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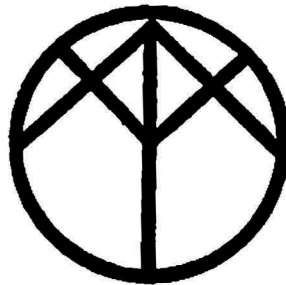
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PYTHAGOREANISM AND THE OBJECTIVITY OF THOUGHT

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«That's what you think» is the frequent reaction at the close of a serious discussion whose conclusion collides with the personal interest of someone.

The expression reflects a conception of the nature of thought which deserves careful consideration. According to this view thinking is a subjective process the results of which express the point of view of the individual thinker but which have no necessary validity for any other individual and for his point of view. In other words thinking has no objective validity. If the conviction of one person happens to agree with that of another it is purely a matter of chance, an accident of the moment, with no necessary connection between the two. No one can think for people in general; each person must think for himself; and his results will be valid for him only. All we can ever do is count the votes on one side of a question or another, and determine probabilities and policies by the result of statistics.

The suggestion that one must think for oneself is important but misleading. What it means is that one must not passively accept opinions offered by others without subjecting them to critical scrutiny. This active attitude which one should assume is interpreted as a process of absorption, not one of self-enlargement. It is taken as attaching something external to oneself instead of merging oneself into a larger reality that is transcendent to one's previous self.

But the life of any finite individual is a dependent existence. It is only by drawing from the environment about us that we maintain life; then we return the remnants of what we have used. So human thinking is partial. It stands related to the lives of persons, and to the total system of thought in which it is an element and which constitutes the body of science and of knowledge in general. The activity of thinking is a phase of the philosophy of loyalty which Professor Josiah Royce, of Harvard University, described a half-century ago. He who undertakes to think commits himself to the all inclusive obligation to aim at truth, to avoid self-contradiction and to pursue ever increasingly the total field of data which embody the truth. Whatever other aspects truth has it possesses internal coherence in form and constantly enlarging totality in content.

These attributes science, mathematics, history, etc., constantly display. When accepted as valid the thoughts of one mind fit into those of another. They supplement one another, and together build a larger structure than any one can be. Their satisfaction comes in the sense of having participated in the growing structure of human thought. The reward is not in domination but in contribu-

tion. Some have seen in this the onward sweep of relentless power, as Bergson and Russell have. But others have seen in it an opportunity to join in the eternal life of the Universe. Those who call it relentless fate overestimate their own significance, demanding that the course of things regard first their will. Those who, on the other hand, see in it relation to an all-inclusive stream of consciousness speak their attitude in the words: «Not my will but Thine be done». The former theory offers little of satisfaction to most people, for not many can be dominant. The latter view offers something to everyone, for each can make his contribution however limited. However, we must choose our doctrine not on the basis of emotional encouragement, but on the degree in which it best describes actual reality. And this the second theory does.

It is in line with the view developed by Royce in his «World and the Individual» in 1901, and re-asserted by Brand Blanshard, of Yale University, in his «Nature of Thought» in the 1940's. According to this view thinking is a progressive struggle from the expression of internal meanings to the expression of external meanings. The outlook of an immature mind is dominated by its immediate interests, the concern first of all with one's physical survival, and with the recognition of one's place and significance in the scheme of reality. At this level all experiences are self-centered, and are evaluated with reference to their relatedness to this center.

But as experience grows, and mind matures, if it has the wit to profit from experience, it expands and develops beyond its earlier condition, and this expansion, if it is growth in knowledge, is an ever nearer approach to reality. It is a vindication of the assertion of Parmenides that thought and being are one. As thought perfects itself then it increases its identity with the real. It becomes more objective. It is because thought is already real that it can by its enlargement bring us more of the real. The mind with good judgment is not swayed by a limited motivation. It realizes increasingly the role of impartial spectator. Its conclusions are valid for all thinkers, not for just one.

