visible heavens in their entirety consist of harmony and number.

Accordingly they collected and employed all the analogies they could find which would represent the relation of numbers and harmonies to the properties or parts of the visible heavens and even to the entire universe; and if they came up against any gaps in such analogies they would snatch at whatever additional notion they could find to bring an orderly connection into their total explanation. For example, since the decad [the

number ten, considered archetypally] is believed to be perfect, and to embrace the essential nature of the whole system of numbers, they conclude that the number of things existing in the sky must therefore be ten; but since in actuality there are only nine that are visible, they postulate the existence of a counter-earth as the tenth. The matter is one which we have dealt with in greater detail elsewhere. (*Metaphysica* 985b 22)

T 6. The elements of number, according to their theory, are the even and the odd, the former being unlimited, the latter limited. Unity consists of both, partaking of the nature of both even and odd. Number derives from unity; and numbers, as we have said, constitute for them the entire visible universe.

Other members of the Pythagorean school regard the first-principles as consisting of ten pairs of opposites, which they set forth in contrasting columns: limit vs. the unlimited, odd vs. even, unity vs. plurality, right vs. left, male vs. female, rest vs. motion, straight vs. curved, light vs. dark, good vs. evil, square vs. oblong.

Alcmaeon of Crotona seems to have developed his theory along the same lines: either he took the theory from them or they from him, for his expressions are quite similar to theirs. Like them he says that most things in human experience are found in contrasting pairs; unlike them, however, he does not give a definite list of such pairs, but contents himself with mentioning any examples that happen to occur to him, such as white vs. black, sweet vs. bitter, good vs. evil, and large vs. small. Concerning other significant contrasts he offers only indefinite suggestions, whereas the Pythagoreans specify both how many and of what nature they are. From both sources, then, we receive the teaching that pairs of opposites are the first-principles of things, but it is only from the Pythagoreans that the number and nature of them are specified. (*ibid.* 986a 18)

T 7. The Pythagoreans, having observed that the things presented to us in sense-perception have many attributes of number, leapt to the theory that existing things are numbers—not just in the sense that they entail numbers as something distinguishable from themselves, but in that they actually consist of numbers. And why so? On the ground that the properties of number are inherent in musical harmony, in the movements of the visible heavens, and in many other things besides. (*ibid.* 1090a 20)

T 8. The Pythagoreans, while maintaining the doctrine of duality [manifested in the table of opposites] as a basic principle, added this further notion, which is peculiar to themselves, that the limited and the unlimited are not entities of a different order, but that the unlimited and unity-as-such are the subject (*ousia*) of whatever is predicated. Which is why they consider number to be the substance (*ousia*) of all things. (*ibid.* 987a 13)

T 9. The Pythagoreans believe in a single kind of number, the “mathematical”—conceiving such numbers not as something abstracted [from the world of sense-experience] but as actual constituents of perceptible things. They even construct the entire visible universe out of numbers—not numbers in the abstract, but spatially extended units of magnitude. (*ibid.* 1080b 16)

T 10. The Pythagoreans held that being and unity are nothing else than the very nature (*physis*) of the thing itself—as though the “specific character” (*ousia*) of anything could be the same thing as unity and existence! (*ibid.* 1001a 9)

T 11. All reputable philosophers who have dealt with this type of physical question have discussed the problem of the Unlimited, which in one way or another they treat as a first-principle. The Pythagoreans, followed by Plato and certain others, do so in the sense that they conceive the Unlimited as a self-

subsistent entity (*ousia*), rather than as a derivative attribute. The Pythagoreans are peculiar in regarding the Unlimited as existing in perceptible things; and they add that what lies beyond the "heavenly vault" (*ouranos*) is the Unlimited.

Moreover, the Pythagoreans identify the Unlimited [in the sense of the indeterminate] with the Even. For the even series, when it is cut off [by successive positions of the *gnomon*], produces something unlimited. When we begin with the One and make successive additions of odd numbers [by moving the *gnomon*], the resultant series of shapes preserves a single form; but when we begin with an even number and make such successive additions of even numbers around it, the resultant shapes do not preserve any form (*eidōs*)—which is to say, they are [indeterminate, or] unlimited. (*Physica* 203a 2)

T 12. The Pythagoreans affirm the existence of a void, explaining that it comes into the "visible universe" (*ouranos*) out of limitless breath. It is the void that distinguishes natural objects from one another, by making a separation and division among things that are neighbors. This is true especially with regard to numbers, for it is the void that gives numbers their specific nature. (*ibid.* 213b 24)

T 13. A magnitude that is divisible in one dimension only is a line, divisible in two dimensions a plane, in three a body. There are no further possibilities, for three dimensions are all that exist, and to divide in three dimensions is all that can be done. For as the Pythagoreans say, the All and everything in it are determined by the number three, since beginning, middle, and end constitute the basic triad that is the number of the All. (*De Caelo* 268a 9)

T 14. In Plato's theory of participation the only original contribution is the change of name; for where the Pythagoreans say that things exist by imitation (*mimēsis*) of numbers, Plato prefers to say they exist by participation (*methexis*) in them. (*Metaphysica* 987b 10)

T 15. Those in Italy who are called Pythagoreans say that at the center there is fire, the earth being in effect one of the planets, which moves in a circle about the center and thus produces night and day. They hold the theory that there is another earth, behind and facing this one, which they call the counter-earth.

Moreover the Pythagoreans think it altogether fitting that the most lordly position in the universe, its center, should be well guarded. Hence they call the fire at the center the "watch-tower of Zeus"; by which name they mean to indicate that it is not only the center of space but also the center of matter and of life. (*De Caelo* 293a 7, b 2)

T 16. Moving in orbit about the center there is first the counter-earth, then the earth, and after the earth the moon. (From his lost work *On the Pythagoreans*)

T 17. They say that the soul is a sort of attunement (*harmonia*); for attunement is a synthesis and blending of opposites, and the body is composed of opposites. (*De Anima* 407b 28)

T 18. Pythagoras paired the virtues with numbers, but he did not clarify what he meant by that. (*Magna Moralia* 1182a 11)

T 19. To some, like the Pythagoreans, reciprocity is taken as equivalent to absolute justice; for they define the just as what is mutually reciprocal. (*Ethica Nicomachea* 1132b 21)

T 20. Evil belongs to the unlimited, the Pythagoreans think, and good to the limited. (*ibid.* 1106b 29)

T 21. The Pythagoreans put the One in the column of goods. (*ibid.* 1096b 5)

FROM LATER GREEK SOURCES:

T 22. Italian philosophy was begun by Pythagoras, a native of Samos, and son of Mnesarchus an engraver of gems. From

Samos he journeyed to the island of Lesbos, to become a student of Pherecydes, after whose death he returned to Samos. In his youthful eagerness for knowledge, however, he left his native land, and participated in both Greek and foreign mystery cults, undergoing all the steps of initiation. He went to Egypt, taking with him three silver bowls as gifts for the priests, and there he learned the Egyptian language—so Antiphon tells in his book *On Men of Outstanding Merit*. He gained admittance to the Egyptian sanctuaries, where he was taught the secret doctrines of the gods. He traveled also to the Chaldaeans and the Magi, and while in Crete he made the descent into the Cave of Ida in the company of Epimenides.

On returning to Samos he found that the government had been usurped by Polycrates. Consequently he embarked for Crotona in Italy, where he established a community and constitutional government for the exiled Greeks, who held him in high regard. They were about three hundred in number, and they conducted their government so well that it was in truth an aristocracy in the best sense. (Diogenes Laertius VIII. 1-3)

T 23. [At Crotona], as his reputation grew, he won many followers—both men and women from the city itself as well as many foreign princes and chieftains from the surrounding countryside. One of the local women was Theano, who afterwards became celebrated. No one knows what Pythagoras said to his followers, for silence with them was no casual matter. (Porphyry, *Life of Pythagoras*)

T 24. Those who committed themselves to the guidance of his doctrines acted as follows. They performed their morning walks alone and in places where there was appropriate solitude and quiet; for they considered it contrary to wisdom to enter into conversation with another person until they had rendered their own souls calm and their minds harmonious. It is turbulent behavior, they believed, to mingle with a crowd immediately on

arising from sleep. But after their solitary morning walk they would associate with one another to discuss the teachings and to exchange suggestions for improving the style of behavior. Then they would walk together, visiting temples and other worthy places.

Their next step was to care for the health of the body: some would anoint themselves for the race course, others would compete at wrestling in the gardens and groves or at high-jump with leaden weights in their hands, while others would practice the art of pantomime. Contrasting types of exercise were sought with a view to improving the strength and health of the body.

Luncheon was extremely simple, consisting of bread and honey; they did not drink wine during the daytime. In the afternoon there were further studies. As evening came on they again took walks—no longer singly as in the morning, but in groups of two or three; they would practice walking in graceful rhythm together, while they discussed the studies that had occupied them during the day.

After walking they bathed, and then assembled in a place where they ate supper in small groups, no group being of more than ten. Supper was regularly preceded by appropriate libations and sacrifices, and was brought to a close just before sunset. They drank wine, ate maize, bread and the various kinds of food that are eaten with bread, as well as herbs both raw and boiled. They ate the meat of such animals as were considered lawful.

After supper there were further libations, and then readings followed, the youngest reading what the eldest selected. When they were ready to disperse, a cupbearer poured out another libation for them, and the eldest would then discourse, on such questions as our duties to the divine and to the lower orders—to the daemons, to the heroes, and to parents and benefactors. They wore pure white night-garments and slept in pure white beds under light coverlets, avoiding those made of wool. By at-

tending to the state of their bodies they remained always in the same condition, not at one time lean and at another overburdened with flesh.

By such disciplines the Pythagoreans sought to arrange their lives entirely for the purpose of following God. They held that all things are possible with the gods, and that one ought to seek benefits only from the divine Lord of all. But since it is not easy for man to know what are the things in which God takes joy, they studied the art of divination, which is the art of interpreting the benevolence of God as manifested in the world.

Music, medicine, and divination were the sciences most highly esteemed by the Pythagoreans. They practiced the habit of silence, and were alert to listen. In medicine they studied the values of symmetry, of labor, food, and repose. On right preparation of food and the proper manner of eating it they placed much importance. They avoided incisions and burnings when they could. Some illnesses they cured by incantations; they considered health to be greatly benefitted by music when rightly employed.

