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Attempts to reconstruct the philosophy of the early Pythagoreans, comparing its task to that of an archeologist who endeavors to reconstruct a work of art out of a few remaining scattered fragments. Identifies three doctrines of the Pythagoreans from which the intended reconstruction is to be made: (1) the transmigration of the soul, (2) the view that all things are numbers, and (3) the table of opposites. Maintains that an examination of these three doctrines yields the picture of Pythagoreanism as a unified philosophical system which is not merely a way of looking at the world, but also a way of life. Ref. 100.

along with frgs 11-14. Cf. also frg B 2: εἰ and conditional (ἄρουντο, εἴη, λάχοι).
 28. Cf. Xenophanes' *axiocratic* criterion to an *axiomatic* or *hedonistic* one.

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THE UNITY OF PYTHAGOREAN PHILOSOPHY

When philosophers or historians of philosophy try to understand the teachings of the pre-Socratic philosophers, philosophy comes very close to archeology. Like an archeologist constructing a fresco or a vase out of the few fragments which remain of the original, the philosophical student of the pre-Socratic must take remaining fragments of a pre-Socratic philosopher, often quotations or paraphrases by a later philosopher, and attempt to reconstruct a complete whole. Like the archeologist, the philosopher is guided by his or her own ideas of what the complete whole was probably like; the fragments "underdetermine" the whole; many reconstructions are possible and more than one is probable. The history of the "saffron gatherer"¹ fresco from Knossos should remind us that later reconstruction may be radically different from quite plausible early reconstructions.

With Pythagoras and the early Pythagoreans, we have no surviving pieces of original documents, and nothing even which is beyond dispute a direct quotation from the pre-Socratic sources. At least since Aristotle philosophers have been puzzling over what was actually taught by the half-legendary Pythagoras and his earliest followers. This paper is an attempt at a reconstruction of early Pythagorean philosophy which shows it as a unified system. Due to the limitations of length I can only take a few pieces of the puzzle and try to show how they fit into a briefly sketched larger structure.

The pieces of the puzzle which I will use are those which almost everyone agrees were part of the primitive Pythagorean doctrine:

- (A) The transmigration of the soul
- (B) The view that everything is "made of" numbers
- (C) The Table of Opposites

- (D) The view that philosophy is a "way of life," a "brotherhood" in a sense which, say, mathematics or history is not
- (E) The dietary prohibitions.²

If I can fit these pieces together into a coherent framework, there is hope that other pieces of the puzzle may find their place in the same framework.

In my project of reconstruction, what Plato, Aristotle or even Philolaus say about Pythagoreanism has a two-fold function: we can *infer* from what they say about Pythagorean philosophy what the Pythagoreans actually said, but we must separate these inferences from *their* reconstructions of what the complete Pythagorean system was. When Aristotle says the Pythagoreans said that "all things were made of numbers," we take this as *data*, and when Aristotle tells us whatever the Pythagoreans *meant* by this we regard this as a *rival reconstruction*.

I begin with some reflections on the nature of numbers. I mean here the natural numbers, and I reflect only on those characteristics of natural numbers which must be admitted by any tenable theory of number. *First*, then, each number has an *essence*, a property or properties which *only* it has and which it *must* have if it is to be that number.³ (What exactly constitutes the essence of a number is controversial, and does not matter for present purposes.) *Second*, numbers have many essential properties which are not essences; these properties such as being odd or even, prime or non-prime are properties which that number could not lack and still be *that* number, but which are not properties which *only* that number has: there are many odd numbers, even numbers, prime numbers and non-prime numbers. *Third* numbers form an *ordered system* in which each number has a unique place. These three characteristics of numbers are ones which are revealed by any competent philosophical reflection about numbers: they were certainly known to the Pythagoreans.

The result of applying those elementary considerations about numbers to the basic Pythagorean views gives us our first thesis. By saying that all things were made of numbers, the Pythagoreans were saying *at least* that the basic constituents of everything

- (i) have essences
- (ii) have essential properties and
- (iii) form part of an ordered system in which each thing has a unique place.⁴

A corollary of this thesis is that the soul either is or is constituted of, something with these three basic characteristics: an essence, essential properties, and a unique place in an ordered system. Notice that this makes the notion of the transmigration of souls logically intelligible: if I were to claim that the soul of Pythagoras was the same as the soul of Euphorbus, I would be claiming that it had the same essence, the same essential properties and the same unique place in

an ordered system. We thus begin to see how parts (A) and (B) of the primitive Pythagorean doctrine are connected.

Let us now consider the way the Pythagoreans *represented* numbers.⁵ They used physical counters such as pebbles or marks on paper to construct numbers according to one of two patterns. *Odd* numbers began with one, represented as a single pebble or dot and build up each succeeding odd number as an L-shaped "gnomen" around the preceding number. The first several additions of odd numbers look like this:

Start with	.	Add	.	to get	.		
							add
	.		.	to get	.		
	.		.		.		
							add
	.		.	to get	.		
	.		.		.		
	.		.		.		
							etc.

