

Mita Darbari

Ecology, Mathematics and Pythagoras

Pythagoras and Mathematics is understandable but Ecology is, comparatively, a new term and what it has to do with Pythagoras who lived almost two thousand and five hundred years ago? Pythagoras is, according to Bertrand Russell, intellectually one of the most important men that ever lived.¹ The term “ecology” is derived from the Greek word *oikos* meaning “household”.² The house (*oikos*) is a place where its inhabitants relate to one another and dynamically interact. As the house provides a shelter for people to live, in the same way, the universe provides a haven for the infinite manifold of unanimated and animated forms to exist and evolve together. Pythagoras may have been the first to use the term *cosmos*³ to imply that the entire universe has order, which could be understood by mathematics as he postulated that the natural laws of harmony of the microcosm of music, of the human soul, biological life and of the cosmos were identical.

Pythagoras, considered as the father of pure mathematics, not only studied Mathematics but tried to answer many philosophical questions, which are still uppermost in the minds of those who are concerned with existence, ethics, the human condition, and our relationship to the nature. For Pythagoras, Mathematics and geometry were sacred tools for uncovering the true nature of the universe. Pythagoras taught that the entire universe is one vast system of mathematically correct combinations.

Among the Pythagoreans the *monad* was the first thing that came into existence. It was the number one, identified by the Pythagoreans with the unit point that was the epitome of exact objectification. From the unit point came all the numbers, and from numbers came the whole universe.

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The Pythagoreans considered the Monad as the beginning of all things, just as a point is the beginning of a line, a line of a surface, and a surface of a solid, which constitutes a body. A point implies a preceding Monad, so that it is really the principle of bodies, and all of them arise from the Monad. (4)

Pythagorean dualism is expressed in terms of ten contraries (The Ten Pythagorean Principles): limit and unlimited, odd and even, one and plurality, right and left, male and female, resting and moving, straight and curved, light and darkness, good and bad and square and oblong. The contraries odd and even, square and oblong are related to the Pythagorean representation of numbers as patterns of dots.

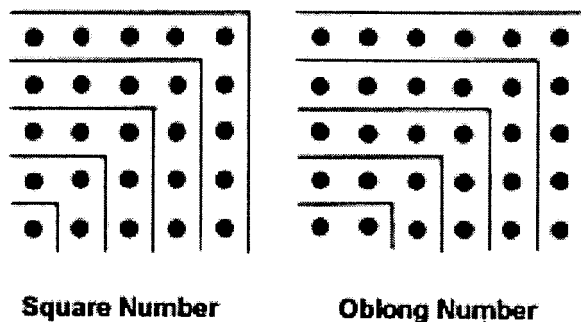


FIGURE 1

The reconciliation of these opposites creates harmony. For human behavior, this was harmony resulted from behaving temperately or by exhibiting moderation. One, the Monad, was the principle of Unity from which all things begin. Two, the Dyad, was Duality. It was both the beginning of strife and the possibility for the development of relationships between things, as everything is no longer the same. The Triad, Three, forms a bridge, allows relation between the two extremes. According to Porphyry,

Things that had a beginning, middle and end the Pythagoreans denoted by the number Three, saying that anything that has a middle is triform, which was applied to every perfect thing. (5)

The Pythagoreans called the number *Four* the "Key-bearer of Nature." This was because, as mentioned before, numbers are an arrangement of points. One point represented the number one, the beginning of all geometrical matter. A point has no length, breadth, or thickness (with zero dimensions). When the number one goes from the world of concept to the world of matter, it is

extended and becomes divisible, thus allowing for two. The first extension into the first dimension is a line. The line has length, but no breadth or thickness (one dimension). It is the dyad, polarity. A triad is superface with length and breadth. It is the visible (two) dimensions. Three points represent a surface. It is a trinity. The number four may be described geometrically as the first solid: It has length, breadth, and thickness. It takes us into the third dimension. (Figure 2) It has been described as the first descent into matter. Four is also, coincidentally the number of elements that exist: air, fire, earth, and water. From these elements comes the world.