To strengthen their memory the students began each day, on first waking up, by recollecting in order the actions and events of the day before; after that they tried to do the same for the preceding day, and so on backwards as far as they could go, taking care to make the order of recollection correspond with the order in which the events had actually occurred. For they believed that there is nothing more important for science, and for experience and wisdom, than the ability to remember. (Iamblichus, *Life of Pythagoras*)

T 25. The Pythagoreans used to marvel when they met with a city-bred man who had never seen a divine being. (Apuleius)

T 26. Aristotle says that the people of Crotona used to speak of Pythagoras as the Hyperborean Apollo. He adds that on a

certain occasion Pythagoras was seen by many people at both Metapontum and Crotona on the same day and at the same hour. And that during the games at Olympia he arose in the stadium and displayed one of his thighs, which was golden. (Aelian)

T 27. Pythagoras wrote nothing, as was also the case with Socrates. (Plutarch, *Lives*). None of the Pythagoreans have noted down anything in all the generations up to the time of Philolaus; he was the first, and he published those three well-known books which Dion of Syracuse is said to have bought at Plato's request for a hundred minae. (Iamblichus, *op. cit.* 199)

T 28. Although certain persons have spread the silly rumor that Pythagoras left absolutely no writings, that view is opposed by Heraclitus the physical philosopher, who declares emphatically: "Pythagoras, son of Mnesarchus, pursued his researches farther than anyone else. In his compilation of writings he concocted a queer wisdom of his own, which showed much learning but poor constructive ability." The remark is elicited by what Pythagoras had reputedly written at the outset of his supposed treatise *On Nature*, namely: "Now by the air I breathe and by the water I drink, may I never suffer blame for this work!" The fact is, however, that while the book in question commonly passes for the work of Pythagoras, it was really written by a Pythagorean named Lysis of Tarentum, who left the group and went to Thebes. Pythagoras himself had written three books—*On Education*, *On Statecraft*, and also one entitled *On Nature*. (Diogenes Laertius VIII. 6)

T 29. In accordance with Pythagoras' maxims, "Friends share all things in common" and "Friendship is equality," his disciples gave all their possessions into one common fund. During the first five years of discipleship they were under obligation to keep silent, listening to Pythagoras' discourses without

seeing him; but at the expiration of that time, on passing an examination, they were admitted to his house and to the sight of him. About six hundred auditors used to attend his lectures at night; and those who were privileged to see him would write to their friends congratulating themselves on their great good fortune.

The prohibition against killing animals and more especially against eating their flesh was based not only on the ground that animals share with men the privilege of having a soul. Such was the announced reason, but mainly why Pythagoras prohibited a meat diet was in order to strengthen his followers' power of will and accustom them to simplicity of life. Furthermore he wished them to restrict their diet to what was easily procurable, eating uncooked foods and drinking nothing but pure water; such, he believed, was the way to a healthy body and a keen mind. The only altar at which he worshipped was that of Apollo the Life-Giver, behind the Altar of Horns at Delos. What he placed on the altar as offerings, according to Aristotle in his *Constitution of Delos*, was uncooked cakes made of grain; he did not sacrifice animal victims.

Pythagoras had a wife named Theano, a daughter Damo, and a son Telauges who succeeded his father [as head of the school] and who, according to some accounts, became the teacher of Empedocles. Pythagoras died at the age of either eighty or ninety. The story of his dying at eighty fits in with his theory [of man's life as falling into four twenty-year periods]; but other accounts say that he lived to be ninety. It is told that he met his death in the following manner. While he was sitting with friends in his house at Milo a fire broke out. The blaze may have been started by resentful applicants who had been denied admission to the brotherhood, or maybe, as other reports have it, by citizens of Crotona seeking to preserve their government from Pythagorean domination. Pythagoras in

escaping from the fire was pursued by assailants. On finding himself in front of a field of beans he stopped, declaring that he would let himself be captured rather than walk across it, and that he would let himself be killed rather than reveal the secret doctrines. Whereupon his pursuers caught and slew him, and in the same uprising they murdered about forty of his disciples, which represented more than half of the inner membership. (Diogenes Laertius, VIII, *passim*)

T 30. The philosophy of which I shall now speak was first upheld by Pythagoras, sometimes called the Samian. His teachings are known as the Italian philosophy, because of the fact that in fleeing from the usurping government of Polycrates in Samos he settled in a city in Italy, where he spent the rest of his life. Astronomy, geometry, and music were combined in his scientific studies. After a careful study of the nature of number he declared that the universe produces musical sound and is put together by attunement; he was the first to show that the movement of the seven planets [including sun and moon] is characterized by melody and attunement.

He divided his disciples into two groups, which he distinguished as esoteric and exoteric. To those of the former group he entrusted the study of the more developed forms of science, to the latter the more moderate. He experimented with what is called magic, and it was he who first established the science of physiology.

What he principally taught about number was this. Number is the first-principle: it is unlimited and indefinable, and it contains within itself the infinite series of numbers. The decad, the perfect form of the sacred number ten, is present in the essence of each of the first four numbers, since they [when added] become ten. He declared that this sacred tetractys is the fountain which has its source in ever-flowing nature. In the tetractys all the numbers have their first-principle. (Hippolytus *Refutatio*)

T 31. In the first book of his work on the Pythagoreans Aristotle tells of their doctrine that while the universe is essentially one, it is permanently differentiated by time, breath, and the void, which are drawn from the Unlimited, and which distinguish the places where things are. (Stobaeus)

T 32. The Pythagoreans interpreted all antitheses in terms of their double column of opposites, the pairs of which stood for comparative goods contrasted with comparative evils. They confined the number of basic alternatives to ten, because the decad meant for them the whole essence of number. They regarded each of the ten contrasted pairs as revealing the shared nature of all of them. (Simplicius *Commentaria*)

T 33. In Alexander's *Successions of Philosophers* he has set down the following as Pythagorean beliefs which he found stated in some Pythagorean memoirs. The first-principle of all things is the Monad [unity]. From the monad there arises the indeterminate dyad [twoness in the abstract], which then serves as passive material to the monad, while the monad serves as active cause. From the monad and the indeterminate dyad there arise numbers; from numbers, points; from points, lines; from lines, plane figures; from plane figures, solid figures; from solid figures, perceivable bodies compounded of the four elements, fire, water, earth, air. These elements undergo full transformations into one another; they combine to produce a universe that is animate, intelligent, and spherical. (Diogenes Laertius, *loc. cit.*)

T 34. Aristotle in his work on the Pythagoreans says that for them the One partakes of the nature of both the odd and the even: for if you add it to an even number it produces an odd, and if you add it to an odd number it produces an even; which it would not be able to do unless it shared in both natures. For this reason they called it "the even-odd." (Theo of Smyrna)

T 35. One is the point, two is the line, three is the triangle, four is the pyramid. All are primary and are first-principles of whatever particular things are of their kind. (Speusippus)

T 36. It is said that when Pythagoras visited Zaratas of Chaldaea he set forth his views as follows: that from the beginning there have been two causes of things, father and mother; that the father is composed of light, the mother of darkness; that light contains as its elements the warm, the dry, the buoyant, and the swift, while the elements of darkness are the cold, the moist, the heavy, and the slow; that these two groups represent male and female respectively, and that of them the universe is composed. (Hippolytus, *loc. cit.*)

T 37. Some of the Pythagoreans, as Aristotle writes in his book about them, explain the eclipses of the moon by the interposition of either the earth or the counter-earth. (Stobaeus)

T 38. He [Pythagoras] conceives the soul as comprising three parts—reason, intelligence, and passion. The two latter are possessed by other animals as well, but reason is in man alone. The bodily seat of the soul extends from the heart to the brain: the portion that is in the heart is passion, while the portions located in the brain are reason and intelligence. Sense-perceptions are drops distilled from these. Reason is immortal, all else is mortal. The soul draws nourishment from the blood. The rational powers of the soul are of the nature of breath; they and the soul itself are invisible, in the same way that the air is invisible. [In one's early life] the veins, arteries, and sinews are the determinants of the soul. But when the soul settles down into itself and becomes strong, then rational thoughts and the exercise of deliberate choice become its determinants.

When cast out upon the earth [after death] the soul wanders in the air, like a body. Hermes is the steward of souls; he is called the Escort, Keeper of the Gates, and the Hermes of the Underworld, because it is he who guides the souls by land and

by sea to the uppermost region, whereas the impure are not allowed to come near to the pure nor even near to one another, but are bound by the Furies in unbreakable chains. The entire air is filled with [unembodied] souls which are called daemons and heroes. It is they who send dreams to mortals and portents of coming ills and blessings.

The most momentous thing in human life is the art of winning the soul to good or to evil. Salt should always be placed on the table and served with a meal, as a symbol and reminder of what is right; for salt preserves whatever it finds, and it arises from the purest sources, the sun and the sea.

We should be equally attentive in our worship of gods and of heroes. Worship of the gods should be performed in pure white robes, in reverent silence, and after purification. Heroes should be worshipped only after midday. Purification consists not only in ritual cleansing and baptism, but also in avoiding pollution by abstaining from animal flesh, beans, and other forbidden foods, and observing all the other religiously and ritualistically required abstinences.

These are among the things which Alexander reports having found in a scroll of Pythagorean memoirs. (Diogenes Laertius, *loc. cit.*)

FROM LATIN SOURCES:

T 39. I am not disposed to approve of the practice which tradition ascribes to the Pythagoreans, who, when questioned as to the grounds for some assertion which they were putting forward in a discussion, are reported to have replied: "Himself has said so" (*Ipse dixit*), "himself" being Pythagoras. Thereby they sought to give weight to an opinion already decided, by making authority prevail unsupported by reason. (Cicero *De Natura Deorum* I. 10)

T 40. There is a story that Pythagoras sacrificed an ox on having made a new discovery in geometry; I don't believe it, however, inasmuch as he refused even to sacrifice a victim to Apollo at Delos, being loath to sprinkle the altar with blood. (*ibid.* III. 88)

T 41. Pythagoras, who believed that soul is diffused throughout the substance of the entire universe and that our individual souls are fragments of it, fails to reflect that such dismemberment of the world-soul among individuals would be a tearing of God to pieces; moreover that when our individual souls are unhappy, as happens to most of us, then the condition of God would be unhappy too. (*ibid.* I. 11)

ii. The Pythagorean Symbola

The symbolic maxims which follow are chosen from the much larger number to be found in Pythagorean literature. Each of them carries an ethical and occasionally a metaphysical meaning, which in some cases a reader can discern for himself, in others perhaps not. Traditional and probable interpretations of the more obscure symbola are offered in the Notes.