(Note that though the "gnomen" number is always odd, the total "array" alternates between odd and even (odd + odd = even, even + odd = odd). However, the "picture" of a number formed in this way is always a *square* with each side the same.

Even numbers begin with two and build up a "gnomen" with *unequal* "arms" around it in this fashion:

Start with	.	Add	.	to get	.		
	.		.	to get	.		
	.		.		.		
							etc.

Note that every *gnomen* and every array have an even number of elements (even + even = even). The "picture" of a number given by this method is always a rectangle *but* the ratio of side to side constantly *changes*: 1:2, 2:3, 3:4, etc. We can now see why in the "table of opposites" we have

Odd	Even
Rest	Change
Limit	Unlimited

The procedure for "building up" off numbers gives us a "stable" figure always a square with sides *n* and *m*, where *n* and *m* *must be* the same. The procedure for building up even numbers gives us a rectangle with sides *j* and *k* where *j* and *k* *must be* constantly changing. We can see why "odd" and "rest," "even" and "change" go together and why "limit" (always the same proportion) and "unlimited" (constantly changing proportion) go with "odd" and "even."⁶

Let this stand as a connection between the Pythagorean view of numbers and the table of opposites; I lack the space to consider how, if at all, the remaining pairs

light	dark
male	female
good	evil

relate to what has been said (if they do) and whether these are part of the primitive Pythagorean "table of opposites" or are later additions. (I would argue that "right" and "left" are fairly clearly interpolations and "straight" and "curved" must be later additions.)⁷

Now consider the picture of reality we have so far. If each soul has an essence (or is a compound of things which do), we can make sense of the notion of transmigration. This soul was the soul of Euphorbus and is now the soul of Pythagoras. The body is not the same, the memories of Euphorbus do not necessarily carry over to Pythagoras (though legend says that in this case, they unusually and perhaps uniquely do). So what does it *mean* to say the soul is the same?⁸ Precisely that it has the same essence. Thus a persistent problem in the area of philosophy of mind receives a plausible answer in the context of the Pythagorean system.

Consider now a problem in general metaphysics. How is it that certain things are unchanging, others are changing? (That this was *true* seemed obvious to most Greek thinkers.) Pythagoreanism answers: "Just as certain things with numerical essences have the essential property of being stable and unchanging and others have the essential property of generating change, so some essences of things in the world admit change and some essences of things in the world do not." If we go on to say that given enough time everything which *can* change *does* change, we have an *a priori* answer to why change occurs and why some things are changeless. Is this answer naive or question begging? Not necessarily. How could anyone answer the question "why is it that trees change but numbers do not?" without giving as part of their explanation that trees and numbers are different *in nature*, that is in their essential properties.⁹

We can now tackle element (D) of the Basic Pythagorean doctrine. Why did the early Pythagoreans regard Pythagoreanism as a way of life? Basically because if you believe that you have a way of giving definitive answers to questions which requires "special access" —special talent, training or selection— your philosophy tends to become a theology and your philosophical movement tends to become more like a church or a political cause. Recent examples of philosophies which claimed that special techniques led to definitive answers for traditional philosophical problems were Marxism, Existentialism and Phenomenology on the Continent and Logical Positivism and Wittgensteinianism in English-speaking countries. An even more recent example is Deconstructionism in philosophy and literary criticism. Anyone familiar with these movements is struck by the extent to which they become ideologies with standards of orthodoxy and heresy, with revered prophetic figures whose teachings are revered and subjected to exegesis, but not fundamentally challenged. In contrast to the philosopher whose philosophy is merely a job which does not fundamentally alter his or her outlook on life, proponents of these views tend to see them as Pythagoreans saw their phil-

osophies, as something which calls for a commitment and a change of life.¹⁰

There is ample evidence that both the philosophy of the Academy and the Peripatetic philosophy tended to become ideologies in this sense also, and the Stoics notoriously formed a special group with distinctive standards of dress and behavior.

It is in this context that even the dietary prohibitions make sense. An elite group often separates itself from others by distinctive ways of doing ordinary things, and eating has always been a favorite way of self-distinction. Familiar examples are Jewish dietary prohibitions and Christian abstention from meat in Lent and on Fridays.

Why the very odd and very emphatic rejection, for example, of beans? Probably the *origin* of such prohibitions is not recoverable from the data we have, but let me add one more bit of speculation to the plentiful speculation in this area:

Some of the older prohibitions in the Jewish Law such as "Thou shalt not boil a kid in its mother's milk," have been discovered to be prohibitions of rites which were part of the pagan religion which surrounded and was a constant threat to Judaism. Some of the Christian prohibitions against meat originated in a prohibition of meat left over from pagan sacrifices ("meat offered to idols"). Is it not possible that some of the odder Pythagorean prohibitions were prohibitions of rites or foods belonging to nature cults with a superficial resemblance to Pythagoreanism, from which the early Pythagoreans wished to sharply distinguish themselves?¹¹

Later Neo-Pythagorean schools were in fact vegetarian; a more rational and rationalizable prohibition which served the same social function as the earlier more arbitrary prohibitions; distinguishing the "elect" group from the mass of the "non-elect" who surrounded them.