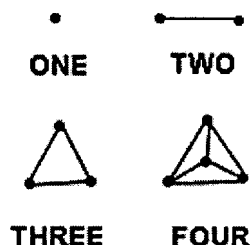


FIGURE 2

Pythagoras taught that both man and the universe were made in the image of God; that both being made in the same image, the understanding of one predicated the knowledge of the other. He further taught that there was a constant interplay between the Grand Man (the universe) and man (the little universe). Pythagoras said that man was a microcosm; which means, a compendium of the universe not because, like other animals, even the least, he is constituted by the four elements, but because he contains all the powers of the world. For the world contains Gods, the four elements, animals and plants. All of these powers are contained in man. He has reason, which is a divine power; he has the nature of the elements, the powers of moving, growing, and reproduction. However, in each of these he is inferior to the others. For example, an athlete who practices five kinds of sports, and diverting his powers into five channels, is inferior to the athlete who practices a single sport, so man having all of the powers, is inferior in each. Than the gods, we have less reasoning powers; and less of each of the elements than the elements themselves. Our anger and desire are inferior to these passions in the irrational animals; while our powers of nutrition and growth are inferior to that in plants. Constituted therefore of different powers, we have a difficult life to lead. (6)

Although dualism was evident throughout Nature, the fusion of opposites held the secret of balance. Only in Oneness was true identification with God possible. God was equated with love, which pervaded the entire universe. The soul of the individual and that of the Earth and universe were intimately linked. There are even some faint allusions that both Pythagoras and Plato seemed to regard the living beings of the Earth as the eyes and senses of God. This microcosm-macrocosm idea, which seems ever more pertinent today in a world racked by fragmentation, is in fact strikingly similar to the contemporary concept of deep ecology, which believes in the absolute relativity of existence. But to Pythagoras, this was not merely confined to the material world. He viewed death as a passageway on the continuing journey of the immortal soul, whose re-incarnation would be determined by the values of previous deeds. A devout vegetarian, who considered animal sacrifices in the temples to be a sacrilege, (7) he believed that pain inflicted upon Nature would inevitably return to haunt humankind, both spiritually and physically.

According to Porphyry, (8) Pythagoras taught that the soul was immortal and that after death it transmigrated into other animated bodies. After certain specified periods, the same events occur again; that nothing was entirely new; that all animated beings were kin, and should be considered as belonging to one great family. And hence Pythagoras taught that friendship was the truest and nearest perfect of all relationships. He declared that in Nature there was a friendship of all for all; of gods for men; of doctrines one for another; of the soul for the body; of the rational part for the irrational part; of philosophy for its theory; of men for one another; of countrymen for one another; that friendship also existed between strangers, between a man and his wife, his children, and his servants. (9) Pythagoras taught that all animated beings were kin, and should be considered as belonging to one great family and so he believed in universal friendship and hence he commanded: (10)

Not to destroy or injure a cultivated tree, nor any animal either which does not injure men.

Pythagoras not only saw vegetarianism as the key to peaceful human co-existence but also recognized the health advantages of a meat-free diet.

... he even forbade men to kill animals at all, much less would have allowed his disciples to eat then, as having a right to live in common with mankind.(11)

For Pythagoreans, all souls spring from the same source and inhabit every living thing. It follows from this that all living things are related and there is literally a kinship of nature. Their beliefs about the soul in conjunction with their view the Cosmos is harmonious leads them to the ethical position that the task for human beings is to ensure that they live in conformity with the harmony of the cosmos. This can be achieved by following the ethical principles laid down by the community.

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A HISTORY OF EARLY PYTHAGOREANISM

My research concerns one of the most vexed problems in early Greek philosophy and science. Pythagoras, arguably the most influential thinker among the Pre-Socratics, is at the same time the most elusive one. He was not the only Pre-Socratic who left no writings, or the only one involved in religious and political activity. It is rather a peculiar combination of these (and many other) circumstances that made him such a controversial figure. Most of the Pythagoreans, however, were as 'normal' as any other Pre-socratic. Their 'normality' ensured the continued existence of Pythagoreanism as a philosophical and scientific school, after the political domination of the Pythagorean societies in Italy was destroyed and the legend of Pythagoras became a part of popular tradition. Continuing my earlier studies in Pythagoreanism my future book attempts to analyse in detail every major aspect of Pythagorean activity against its own background: religious, political, philosophical and scientific.

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* The Netherlands Institute for Advanced Study (NIAS) in Wassenaar offers "A year to think" to approximately fifty carefully selected fellows each year. Scholars who have already made a significant contribution to their field are given the opportunity to devote themselves exclusively to their own academic projects for a ten-month period, individually or as part of a research theme group.