- S 1. *Step not beyond the center of the balance.*
- S 2. *Go not by the public road.*
- S 3. *Assist a man in lifting a burden, not in laying it down.*
- S 4. *Do not sit on a bushel measure.*
- S 5. *Do not tear away the crown.*
- S 6. *Do not poke the fire with a sword.*
- S 7. *Abstain from beans.*
- S 8. *Always serve salt with a meal.*
- S 9. *Do not throw stones into fountains.*

- S 10. Do not urinate in the direction of the sun.
 S 11. Do not stick iron into anyone's footprints.
 S 12. Let no swallows nest on your roof.
 S 13. Do not step over a calf's tether.
 S 14. Do not turn back in the middle of a journey.
 S 15. On rising from bed obliterate the print of your body.
 S 16. Leave no mark of the pot on the ashes.
 S 17. Keep away from the cypress chest.
 S 18. Do not wear a narrow ring.
 S 19. Do not sing without harp accompaniment.
 S 20. Wear no rings containing images of the gods.
 S 21. Pour your libations to the gods at the handle of the cup.
 S 22. Offer the gods no wine from an unpruned grapevine.
 S 23. Feed the cock and protect him, for he is sacred to the sun and moon.
 S 24. Do not obliterate the place of the torch.
 S 25. The wind is blowing; adore the wind.

iii. From the Golden Verses

1. First honor the immortal gods, as they are established and ordained by the Law.
2. Honor the Oath, with all religious devotion.
3. Next honor the heroes, full of goodness and light.
4. Honor likewise the terrestrial daemons, rendering to them the worship that is lawfully due them.
5. Honor also your father and mother, and near relatives.

6. As for the rest of mankind, make those your friends who distinguish themselves in virtue.
- 7, 8. Give ear to a [Pythagorean] comrade's lightest word; avoid being irked by his incidental faults.
12. Above all, have respect for yourself.
14. Accustom yourself not to perform actions except as governed by reason.
15. Reflect always that it is ordained by destiny that all men must die.
16. Reflect that the goods of fortune are uncertain, and that as they are acquired so they may likewise be lost.
- 31, 32. Do not neglect the health of your body: give it drink and meat in due measure, and give it such exercise as it needs.
35. Accustom yourself to a way of living that is neat and tasteful but without luxury.
36. Avoid all that will stir envy.
- 40-44. After going to bed do not allow sleep to close your eyelids until you have first examined all your actions of the day, asking yourself: *Wherein have I done amiss? What have I omitted that ought to have been done? If you find on reflection that you have done anything amiss, be severe with yourself; if you have done anything good, rejoice.*
48. Never put your hand to any undertaking until you have first prayed to the gods that you may accomplish what you are about to attempt.
- 49-50. When you have made this habit [of prayer to the gods] familiar to yourself, then you will know the constitution of the immortal gods and of men.

61, 62. *O Zeus, father of men, if you would deliver men from the evils that beset them, show them what daemon is to be invoked.*

66. *By healing your soul you will thereby deliver it from all evils, from all afflictions.*

71, 72. *When after divesting yourself of your mortal body you arrive in the pure upper aether, you will be a god, an immortal, incorruptible; and death shall have no dominion over you.*

iv. Philolaus

Philolaus is not actually a Presocratic, since he was virtually contemporary with Socrates, whom he must have outlived by at least eleven years if it is true, as Diogenes asserts, that Plato while on a journey to Italy in about 388 B.C. had a conversation with him. Nevertheless he must be included here as representing the last known stage of the development of Pythagorean thought up to the time of Plato. Moreover he was reputed to be the first Pythagorean to put the essentials of the doctrine into systematized writing.

Since he was born in southern Italy, Philolaus may have been the son of one of those Pythagoreans who escaped the massacre at Crotona. In any case he is known to have studied under Lysis, who himself had escaped; and he passed the teaching on to Simmias and Cebes, the two young men who figure so prominently in Plato's *Phaedo*. In view of the close-knit continuity of Pythagorean thought it is not possible to be sure how much Philolaus added to its teachings; but the balance of evidence indicates that he either invented or gave a fresh emphasis and interpretation to two main doctrines: (1) that the soul is an immortal *harmonia*,

and (2) that the earth is a planet revolving (like the sun and the other planets) around a central fire. He appears also to have made a number of important contributions to the development of mathematics, such as the method of constructing the five regular solids.

The Fragments that follow have traditionally been attributed to Philolaus, although in recent times a number of scholars have cast doubts on their authorship. A résumé of the main controversy may be found in Kirk and Raven, pp. 308-313. But while the authorship and exact date of the Fragments may lie open to question, their Pythagorean character is unmistakable, and for that reason they invite study in the present connection.

FRAGMENTS

1. *In the universe everything is fitted together and harmonized out of the unlimited and the limiting—both the universe as a whole and all the things that it contains. (1)*
2. *It is necessary that all things must be either limiting, or unlimited, or both limiting and unlimited. Since things cannot consist either of the limiting alone or of the unlimited alone—so, at least, it plainly appears—we must obviously conclude that the universe and its contents are fitted together and harmonized by a combination of the limiting and the unlimited. (2)*
3. *For if everything that is were unlimited, there would not be anything of such a character that it could be recognized. (3)*
4. *Whatever can be grasped by the mind must be characterized by number; for it is impossible to grasp anything by the mind or to recognize it without number. (4)*

5. *Number comprises two distinct forms, the odd and the even; there is also a third, compounded of both, the even-odd. Each of these forms takes many guises, as is shown by each different object.* (5)

6. *As for nature and harmony, the situation is as follows. The real essence of actual things is eternal, and thus nature must partake of divine rather than of merely human intelligence. For it would be impossible for us to recognize any existing thing, unless each of the things of which the universe is composed had a real essence; this holds both for what is limiting and for what is unlimited. Since these two first-principles are basically unlike, it would obviously be impossible for the universe to have been put in order unless a harmony were supplied; it is thanks to this addition that the orderly universe came-to-be.* (6, to line 6)

7. *The One is the first-principle of everything.* (8)

8. *The first element of harmony, the One, is at the center of the Sphere, and is called the hearth.* (7)

9. *Harmony involves a unity of mixed elements that are various, and an agreement of elements that disagree.* (10)

10. *In studying the operations and the essence we must take account of the power and role of the Decad: it is great, completely self-realizing, and all-accomplishing; it is the first-principle of human life, in which it participates, and of which it is the leader. Its power is such that without it all things are unlimited, obscure, and indiscernible.*

For it is in the nature of number that the possibility of recognition resides; it gives direction and teaching to every man with respect to what is unknown and baffling. Nothing about

existing things—neither they themselves nor their relations to one another—would be clear without number and the essence of number. It is Number which takes the things that we apprehend by sense-perception and fits them harmoniously into the soul, thereby making them recognizable and capable of being compared with one another, as the power of the gnomon makes possible. Thereby it gives body to things and distinguishes the different relations between things, whether unlimited or limiting. You can see the nature and power of number illustrated not only in spiritual (daemonikos) and divine matters but also [implicitly] in human affairs and in language quite generally, including productive activities in all the crafts as well as in music. (11)

11. *Falsehood does not inhere in the nature of number and harmony; for there is no kinship between it and them. Falsehood and envy partake of the nature of the unlimited, the unreasonable, and the irrational. Falsehood cannot be breathed into number, being hostile and inimical to its very nature; whereas truth is congenial to number and shares close family ties with it.* (11, ctd.)

12. *The elements of the Sphere are five: the fire in the Sphere, the water, the earth, the air, and the ship's hull in which it rests.* (12)

13. *It is an ancient teaching by theologians and inspired prophets that the soul, in being yoked to the body and buried in it as in a tomb, is suffering punishments for certain past misdeeds.* (14)

14. *The soul is established in the body through number; which is to say, through immortal and incorporeal harmony.*

(22)

15. *The body is loved by the soul, because without the body the soul cannot get sense-impressions. After the soul has been separated from the body in death, its existence in the world is incorporeal. (ibid.)*

16. *Number is the ruling and self-creating bond which maintains the everlasting stability of the things that compose the universe. (23)*

8

The Sophists

THE ADVENT OF THE SOPHISTS marks a new turning in ancient Greek philosophy. Metaphysical thought in its development from Thales to Anaxagoras on the one hand and to the Atomists on the other shows a fairly logical, almost a dramatic pattern. First there are the naive attempts to find the ultimate explanation of things in a single, perceptually recognizable kind of substance; out of them a growing interest in the "how"—in the finding of a principle by which to explain change; then the bold declaration of Heraclitus that change itself is the ultimate reality and the ultimate basis for all explanation; the equally bold counter-declaration by Parmenides that change, being intellectually unacceptable, simply "is not"; and finally the three main and diverse attempts to reconcile the manifest fact of change with the Eleatic principle that what is ultimate is necessarily changeless. Greek philosophy was soon to proceed, spurred and directed by the philosophical genius of Plato, far beyond this compact group of inquiries and solutions; but Plato's achievements of penetration and subtlety were made possible by his having brought man and the problems of human essentiality into the very heart of the metaphysical problem. Plato might be called, in a sense, a metaphysical anthropologist. What Plato might still have accomplished without the example and goad of Socrates we do not know, nor what Socrates

Women Writers of Ancient Greece and Rome

AN ANTHOLOGY

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15. Theano (lived 6th century BC; texts late 4th–3rd centuries BC and later)

Introduction

In antiquity Theano was thought to have been one of the early Pythagoreans (of the sixth century BC), and various texts were in circulation under her name. However, there is serious doubt about the authenticity of the extant texts attributed to her. Philological study has determined that they were written by at least two different hands from at least two different periods.¹ Moreover, the biographical details preserved from antiquity about Theano are confused and conflicting, suggesting later invention. The extant works attributed to her—and other Pythagoreans, male and female (including Aesara, Phintys and Perictione)—have been generally considered to be forgeries, perhaps dating from as late as the first–second centuries AD.² Consequently the collection of these works has been labelled the *Pseudoepigrapha Pythagorica*.

While Theano was remembered as an early Pythagorean, her exact relationship to Pythagoras was the subject of some speculation. She is variously described as a pupil, a daughter or the wife of Pythagoras, and the mother of his children, Telauges, Mnesarchus, Myia and Arignote (who were also Pythagoreans). She is also said to have been the wife of another Pythagorean, Brontinus of Croton (or Metapontum). She came from Metapontum, Thuria, Cressa or Croton, and her father was Leophron or Pythonax or Brontinus.³ Iamblichus adds a little more to her biography, telling us that she married Aristaeus after Pythagoras' death. Aristaeus thus succeeded Pythagoras as head of his school, educator of his children and husband of his wife.⁴

We cannot reconcile these conflicting accounts and some details must be wrong. They may be based on inferences from various pseudonymous texts published in her name. We should not discard Theano as an historical figure entirely. There may even have been two (or more) Pythagoreans named Theano, and the details of the women may have become confused. Iamblichus distinguishes the wife of Brontinus from the wife of Pythagoras (*Life of Pythagoras* 265 cf. 267, 132⁵), and Theano was not an uncommon name (there is a Theano in Homer).⁶

The attribution of both lost and extant works to Theano is another problem. Were the texts by Theano (wife of Pythagoras), Theano (wife of Brontinus), other women named Theano, anonymous authors (male or female) who attributed them to Theano to associate them with Pythagoras' famous wife, or a variety of these possibilities? In antiquity Theano was a credible historical and philosophical figure with a reputation as an ideal wife and mother. She provided an example of the application of Pythagorean philosophy in a woman's life and was therefore an attractive subject for pseudonymous writers. The ancient testimony that Theano was a student of Pythagoras and wrote philosophical works is (as most ancient biography) a later fiction—at any rate, the extant texts attributed to her are not that old.