As my last series of remarks suggest, I want to draw some morals for present-day philosophy from the Pythagoreans. We may or may not want to agree with the Pythagorean that the basic elements of the universe have essences. That would solve a great many problems, but raise a great many more. After a period of skepticism about essential properties, many philosophers are now returning to this idea, whose advantages seem greater than its difficulties. That all of reality forms an *ordered* system in which each thing has a unique place is deeply controversial, but that reality has a mathematical structure can hardly be doubted in the light of modern science. But the table of opposites and its associated metaphysics of the changing and unchanging would need a great deal of bringing up to date.¹²

Finally should philosophy be regarded as a way of life or just a job? My own view is that it is a way of life, but not for the Pythagorean reasons. We philosophers are a brotherhood (and sisterhood) not because we know a way of settling in principle all philosophical problems, but because we know there is no such way. We are not the Wise, but the Lovers of Wisdom; often the seemingly unrequited lovers. We are the sons and daughters of Socrates, not of Pythagoras.

On this basis of shared seeking, shared love of Truth I am willing to call any philosopher my brother or sister, though I may profoundly disagree with the truths they think they have found. And if there were some recognized symbol of the philosophical calling, I would be proud to display that symbol. But it should not, I think, be the tetractys. Perhaps, as a reminder of the dangers of our vocation, it should be a sprig of hemlock.

NOTES

1. The figures gathering saffron in this fresco were first reconstructed as human figures, then as monkeys. An examination of the way in which such frescoes are reconstructed is more than a metaphor for philosophical reconstruction: it provides valuable hints. Among them is the necessity of clearly distinguishing the original material from the reconstructed linking material.

2. I take it that Aristotle is our best witness to pre-Socratic Pythagorean doctrine, partly because he seems honestly puzzled by some elements of the view, which is a good sign that he is reporting not reconstructing. Whatever we say about the Philolaus fragments they agree with Aristotle on the points I have listed.

3. The notion of an "essence" has received considerable attention in recent analytic philosophy; some interesting current discussions are contained in *Alvin Plantinga* edited by James E. Tomberlin and Peter van Inwagen (Dordrecht, D. Reidel Publishing Company 1985).

4. Of course what it means for a number to have an essence, etc., will differ in different philosophies of mathematics. With regard to things other than numbers the theses are independent: you could e.g., reject essences but not essential properties, or accept both but reject a unique ordering.

5. Despite its age, Sir Thomas Heath's *A Manual of Greek Mathematics* (London, Constable and Co., 1931, New York Dover Publications, 1963), probably still gives the best account of Pythagorean mathematics. For "figured numbers" see p. 43 sqq. See also, *Greek Mathematical Philosophy* by Edward Mazarz and Thomas Greenwood (New York, Frederick Ungar Publishing Co. 1968). Chapters 2-4.

6. Mazarz and Greenwood (Op. Cit.) suggest that "As an odd number is not divisible by two, it sets a limit to bipartition and is therefore limited" (p. 37). This is ingenious, but I think not sufficiently fundamental.

7. It might seem that at least one curved figure, the circle, is "limited" in the same sense a square is: a circle of any diameter is always the same *shape*. Motives for saying curved figures belong in the "unlimited" column would depend on a more sophisticated geometry than is likely for the pre-Socratic Pythagoreans.

8. On the difficulties of a reincarnational theory where we do not have some idea of an essence for the soul, see *My Thinking About Religion* (Englewood Cliffs, New Jersey, Prentice-Hall, 1978) pp. 102-3.

9. On problems of explanation by the nature of the thing being explained, see *Thinking About Religion*, pp. 8-10.

10. No "school" of philosophy since ancient times has gone so far as to have a distinctive way of dressing or style of life. But such philosophical schools as Kantianism and Hegelianism in the eighteenth and nineteenth century and had many of the characteristics of a "theology" or "ideology." In the middle ages a school of philosophy was often associated with a particular religious order, so we get "Dominican" and "Franciscan" schools of philosophy looking back to Aquinas and Bonaventure.

11. There is reason to think beans are a more "primitive" food than grain (more easily eaten

raw, more easily cooked) and religion has a tendency to encapsulate older forms of food, dress, etc. in ceremonies. Further archeological work might yield some evidence of a nature religion with beliefs or ceremonies connected with beans at a time and place where it could be connected with early Pythagoreanism.

12. That the basic structure of matter is "mathematical" and even that the basic units of matter resemble mathematical entities more than they do large-scale objects are familiar ideas in modern physics. In this sense it is the Pythagoreans rather than the Atomists who anticipated modern physics.

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