Thesleff has demonstrated that some of Theano's apophthegms should be dated, on the basis of their dialect, to some time in the fourth/third centuries BC; the rest of this work (in

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s BC; the rest of this work (in

Attic and Attic Koine) is much later.⁷ The authenticity of the fragments and letters attributed to Theano (and other women philosophers) has nevertheless been defended by Waithe,⁸ who distinguishes the wife of Pythagoras, Theano I, from another later Theano II. She attributes fragments 1-8 to the former and fragments 9, 12 and 13 to the latter. Fragments 10, 11, 14-16, she suggests, were eponymous—each by a Theano—arguing that it is only the attribution to Theano, wife of Pythagoras (which the letters do not explicitly claim) which is spurious. However, the dialect of 1-8 makes them unlikely to have been by Pythagoras' wife. It also seems unlikely that the letters are by various women who happened to have been named Theano, for their publication (and hence preservation) was a deliberate literary act. Each author would have to take care to distinguish herself clearly from the historical Theano. There was an acceptance of pseudonymous work as a literary genre in the ancient world. Pseudonymy does not imply that the texts should not be taken as serious expressions of the application of Pythagorean philosophy in a woman's life, nor that the texts were written by men.⁹

The works attributed to Theano were: *Pythagorean Apophthegms*, *Female Advice*, *On Virtue*, *On Piety*, *On Pythagoras*, *Philosophical Commentaries* and *Letters*.¹⁰ In the extant fragment of *On Piety*, Theano argues that Pythagoras drew an analogy between numbers and objects, offering commentary on a Pythagorean doctrine interpreted differently by Aristotle (*Metaphysics* 1090 A.22). The apophthegms may have been published as a collection under her name: they consist of sayings that were thought to have been appropriate to her. Philosophical letters have been preserved in her name, and may have been published under the title of *Philosophical Commentaries* or *Female Advice*.¹¹ They treat three key concerns of a wife: the way she should bring up her children, how she should treat the servants, and how she should behave virtuously towards her husband.

In the letter to Euboule, the author is critical of luxurious treatment of children, arguing that the mother's role is to prevent children from falling into self-indulgent habits, and to foster their virtue through moderation—a typical Pythagorean sentiment.¹² In the letter to Nicostrate she discusses the correct way for a wife to behave when her husband takes up with a prostitute. She argues that the wife should win back the husband through her virtue. Criticising his behaviour and behaving dishonourably herself are shown to only further hurt her. In contrast, by setting an example of the correct behaviour, the wife distinguishes herself from the courtesan and will restore the husband's true love for her, forcing him to repent of his immoral behaviour. Her virtuous behaviour, she argues, will make him act virtuously. Harmony in the family can only be achieved by the honourable behaviour of the wife. She can provide a role model for her husband and thereby control his behaviour; thus can a woman's honour exceed that of a man. The letter to Eurydice offers an explanation for a husband's infidelity to this wife, excusing his behaviour with a superficial analogy to music; it offers a very different argument to the one used in the letter to Nicostrate, which deals with essentially the same subject.¹³ The third philosophical letter, addressed to Callisto, advises moderation in the treatment of the household servants. Here the important principle—the right measure—is shown to give the best results.

The letter to Euclides adopts a more humorous tone. Theano ironically expresses concern for the doctor who failed to come to treat a friend of hers because of his own illness. The letter to Rhodope reads more like a genuine letter, but was clearly not by the historical Theano;¹⁴ it offers evidence for the literacy of women and the sharing of books.

Theano**On Piety**

1.

I have discovered that while many Greeks think that Pythagoras said that everything is produced by number, this theory itself is problematic: how can what does not exist be thought to create? But he did not say everything comes from number, but happens according to number, because primary order is in number. By sharing in this in counting, something is assigned to be first, and second, and the rest sequentially.

Apophthegms

2.

For many writers confirm that a woman is able to give birth in the seventh month, including Theano the Pythagorean....

3.

Theano, the wife of Pythagoras, when asked how she would be held in high honour, said, 'By plying my loom and resisting my bed'.

4.

Theano, when putting on her halation, exposed her arm. A man said, 'Your arm is beautiful'. She said, 'But it is not public'.¹⁵

5.

Theano, when she was asked how many days it was after sex with a man that a woman becomes pure, said, 'With her own husband, at once, but with another man, never'.¹⁶

6.

Theano, the Pythagorean philosopher, when asked what the duty of a woman was, said 'To please her husband'.

7.

There are no writings by Telauges, but there are some by his mother Theano. And they say that when she was asked how many days it was after sex with a man that a woman becomes pure, she said, 'With her own husband, at once, but with another man, never'. And she advised a woman who was about to go to her husband to cast off her shame with her clothes, and to pick it up with her clothes when she got up again. Asked what that was, she replied, 'That which defines me as a woman'.

Philosophical Commentaries (?)

8.

Theano writes: Life would be feast to the wicked, who, after doing evil, then died; if the soul were not immortal, death would be a blessing.

Female Advice or Letters (?)9. *Letter to Euboule*

Theano to Euboule: greetings.

I hear that you are bringing up your children in luxury. The mark of a good mother is not concern for her children's enjoyment, but training towards moderation. So watch you do not do the work of an

indulgent mother rather than a loving one. When pleasure and children are brought up together, it makes them undisciplined. For what is sweeter to the young than accustomed pleasure? So, my friend, it is necessary that the raising of children is not their downfall. And luxury is the downfall of natural character whenever they become lovers of pleasure in their souls, and sweet sensations in their bodies, their souls shunning work, their bodies becoming softer.

(2) It is also necessary to exercise the children you are raising in what they fear, even if this inflicts pain and distress; so that they do not become slaves of what they experience, eager for pleasure and reluctant to face pain, but honour what is good above all, holding back from pleasure and standing up to pain. Don't let them become completely full of food nor have their every pleasure gratified, nor be undisciplined in their childhood, nor allow them to say everything and try everything, especially if you are worried if they cry and take pride if they laugh, and laugh if they strike their nurse or abuse you, and if you provide coolness in summer and warmth in winter and every luxury. Poor children sample none of these things and they are raised well enough, and do not grow any less and become stronger by far.

(3) But you nurse your children like the offspring of Sardanapalus, weakening his masculine nature with pleasure. For what would one do with a child who cries if he does not eat sooner, and if he eats seeks the delights of treats, and if he is hot wilts, and if he is cold collapses, and if someone criticises him responds by fighting, and if someone does not serve his pleasure he is upset, and if he is not chewing is unhappy, and wastes his time on mischief for the pleasure of it, and wanders around to no good purpose.

(4) Be careful, my friend, knowing that children who live with no restraint, when they grow up into men become slaves, and keep such pleasures from them. Make their food plain not sumptuous, and allow them to bear hunger and thirst, and even cold and heat, and feel ashamed among their peers or supervisors. For this is how it comes about that they are ennobled in spirit, whether they are being uplifted or downtrodden. For, my friend, labours are a hardening up process for children, during which virtue is perfected; those who have been sufficiently dipped in this process bear the bath of virtue as something which is natural to them. So look out, my friend, lest, just as vines which have been badly looked after produce little fruit, because of luxury your children produce the evil of hubris and complete worthlessness. Farewell.

10. Letter to Euclides

Theano to Euclides the doctor.

Yesterday someone had dislocated his leg and the man sent to summon you came to you (and I myself was present—for the injured man was a friend) but returned immediately in a hurry, saying that the doctor was poorly and physically unwell. And I dismissed the pain of that friend (I swear by the gods) and turned my attention to the doctor and prayed to Panacea and Apollo, the famous archer, that nothing incurable had happened to the doctor. Although I am despondent I write this letter to you, dearly wanting to learn how you are, lest your gastric orifice is bad, your liver has been weakened by fever, or some organic harm has come upon you. So with no thought for the many limbs of my friends, I welcome your own dear health, my good doctor.

11. Letter to Eurydice

Theano to the wonderful Eurydice.

What grief is hanging on to your soul? You are upset by nothing other than that the man with whom you live has gone to a prostitute and takes his physical pleasure with her. But you should not be like this, you paragon among women. Do you not see that when the hearing has become sated with

pleasure from an instrument, it is filled with musical song, but when it has become sated with this, loves again the flute and enjoys listening to the reed-pipe? And what sort of fellowship is there between the flute, musical song and the wonderful echo of the instrument made most sweet for music? It is just the same for the prostitute with whom your husband is living as it is for you. For your husband thinks of you in his habits and nature and thought, but whenever he has too much, he will go and live with the prostitute for the time being. There is a certain love of foods which are not good in those in whom a corrupting humour lies.

12. *Letter to Callisto*

Theano to Callisto.

Authority to rule the household is granted by the law to you younger women as soon as you are married, but instruction is needed in everything about household management from older women, who always offer advice. For it is good to learn in advance what you do not know, and to consider the advice of older women as best. For in these matters a young soul must be raised from its girlhood. And the primary area of authority in the house for women is over the servants. And, my friend, the most important thing is good will on the part of the slaves. For this is not purchased as a possession along with their bodies, but intelligent mistresses create it in the fullness of time.

(2) Just use is responsible for this, ensuring that they are neither exhausted by work nor made unable to work through lack of food. For they are human by nature. Some women think profitable what is the most unprofitable, treating their servants badly, weighing them down with work, while taking away what they need. Then after making a profit of an obol, they pay the cost of enormous damages: hatred and the most evil plots. In your case, provide an amount of food in proportion to the amount of wool-working done in the day.

(3) This will do for their diet, but for disorderly behaviour, what must serve is what is right for you, not what is advantageous for them. For it is necessary to value your servants at what they are worth. While cruelty will not bring any grace to your soul, reasoning provides control no less than hatred of evil. If there is an excess of vice in the servants which cannot be overcome, they must be sent to market to be sold. Let what is foreign to the needs be estranged from the mistress too. Let your judgement of this be proper. Thus you will balance the truth of the wrongdoing with the justice of the condemnation, and the magnitude of the wrongdoing with the appropriate magnitude of the penalty.

(4) A mistress' forgiveness and grace towards those who have done wrong will release them from the penalty, and in this way too you will maintain a proper and appropriate way of life. For some women, my friend, through cruelty even whip the bodies of their servants, dehumanised through jealousy or anger, as if they are inscribing a memorial with the excess of their bitterness. Some slaves in time are tired out by work and can do no more; others make their way to safety by running away; and some cease living, making the transition to death with their own hands, and in the end, the isolation of the mistress, who weeps for her own lack of good counsel, provides an empty change of heart.

(5) But, my friend, imitate musical instruments and think over what sounds they make when they are loosened too much, and how they break when they are over-tightened. For it is just the same with your servants. Excessive slackness creates dissonance in respect for authority, but a tightening always causes a natural break. You must think on this: the right amount is best in everything.
Farewell.

13. *Letter to Nicostrate*

Theano to Nicostrate: greetings.

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I heard about the madness of your husband—that he has a prostitute, and that you are jealous of him. I, my friend, have known many men with the same disease. For they are hunted out by these women, it seems, caught and loose their minds. But you are upset by night and by day, and troubled and plot something against him. My friend, do not do it. For the virtue of a wife is not in watching over her husband, but bearing things in common with him. And bearing things in common with him is to bear his madness. If he mixes with a prostitute for his pleasure, he does so with his wife for his advantage. It is an advantage not to mix evils with evils, nor to add madness to madness.

(2) Some errors, my friend, are made worse when they are condemned, but cease when kept silent—as they say, fire puts itself out when left in peace. In addition, although you seem to want to escape notice, if you condemn him you lift the veil from your own feelings. And clearly you will be making a mistake. You believe the love of your husband is the behaviour of a gentleman. For this is the grace of fellowship. So believe that when he goes to the prostitute he is insincere, but he stays with you to live a shared life, and he loves you in thoughtful reflection, but her in passion.

(3) The moment of time for this madness is short. For it exists at the same time as its satisfaction, and begins and ceases very quickly. For a man who is not thoroughly bad, the time with a prostitute is very brief. For what is more empty than desire that enjoys what is wrong? So he will eventually realise that he is diminishing his own life and slandering his own good reputation—no one keeps up a self-induced injury when he reflects on it. So, summoned to you by what is just, and seeing the diminution of his own life, he will notice you, and soon repent, unable to bear the shame of his condemnation.

(4) But, my friend, live, not responding to prostitutes but remaining aloof from them by your proper conduct towards your husband, by your care for the house, by your compassion for those who work for you, and by your deep love for your children. There is no need for you to be envious of that woman (although it is a fine thing to envy virtuous women), but you should prepare yourself for reconciliation. For a fine character brings high regard even from enemies, my friend, and honour is the outcome of a true nobility. Through this it is possible for a woman's authority to exceed a man's, and for her to be honoured even more, rather than serve her enemy.

(5) So he will be more ashamed if he has been fostered by you, and he will be willing to reconcile more quickly. He will love you deeply, as you will be easier to sympathise with, when he has recognised the wrongs he has committed against you, noticing your care for his livelihood and testing your love for him. And just as physical sufferings make their cessation sweeter, so disagreements between friends make their reconciliation more significant.

(6) In addition, avoid plans that arise from your suffering. For he has a disease and urges you to catch this painful disease too. In harming his own good name he urges you to harm your appropriate behaviour, and in destroying his own life he urges you to destroy what is beneficial for you. By this you will seem to have set yourself against him and in punishing him you punish yourself. And if you separate from him and leave, you will change your former husband only to find another, and if he errs in the same way, yet another (for not having one is not bearable for young women), or you will stay alone without a husband like a spinster.

(7) Or will you neglect the house and destroy your husband? Then you will live with the harm of a painful life. Or will you seek to fight back against the prostitute? She will be on her guard and will get around you, and if she fights back against you, a woman who does not blush is a champion in battle. But is it good day after day to fight against your husband? And what more? For while the fights and reproaches will not stop his licentiousness, as they increase they will increase the

disagreements. What then are you planning against him? Do not do it, my friend. Tragic drama taught us to defeat envy, in the meaning of the outcome of Medea's unlawful actions. But just as your hands must not touch your infected eyes, so too you must separate your actions from your suffering. By steadfastly enduring it, you will sooner quench your suffering.

14. *Letter to Rhodope*

Theano to Rhodope the philosopher.

Are you upset? I am upset myself too. Are you sad because I have not yet sent you Plato's book, the one called *Ideas or Parmenides*? But I am most deeply aggrieved myself too, because no one has yet met with me to discuss Cleon. I will not send you the book until someone comes here and clarifies the issues concerning this man. For I love his soul too much, because it is the soul of a philosopher: one keen to do good, one who fears the gods beneath the earth. And do not think that the story is other than what has been said. For I am half-mortal and can not bear to look upon this star which lights the day.

15. *Letter to Timareta* (in Pollux)

... 'the master-of-the-house' and 'the mistress-of-the-house' ... I found both of these words in a letter of Theano, the wife of Pythagoras, written to Timareta.

16. *Letter to Timonides*

Theano to Timonides.

What fellowship is there for you and me? Why do you always slander us? Or do you not know that we praise you before everyone, even if you do the opposite? But, again, understand that even if we do praise there is no one who believes, and even if you do slander, there is no one who listens. And I am happy because of this: a god sees it like this and the truth especially judges it so.

Notes

1. H. Thesleff, 'An introduction to the Pythagorean writings of the Hellenistic Period', *Acta Academiae Aboensis, Humaniora* 24.3 (Abo: To akademi, 1961).
2. As E. Zeller, *Philosophie der Griechen*, III.2 (Leipzig: D.R. Reiland, 1903), 97-126.
3. Iamblichus, *Life of Pythagoras* 267, 132; *Suda* s.v. Theano 1, Theano 2, Pythagoras; Diog. L. 8.42; Porphyry, *Life of Pythagoras* 4, 19; Anonymous in Photius 438b.31; Hermesianax in Athen. 13.599a; Schol. in Plato, *Republic* 600b: sources (in Greek) collected by H. Thesleff, 'Pythagorean texts of the Hellenistic Period', *Acta Academiae Aboensis, Humaniora* A, 30.1 (Abo: To akademi, 1965), 193-4.
4. *Life of Pythagoras* 265.
5. At *Life of Pythagoras* 132, Brontinus' wife is called Deino (with Scaliger's emendation of the text, which is corrupt); Theano is a better reading.
6. B. Nagy, 'The naming of Athenian girls', *Classical Journal* 74 (1979), 360-64.
7. Thesleff, 'An Introduction to the Pythagorean Writings', 113-5.
8. M.E. Waiche, *A History of Women Philosophers*, I (Dordrecht: M. Nijhoff, 1987), 12-15, 41-55.
9. The collection of letters published by R. Hercher, *Epistolographi Graeci* (Paris: A. Firmin Didot, 1873; Amsterdam 1965), is testimony to this literary genre.
10. Thesleff, 'Pythagorean texts of the Hellenistic Period', 193-95; there are two vague references to poems attributed to her: Didymus in Clement of Alexandria (*Stromata* 1.80.4), and *Suda* (s.v. Theano 2); Thesleff, 'An introduction to the Pythagorean writings', 22-23.

16. Perictione (texts date late 4th–3rd centuries BC, and 3rd–2nd centuries BC)

Introduction

Two works attributed to Perictione have survived in fragments: *On the Harmony of Women* and *On Wisdom*. Differences in language suggest that they were written by two different people. Allen and Waithe identify them as Perictione I and Perictione II.¹ Plato's mother was named Perictione, and Waithe argues that she should be identified as the earlier Perictione, suggesting that similarities between Plato's *Republic* and *On the Harmony of Women* may not be the result of Perictione reading Plato, but the opposite—the son learning philosophy from his mother.² *On the Harmony of Women*, however, is written in Ionic prose with occasional Doric forms. This mixed dialect dates the work to the late fourth or third centuries BC.³ The reference in *On the Harmony of Women* to women ruling suggests the Hellenistic monarchies of the third century BC or later. *On Wisdom* is written in Doric and is partly identical with a work by Archytas of the same name. This work should be dated later, to the third or second centuries BC.⁴ Both the dates of the works and their dialects mean Perictione the mother of Plato could not have written them.

We have then two Pythagorean texts, attributed to otherwise unknown women named Perictione who should be dated perhaps one hundred years apart. The texts themselves are very different in content. *On the Harmony of Women* is directed to women, and reiterates the important Pythagorean principal of moderation. It discusses the duty of a woman to her husband and marriage,⁵ and to her parents, providing a practical expression of Pythagoreanism. The link she makes between chastity and proper dress, criticising women for dressing up, has a long history.⁶ As Perictione describes the luxury clothes, cosmetics and jewellery that women should not wear, we gain an impression of what was fashionable at the time. *On Wisdom* is more theoretical. It offers a philosophical definition of wisdom, and is not directed towards women.

Perictione I

On the Harmony of Women

1.

It is necessary to consider the harmonious woman full of intelligence and moderation. For it is necessary for a soul to be extremely perceptive regarding virtue to be just and brave and intelligent and well decorated with self-sufficiency and hating baseless opinion. For from this there comes great benefit for a woman, for herself as well as her husband and children and her house, often too for her city, if such a woman rules cities and peoples, as we see in kingdoms. So when she rules over her desires and passions, she becomes righteous and harmonious, so unlawful lusts will not pursue her, but she will keep hold of her love for her husband and children and entire house. For all women who end up lovers of other men's beds become enemies of everyone in the house, both free and servant. She fabricates lies and deceptions for her husband, and invents false stories about everything for him, so she alone may seem to provide good will and rule the house although she loves laziness. From this

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there comes disaster for everyone, and it falls upon her as well as her husband. This is enough said about this.

But one must also lead the body to natural amounts of food and clothing and washing and anointing and hairstyles and jewellery made of gold and stones. For all women who eat and drink and dress in everything expensive and wear the things women wear, they are ready for the error of every sin, both of the bed and of the other types of criminal activity. The only necessity is to satisfy hunger and thirst, even if this is done meagrely, and the cold, even if this is done with a goat-skin or rags. It is a great sin to wear clothing from far away and purchased at great cost or from eminent people. It is a great foolishness to wear cloaks excessively and elaborately dyed by sea-baths of shellfish or some other expensive colour. For the body wants neither to shiver nor to be naked (for the sake of decency), and needs nothing else. But human opinion, with its ignorance, rushes into what is empty and excessive. So she will not wear gold nor Indian stone nor any from elsewhere, nor will she plait her hair with great skills, nor anoint herself with Arabian perfumes, nor will she paint her face, whitening or rouging it, nor blacken her eyebrows and eyelashes and treating her grey hair with dyes, nor will she bathe too often. For a woman who seeks these things seeks an admirer of feminine weakness. For beauty from intelligence, and not from these things, pleases women who are well-born. She should not believe that noble birth and wealth and coming from a great city are all that is necessary, nor reputation and the friendship of eminent and royal men. If this is the case, it does no harm, but if not, longing for it does not create it. For thinking about things other than these does not keep a woman from living her life. And even if these things have been allotted to her, do not let her soul chase after great and wonderful things, but let it walk away from them. For they drag her into misfortune and harm rather than help her. With them lie plotting and hatred and torture, so a woman of this kind would not be untroubled.

It is also necessary to revere the gods, confident in happiness, obeying ancestral laws and customs. After them I say honour and revere your ancestors. For they exist and for their offspring act upon everything equally with the gods. With respect to her husband, it is necessary for a woman to live lawfully and honourably, not thinking of her private concerns, but keeping and guarding her marriage. For everything depends on this. She must put up with everything from her husband, even if he is unlucky, if he errs through ignorance or sickness or drunkenness, or lives with other women. For while this error is forgiven in men, it is never forgiven in women, and revenge is taken. So while a wife must keep the law and not be jealous, nor bear any anger, meanness, criticism, jealousy, badness or anything else that is a part of his character. She should be prudent and arrange everything just as he likes it. For when a woman is dear to her husband and acts honourably towards him, harmony rules and loves the whole house and makes outsiders well disposed towards the house. But when a woman is not dear to her husband, she does not want to see her house safe, nor her children, nor the servants, nor any of the property, but she calls and prays for complete ruin, as if she were an enemy, and prays for her husband to die as if he were an enemy, so that she may mix with other men, and she hates whoever pleases him.

I think this is how a woman is harmonious: if she is full of intelligence and prudence. For she will benefit not just her husband, but also her children and relatives and slaves and her whole house, and the possessions in it, and friends from her city and foreign friends. And she will keep their house without over-elaborate skill, speaking and hearing good things, and following her husband in the unity of their shared life, serving the friends and relatives whom he praises, and considering sweet and bitter the same things as her husband, so that she is not out of harmony with the whole.

2.

You must not speak ill of your parents nor do them any ill, but obey them in important and minor matters. And in everything that happens to the body and soul both from without and from within, and in war and peace, in sickness and in health, in poverty and wealth, in bad and good repute, in private and public affairs, you must stay with them and never run away, and obey them even in madness. For those of due reverence, this is appropriate and honourable. But if someone should

despise her parents, planning an evil of some sort, she is charged with a sin by the gods, whether she is alive or dead, and she is hated by people, and through her evils she finds a place beneath the earth with the irreverent, in their domain for eternity, put there by the hands of justice and the gods of the underworld, who are appointed as overseers of these acts.

For the sight of your parents is beautiful and divine, and the honouring and care of them too, more so even than the sight of the sun and all the stars, which the heavens wear and revolve, and anything else which someone might think greater through observation. But I think that the gods are not unhappy when they see this happen. And so one must revere parents, whether they are alive or departed and never speak against them, but even if they act irrationally through illness or mistake one must urge them and teach them, and in no way hate them. For there could not be any greater sin and injustice for humans than irreverence of one's parents.

Perictione II

On Wisdom

1.

Mankind has come into being and exists to contemplate the theory of the nature of the whole. To possess this very thing is the function of wisdom, and to contemplate the purpose of existence.

2.

So geometry and arithmetic and other theoretical things and sciences study what exists, but wisdom is concerned with every type of thing that exists. For thus wisdom is concerned with everything that exists, as sight is concerned with everything that can be seen, and hearing with everything that can be heard. But with respect to what has occurred to attributes of all things, some things have happened to everything, some to most things, and some to each thing individually. So while what has happened to everything is in the provenance of wisdom to see and to contemplate, what has happened to most things is in the provenance of science, and what has happened to each thing individually is in the provenance of sciences for each separate thing. And because of this wisdom discovers the principles of all things that exist, natural science for the principles of things that occur in nature, geometry and arithmetic, and music for the principles of quantity and harmony.

So whoever is able to analyse every type of thing by one and the same principle, and in turn from this principle to synthesise and enumerate, this person seems to be wisest and truest, and moreover, to have discovered a beautiful look-out from which he will be able to look out upon god and everything separated from him and arranged in rank and file.

Notes

1. M.E. Waite, *A History of Women Philosophers*, I (Dodrecht; M. Nijhoff, 1987), 32.
2. Ibid, 86-71.
3. H. Thesleff, 'An introduction to the Pythagorean writings of the Hellenistic Period', *Acta Academiae Aboensis, Humaniora* 24.3 (Abo: To akademi, 1961), 17, 113-15.
4. Ibid, 17, 113-15.
5. On this see also Theano 11 (*Letter to Eurydice*) and 13 (*Letter to Nicostrate*).
6. See also the Pythagoreans Melissa, and Phintys; for the tradition of criticising women for using cosmetics see the discussion on Cleopatra, and see Xenophon (*Economics* 10.5-13) and Juvenal, (*Satires* 6.457-73, 486-510).

17. Myia centu

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17. Myia (lived c. 500 BC: text written 3rd century BC)

Introduction

Myia was remembered as one of the daughters of Theano and Pythagoras. She married Milo of Croton, a famous athlete who was also a Pythagorean.¹ As a girl she was a choir leader, as a wife she was noted for her exemplary religious behaviour (Iamblichus, *Life* 30; Timaeus in Porphyry, *Life* 4). Writings attributed to her (and Pythagoras' other children Telauges and Arignote)² were extant in Porphyry's day,³ and one philosophical treatise in her name survives today.

This treatise, in the form of a letter, cannot be by Pythagoras' daughter. The dialect dates it to the third or second centuries BC, and Pythagoras lived in the sixth century BC. The earliest reference we have to her comes in a fragment of Timaeus written in the first quarter of the third century BC⁴ (shortly before this letter was composed) and it is possible that his representation (or even invention) of Pythagoras' daughter as an ideal Pythagorean woman led to the creation of pseudonymous work in her name.

While we should not believe that Myia's letter to Phyllis is by the daughter of Pythagoras it may well have been written by a woman.⁵ It was composed during the renaissance of Pythagorean philosophy around the third century BC, possibly to serve as a philosophical textbook for practical use.⁶ It has been suggested that the work was not written by a woman.⁷ While men did write on breastfeeding and childcare,⁸ the subject matter makes a female author likely; in any event, for the advice to be taken seriously as coming from a woman, it had to be believable that a woman could have written it. The letter is addressed to a new mother named Phyllis and offers woman-to-woman advice on the treatment of her baby. It is sensible, advocating moderation and balance in all things—key Pythagorean concepts. The treatise ends with reference to further work on childcare, and it may have been part of a series of short articles on this topic, designed to introduce Pythagorean philosophy into daily life. Advice on childcare was also attributed to Theano.⁹

Myia

Letter to Phyllis

Myia to Phyllis: Greetings.

I am giving you this advice on children, as you have become a mother. Choose a nurse who is most friendly and clean, and moreover modest and not disposed to sleep nor drunkenness. For a woman of this kind would best judge how to raise free-born children, if she has nutritious milk and is not easily won over to her husband's bed. For the nurse has an important role in raising the child well, laying the foundations for its whole life. For at the appropriate time she will do everything well. She should offer the nipple, the breast and nourishment not on the spur of the moment but after some forethought, for thus she will put the baby into good health. She should not give in whenever she wants to sleep, but when the newborn wants a rest. She will provide no small help to the child. Let

the nurse not be prone to anger, not talkative nor indifferent in the taking of food, but organised and sensible and, when it is not impossible, not foreign but Greek. It is best, if the newborn is put to sleep suitably filled with milk. For in this way rest is sweet to the young and such nourishment is most easily digested. It is necessary to give simple food, if any other is given. Refrain from wine completely, as it is too strong, or add it sparingly in a mixture to the evening milk. Do not bath the child continually; for using baths rarely and at a moderate temperature is best. Moreover, the air should have a suitable balance of warmth and coldness, and the house should be neither too drafty nor too shut up. In addition the water should be neither hard nor soft, and the bedding should not be rough, but well designed for touching the skin. In all these things nature desires what is appropriate, not what is extravagant.

It seems useful to write these things to you for the present, my hopes stemming from nursing according to guidelines. With the assistance of god, I will provide appropriate and suitable reminders about the child's upbringing at another time.

Notes

1. Clement of Alexandria, *Stromata* 4.19; *Suda* s.v. Myia and Theano; Iamblichus, *Life of Pythagoras* 30, 36; Porphyry, *Life of Pythagoras* 4.
2. See Aesara for the tradition that she was another daughter of Pythagoras.
3. The late third-early fourth centuries AD, *Life* 4.
4. Porphyry, *Life* 4.
5. Contrast M.E. Waite, *A History of Women Philosophers*, I (Dodrecht: M. Nijhoff, 1987), 15.
6. H. Thesleff, 'An introduction to the Pythagorean writings of the Hellenistic Period', *Acta Academiae Aboensis, Humaniora* 24.3 (Abo: To akademi, 1961), 72.
7. As M.R. Lefkowitz, and M.B. Fant, *Women's Life in Greece and Rome: A Source Book in Translation* (2nd edn; Baltimore: John Hopkins University Press, 1992), 163.
8. E.g. Favorinus in Aulus Gellius, *The Attic Nights* 12.1; Soranus, *Gynaecology* 2.18-20.
9. See Theano 9: Letter to Euboule.

18. A

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Iamblichus, *Life of Pythagoras*

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(Nijhoff, 1987), 15.
Hellenistic Period', *Acta*

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18. Aesara (fl. 3rd century BC)

Introduction

Aesara of Lucania is a shadowy figure. She is only known to us from Stobaeus, who names her as the author of a philosophical work *On Human Nature*, some of which he quotes (1.49.27). Thesleff casts some doubt on the name of the author of this fragment, arguing that 'Aesara' is an emendation of a Doric 'Aresa' based on a tradition that Pythagoras and Theano had a daughter so named, and he follows Heeren in correcting the text.¹ With a further emendation Thesleff attributes the work to Aresas, a male writer from Lucania, known to us from Iamblichus' *Life of Pythagoras* 266. However, it is unnecessary to emend the text: there is only very weak textual support for a tradition that Pythagoras had a daughter named Aesara.² The Doric prose of Aesara can be dated to the third century BC.³

There is some debate about whether any of the Pythagorean texts attributed to women were by women. We should not assume that a text like this was not by a woman. It must at least have been credible to the intended readers that it was written by a woman: hence it provides us with evidence for female scholarship in the Pythagorean community.⁴ Aesara's work *On Human Nature* argues that contemplation of our own nature, particularly the nature of the human soul, reveals the philosophic basis for human law and morality. Aesara divides the soul into three component parts; the mind, the spirit, and desire. All three need to work together in appropriate balance for each specific task. There are thus rational, mathematical and functional principles at work in the soul, with god providing a divine principle to order the whole.⁵ Like Perictione *On Wisdom* and unlike the extant philosophical tracts attributed to other Pythagorean women, Aesara's treatise is neither directed to nor exclusively about women.⁶

Aesara

On Human Nature

I think human nature provides a common standard of law and justice for both the family and the city. Whoever follows the paths within him and searches will discover; for within him is law and justice, which is the proper arrangement of the soul. For as it is naturally threefold in form, it is formed for three functions: the mind performs judgement and thought, the spirit courage and strength, and desire love and friendliness. Each of these is so drawn up that the best part leads them, the worse part is ruled and the part in between takes the middle ground and both rules and is ruled. God brought about these things in this way through reflection on both the outline and completion of the human home, because he planned humankind alone to become the recipient of law and justice, and none of the other mortal animals. Nor could a composite whole of fellowship arise from one thing nor from many that are alike (for it is necessary since things are different, the parts of our souls are also different, as the organs of sight and hearing and taste and smell are for the body; for all these do not have the same connection with everything), nor from many dissimilar things coming together by chance, but things made for the fulfilment and arrangement and connection of the whole composition. Not only is the body made complete from many dissimilar things, but also these are not

arranged by chance nor at random, but with some law and sensible understanding. For if they carried an equal share of power and honour, though they are unlike and some worse, some better and some in between, the fellowship throughout the soul of the parts could not have been constructed. If they had an unequal share, and the worse rather than the best carried the greater share, there would be much thoughtlessness and disorder in the soul. But if the better had the greater share, and the worse the lesser, but each one not according to some rationale, there could not be unity and friendship and justice in the soul; since when each one has been drawn up with a balanced rationale, this is the sort of thing I call the most just.

And indeed, a certain unity and unanimity accompanies such an arrangement. Such a thing would justly be called good order of the soul, which would add to the strength of virtue, from the better part ruling and the worse being ruled. And friendship and love and friendliness, both within the same tribe and the same family, will sprout from these parts. For the examining mind persuades, desire loves and spirit is filled with strength, boiling with hate it becomes friendly to desire. For the mind combines the sweet with the painful, mixing up the intense and the excessive with the light and relaxed part of the soul. And each part is distributed with respect to the consideration of the tribe and family of each thing: the mind examining and tracking things, the spirit adding eagerness and strength to the examination, and desire being a relation of affection, changes the mind, making the sweet its own and adding thoughtfulness to the thoughtful part of the soul. Because of these things, I think that life for humans is best whenever the sweet is mixed with the earnest, and pleasure with virtue. The mind is able to attach these things to itself, becoming lovely through education and virtue.

Notes

1. H. Thesleff, 'Pythagorean texts of the Hellenistic Period', *Acta Academiae Aboensis, Humaniora A*, 30.1 (Abo: To akademi, 1965), 48-50.
2. Evidence for such a 'tradition' exists only in an emendation: Photius (438b) cites an anonymous biography that names Pythagoras' daughters as Myia and Sara. 'Sara' has been variously emended to both Aesara and Arignote: *ibid*, 237. See work attributed to Myia, and to Pythagoras' wife Theano.
3. H. Thesleff, 'An introduction to the Pythagorean writings of the Hellenistic Period', *Acta Academiae Aboensis, Humaniora* 24.3 (Abo: To akademi, 1961), 113-15.
4. For prejudice against female philosophers, see Phintys, *On the Chastity of Women* 1, cf. Cicero, *Nature of the Gods* 1.93.
5. For a more detailed commentary on Aesara, see M.E. Waither, *A History of Women Philosophers*, I (Dordrecht: M. Nijhoff, 1987), 19-26.
6. For other Pythagorean writers in this collection, see Melissa, Myia, Perictione, Phintys and Theano.

19. Melis

Introduction

Melissa is known from a letter to a friend and is preserved in Greek and dated to the 2nd century AD.

Melissa's text is a letter to a friend, written pseudonymously by a woman. Such sentiments are similar to those of other women writers of the period.

Melissa

Letter to Clea

You seem to me in need of sensible women but not by using extravagant and expensive and purple, for the woman is pleasing comely for a free woman a blush on your face moderation instead of extravagance in dress when she accomplishes a woman, for which dowry a discipline than that of her acquaintance right up to her de-

Notes

1. R. Hercher, *Fragmenta Hellenistica*, 1.10.
2. H. Thesleff, *Acta Academiae Aboensis, Humaniora A*, 30.1.

19. Melissa (fl. 3rd century BC)

Introduction

Melissa is known from the one extant work attributed to her—a philosophical treatise in the form of a letter to another woman, named Cleareta. The treatise is on the conduct of women and is preserved in a manuscript now in Paris.¹ The Pythagorean text is written in Doric Greek and dated by the dialect to about the third century BC.²

Melissa's text is on the qualities of a virtuous woman, and treats the way in which she should dress and her duties towards her husband. In particular it stresses that she should carry out her husband's wishes. This has led to a suspicion that the treatise was written pseudonymously by a man intent on providing an example of female behaviour in a woman's voice. Such sentiments were not new: in the fifth century BC Xenophon advises women to behave in a similar modest and dutiful fashion (*Economics* 7–10). Pythagorean texts discussing a woman's virtue and her duty to her husband were also written by (or at least attributed to) other women writers: Phintys, Perictione and Theano.

Melissa

Letter to Cleareta

You seem to me inherently full of virtues. For your enthusiastic desire to hear about good conduct for women provides the virtuous hope that you are going to become old and grey virtuously. So a free and sensible woman must be attached to a man according to the law, and beautify her face moderately, but not by using excessive skill, and she should be clad in white, neat and simple clothes, not extravagant and expensive ones. She must avoid clothes that are translucent and decorated with gold and purple, for they are used by courtesans for hunting the greater number of men, while when a woman is pleasing to her one man, her way of life is her adornment, and not her dresses. For it is comely for a free woman to be seen by her husband, but not by her neighbours. And you should have a blush on your face as a sign of a sense of honour instead of rouge, and respectability and decency and moderation instead of gold and emeralds. For a woman who desires moderation must not love extravagance in clothes, but the economy of her household. And this woman delights her husband when she accomplishes this wish. For the wishes of a man should be the unwritten law for a moderate woman, for which she should live her life. And she should believe that she brought with her as her dowry a discipline of the very best kind. She should trust the beauty and richness of her soul rather than that of her appearance and wealth; for envy and illness remove the latter, but the former extend right up to her death.

Notes

1. R. Hercher, *Epistolographi Graeci* (Paris: A. Firmin Didot, 1873; Amsterdam, 1965).
2. H. Thesleff, 'An introduction to the Pythagorean writings of the Hellenistic Period', *Acta Academiae Aboensis, Humaniora* 24.3 (Abo: To akademi, 1961), 113–15.

20. Phintys (3rd century BC)

Introduction

Scholars disagree widely on the historicity of Phintys, and the authenticity of the extant work in her name: two extracts from a treatise on the correct behaviour of women. Waithe accepts she was a fifth century Spartan and that her work is authentic, whereas Lefkowitz and Fant doubt whether her work is original or was even written by a woman.¹ Her Doric dialect could date her work to the fourth century BC; odd archaisms in the text, however, suggest a deliberate attempt to compose a work that would appear earlier than it really was, and a third century date is more likely.² Stobaeus (4.23.11) accepts that she was real, and tells us that Phintys was the daughter of Callicrates, who is otherwise unknown. Thesleff suggests that we read 'Callicratidas' for Stobaeus' 'Callicrates'. This emendation gives her father the name of a famous Spartan admiral who died in the battle of Arginusae in 406 BC.³ Phintys would thereby become a Spartan born towards the end of the fifth century BC, and writing in the fourth century BC. This identification and dating of Phintys, based as it is on a revision of the text and a near-coincidence of names, is fanciful. Iamblichus provides a possible reference to Phintys. He lists a 'Philtys' in his catalogue of female Pythagoreans (*Life of Pythagoras* 267), noting that she came from Croton. Philtys is a possible Doric form of Phintys. While Croton is a more likely birthplace for a Pythagorean like Phintys, Iamblichus states that Philtys was the daughter of Theophrisus, further distinguishing her from Stobaeus' Phintys. We should accept that the little existing information records there were two similarly named Pythagorean philosophers, Phintys (daughter of Callicrates) and Philtys (daughter of Theophrisus). Phintys was most probably a member of the Pythagorean community who lived in Italy in the third and second centuries BC.

Phintys expounds on the differences between men and women, focusing on a woman's particular virtue: chastity. This places her philosophy squarely within the bounds of contemporary morality. She offers a defence of chastity, and explains why it is necessary. Her view that a woman's greatest honour is to bear children resembling their father is well attested elsewhere, and offers a counterpoise to Nossis (poem 8) who points out that it is good for girls to resemble their mothers. Her advice on moderation, particularly with respect to a woman's dress and appearance, is also well attested.⁴ Phintys follows a traditional argument on women's chastity and the division of activities between the sexes, with women taking a domestic role, but she defends the appropriateness of a woman engaging in philosophy. She argues that, unlike some other activities, philosophy is not just for men, and can be shared by both sexes.

Phintys

On the Chastity of Women

1.

On the whole a woman must be good and orderly; and one could not become such a woman as this without virtue. For each virtue is appropriate to a different thing and improves what is receptive to it:

20. Phintys

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virtue of the eyes the eyes, the virtue of the hearing the hearing, the virtue of a horse the horse, and the virtue of a man a man. Thus too the virtue appropriate to a woman improves a woman. And a woman's greatest virtue is chastity. For because of this virtue she is able to love and honour her own husband.

While many people perhaps think that it is not appropriate for a woman to philosophise, just as it is not appropriate for her to ride horses nor to speak in public, I think that some activities are peculiar to men, some to women, and that some are common to women and men, some are more appropriate for men than women, and some are more appropriate for women than men. And while generalship and political activity and public speaking are peculiar to men, keeping house, staying indoors, receiving and looking after her husband are activities peculiar to women. But I say that courage and justice and intelligence are common to both. For virtues of the body are suitable for both a man and woman, as are similarly those of the soul. And for both men and women it is as beneficial for the soul to be healthy as it is for body. The virtues of the body are health, strength, good perception and beauty. Some of these are more natural for a man to have and foster, and some are more natural for a woman. For while courage and intelligence are more for a man because of the constitution of his body and strength of his soul, chastity is for a woman.

Because of this it is necessary for a woman, while she is being educated, to learn about chastity: from what kinds and numbers of things this good comes to a woman. And in fact I say it comes from five things: first from her piety and reverence of her marriage bed; secondly from the orderliness of her body; thirdly from the occasions when she goes out from her own house; fourthly from her not participating in secret and Cybeline rituals; fifthly in her being devout and fair in her sacrificing to the divine. But of these, the most important cause of chastity, and its most important preserver, is incorruptibility with respect to the marriage bed and not mixing with men outside the family. For firstly, a woman who breaks this law wrongs the gods of her family, and provides her family and race with bastards, not legitimate offspring. She wrongs the gods of nature, with respect to whom she swore, along with her ancestors and family, to share in a common life and produce children according to the law. And moreover she wrongs her fatherland if she does not abide by the laws which have been established. Then, she sins beyond those things for which the greatest penalty, death, is laid down, because of the magnitude of her crime: sin and hubris for the sake of pleasure is outside natural law and most unforgivable. The outcome of all hubris is destruction.

2.

She must consider this too, that she will find no purification from this sin so that she can approach the shrines and altars of the gods as a chaste woman loved by the gods. For with this crime particularly the divine is unforgiving. The most beautiful adornment of a free-woman and her greatest honour is to testify to her chastity towards her husband through her children, if they bear the stamp of likeness to the father whose seed produced them. This is my view on the marriage bed.

This is my view on adornment of her body. She must be dressed in white, simply, and without anything fancy. She will be like this if she does not wear clothes that are transparent or embroidered or silk, but moderate and white. For thus she will avoid being too well dressed and luxurious and ostentatious, and arousing unpleasant envy in other women. She should on no account wear gold or emeralds, for it would be an extravagant and arrogant gesture with respect to the local women. For a well governed city, the whole city arranged for benefit of the whole city, must be sympathetic and in agreement, and the craftsmen who make such jewellery must be excluded from the city. She should not embellish her appearance with imported and foreign colour, but by the natural colour of her body, by washing with water, and adorn herself instead with modesty. She will also bring honour to herself and to the man with whom she shares her life.

Women of high status must leave the house to make sacrifices to the founding god of the city on behalf of themselves, their husbands, and their whole households. They do not leave the house when it

is dark, nor in the evening, for some festival or to buy something for the house, but when the market is running and it is light, accompanied decorously by one female servant or at the most two.

She should offer prayers of sacrifice to the gods, as is within her power, but refrain from secret and Cybeline rituals at home. For the city's common law prevents women from celebrating these rites, because, amongst other reasons, these forms of ritual lead to drunkenness and ecstasy. The mistress of the house must be chaste and untouched with respect to everything, even when supervising at home.

Notes

1. M.E. Waite, *A History of Women Philosophers*, I (Dordrecht: M. Nijhoff, 1987), 26; M.R. Lefkowitz and M.B. Fant, *Women's Life in Greece and Rome: A Source Book in Translation* (2nd edn; Baltimore: John Hopkins University Press, 1992), 163.
2. H. Thesleff, 'An introduction to the Pythagorean writings of the Hellenistic Period', *Acta Academiae Aboensis, Humaniora* 24.3 (Abo: To akademi, 1961), 113-15.
3. Xenophon, *Hellenica* 1.6.1-34; Diodorus 13.76-9, 97-100.
4. See for example Melissa, Perictione I and Cleopatra; for the tradition of criticising women for using cosmetics, see Juvenal (*Satires* 6.457-73, 486-510) and Xenophon (*Economics* 10.5-13).

21. Pto

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21. Ptolemaïs (perhaps 250 BC)

Introduction

Ptolemaïs is known to us through reference to her work by Porphyry in his *Commentary on the Harmonics of Ptolemy*. He tells us that she came from Cyrene and gives the title of her work, *The Pythagorean Principles of Music*, which he quotes. She is the only known female musical theorist from antiquity. Her dates cannot be known for sure. She clearly preceded Porphyry, who was born about AD 232; Didymus, who is also quoted by Porphyry, knew Ptolemaïs' work and may even have been Porphyry's source for it. This Didymus is probably the one who lived in the time of Nero, giving us a date for Ptolemaïs of the first century AD or earlier.¹ Ptolemaïs cites the work of Aristoxenus, a philosopher and musical theorist of the fourth century BC, and so her work must post-date his. Her name suggests that she may have been related to Ptolemaeus of Cyrene, a sceptical philosopher of about 100 BC.²

One of the problems in dealing with this text is that it is in quotation. Porphyry does not clearly distinguish between the text he quotes from Ptolemaïs and his own discussion of the issues raised. He introduces the quoted passages clearly enough (I have provided his introductions in italics), but he does not indicate where the quotation ends. Barker suggests, for example, that the second paragraph of fragment 2 may be Porphyry's own words.³ A second issue is the problem of the accuracy of the quotation. Porphyry says in the introduction to fragment 4 that he has altered a few things in the quotation for the sake of brevity. We should not assume that this is the only quotation to have suffered from editing. On the other hand, where he quotes the same passage twice (fragment 3 is repeated almost verbatim in fragment 4) his consistency is encouraging.

Ptolemaïs' extant work is a catechism, written as a series of questions and answers. She discusses different schools of thought on harmonic theory, distinguishing between the degree to which they gave importance to theory and perception. Her text prefers the approach of Aristoxenus to that of the Pythagoreans, thus she should not be thought a Pythagorean, despite the title of her work.

Ptolemaïs

1.

Ptolemaïs of Cyrene also writes about canonic in her Pythagorean Principles of Music, as follows:

The study of canonic—with whom is it more strongly identified?

Generally with the Pythagoreans. For what we now call 'harmonics', they used to name 'canonic'.

*From what do we get the term 'canonic'?*⁴

Not from the musical instrument called the canon, as some people think, but from straightness, as through this study reason finds what is correct and the regular marks of what is in-tune

They also call 'canonic' the study of pan-pipes and flutes and other musical instruments, although these are not actually 'canonic', but they say these are canonic too because the ratios and theorems

apply to them. So, rather, the instrument was called the canon from the study of canonicus. Generally, a 'canonicus' is a harmonic-theorist who makes calculations about what is in-tune. Musici and canonici are different. For they call harmonic theorists who begin from perceptions 'musici', but Pythagorean harmonic theorists are called 'canonici'. But generically they are both musical theorists.

2.

She adds to this, again by question and answer:

From what principles has the theory to do with the canon been constructed?

From those principles postulated by the musici and those taken up by the mathematici.

The principles postulated by the musici are all those which the canonici take up from perceptions, such as the existence of harmonious and discordant intervals and the octave being a compound of the fourth and fifth, and that a tone is the excess of the fifth over the fourth, and things like that. The principles taken up by the mathematici are all those which the canonici study theoretically in their own way, only starting their study from the starting points that come from perceptions, such as that the intervals are in ratios of numbers, and that a sound is from numbers of collisions, and other principles of that kind. So one could define the postulates of canonicus as existing within the science of music and within the science of numbers and geometry.

3.

Ptolemaï's writes about these things in the introduction mentioned above, as follows:

Pythagoras and his successors want to adopt perception as a guide for reason at the beginning, as if to provide a spark for it, but to treat reason, when it has started off from such a beginning, as separating from perception and working by itself. So if the composite whole is found in a study by reason to be no longer in accord with perception, they do not turn back, but make their own accusations, saying that the perception is mistaken, and that reason by itself finds what is correct and refutes perception.

Some of the musici who follow Aristoxenus hold a contrary position. They adopt theory based upon thought, but advance through expertise on musical instruments. For they regarded perception as authoritative, and reason as accompanying it, and for necessity only. According to them it is quite reasonable for the rational postulates of the canon to be not always in harmony with the perceptions.

4.

Ptolemaï's of Cyrene wrote about these things briefly in her introduction, and Didymus the musical theorist went into them at greater length in his On the Difference Between the Aristoxenians and the Pythagoreans. We shall write out what they both say, changing a few things for the sake of brevity. Ptolemaï's writes as follows:

What is the distinction between those who are eminent in the field of music?

Some preferred reason itself, some perception, and others a combination of both together. On the one hand, all those of the Pythagoreans who enjoyed disputing with the musici preferred reason, saying that perception should be dismissed entirely, and reason brought in as an autonomous criterion by itself. But they are entirely refuted by their adoption of something perceivable in the beginning and their forgetting of this fact. On the other hand, the instrumentalists preferred perception. They gave no thought at all (or very little thought) to theory.

What is the distinction between those who preferred a combination of both?

While some adopted both perception and reason in the same way, as being of equal importance, others took one as the leader and the other as a follower. Aristoxenus of Tarentum adopted them both in the same way. For neither can what is perceived be composed by itself without reason, nor is reason

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1. See A.
2. Diog.
3. Barke
4. A can
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strong enough to establish something if it does not take its starting points from perception, and the conclusion of the theorising does not agree again with the perception.

In what way does he want perception to be in advance of theory?

In order, but not in importance. For he says when what is perceptible whatever it is, is grasped, then we must promote reason for the theoretical study of it.

Who treats both together?

Pythagoras and his successors. For they want to adopt perception as a guide for reason at the beginning, as if to provide a spark for it, but to treat reason, when it has started off from such a beginning, as separating from perception and working by itself. So if the composite whole is found in a study by reason to be no longer in accord with perception, they do not turn back, but make their own accusations, saying that the perception is mistaken, and that reason by itself finds what is correct and refutes perception.

Who holds a contrary position to this?

Some of the musici who follow Aristoxenus. They adopt theory based upon thought, but advance through expertise on musical instruments. For they regarded perception as authoritative, and reason as accompanying it, and for necessity only.

Notes

1. See A. Barker (ed.), *Greek Musical Writings*, II (Oxford: Clarendon Press, 1997), 240.
2. Diog. L. 9.115.
3. Barker, *Greek Musical Writings* II, 240.
4. A canon was originally a ruler for measuring length and straightness, and canonicus meant 'regular' before taking on a more technical meaning in musical theory. Ptolemaïis also refers to a monochord musical instrument that was called a canon. On this, see *ibid*, 239.