Complete objectivity is not attainable by a finite mind, of course. This remains the goal toward which we work. One of Plato's wisest remarks is the one in the *Phaedrus* where he represents Socrates as saying of aspirants after wisdom. «Wise I may not call them, for that is a great word worthy of God alone, lovers of wisdom is their modest and befitting title», —not σοφοί but φιλόσοφοι. This difference of maturity was what led to the classic Greek distinction between opinion (δόξα) and truth (ἀλήθεια). And in recent times, using a mathematical analogy, opinion has been regarded as possessing degrees of probability approaching truth as a limit, in the way in which a curve may approach an asymptote. It will never touch it this side of infinity, but the shape of the curve indicates where the asymptote lies, and opinion can be measured by truth as an ideal standard which thought is always trying to reach. It sug-

gests the statement of William James that « the absolutely true is the distant vanishing point toward which we hope that all our temporary truths will some day converge ».

From the standpoint of the history of thought the issue of subjectivity and objectivity was the issue between the Sophists and the followers of Socrates and Plato. When Protagoras said « Man is the measure of all things » (πάντων πραγμάτων ἄνθρωπος μέτρον) he set each man apart from every other man, with no connecting link between them whereby their thinking might become a possession in common, and serve as a means of unifying minds, first in theory, then in practice, in conviction and in cooperation.

In modern times this interpretation has grown out of a biological theory of thought. Professor Charles H. Judd of Chicago classed psychology as a biological science ; and it has been regarded as comprehensive and inclusive of all aspects of experience. The close connection of mental activity and brain processes has favored the biological view. It has even led to the famous expression of the early nineteenth century materialists — « The brain secretes thought as the liver secretes bile. »

But those who hold this view of thought seem never to stop and consider the paradoxes to which it leads. For if thinking is merely personal self-expression without universal, objective, validity in any case no communication of thought ever really occurs. And if none occurs then it is impossible even for those who maintain the theory to tell others that they maintain it. And the fact that they have told others belies their own theory. Either thought is not such as they have declared it to be, or there is another process which performs the function earlier ascribed to thought. If there is such another process then it is far more important than thinking, and it must be the mental activity which has produced science with its inclusive validity.

The interpretation of thinking as purely subjective leads to complete solipsism and skepticism as it did in the case of the Sophists and their successors, through the whole tradition of the Skeptics. This commits us to continuous silence, for attempts at communication are futile. Even those who reduce all to counting statistics overlook the fact that they are assuming the objectivity of the process of counting.

One cause, fundamentally, of the subjective interpretation of thinking is the numerous disagreements among individuals. The actual situation affords too much apparent evidence of the truth of Sophistical individualism. Yet it can not be the whole story, or it could not state its own case. To observe only the disagreements among men is to see only a part of the picture. There is some agreement, some unanimity, on certain propositions uttered as truth. There are areas in which there is much agreement ; some in which there is complete agreement. In other words there are degrees of success in the efforts to attain

objective validity. Thus we here all agree that discussion is good, even obligatory, though we may not agree on the details of content or in the placing of emphasis upon one proposition or another. On this we would probably fall into groups with internal agreement among the members of a single group, but with divergence between one group and another.

The subjective view is paralleled by the wide use of the term « rationalize » in many quarters. Certain psychologists declare that all that men do is « rationalize » their practices and opinions. This means that the basic activities of life in practice and in theory are determined by subconscious and inherited biological and physiological urges which are reflex organic responses to circumstances. No one ever does anything because he thinks, rather he thinks as he does because he acts as he does. On this presupposition there is no such thing as planning one's life. So-called 'Plans' are always retrospective summaries of modes of activity already adopted, and determined by involuntary responses. In fact voluntary response is impossible. We think of voluntary action as involving deliberation as a necessary element in its structure. And without the possibility of deliberation there is no possibility of volition.

It ought to be obvious that such a theory is impossible of acceptance. It would mean that the whole attempt to apply the principles of conduct formulated, for example, by the Pythagorean system of thought, could never be deliberately adopted and put to work in life in order to raise its level of operation and improve the character of human beings. This entire congress would be futile from the beginning. But who of us here believes that ?

In fact it would mean that none of us came here because he thought of coming, chose to do so, and came because of his thinking, because of his conviction of the worthwhileness of such a meeting, and the desirability of setting into operation a way of life based upon present deliberations.

It has always seemed strange to me that those who hold that human mental activity is merely rationalizing, have not realized that if this is true, then all their own mental activity, also, is merely rationalizing. And as rationalizing has no objective validity the theories of these men also have no validity, and so have no more force than the doctrines they constantly condemn.

It is strange that those who aim to be scientific in their work do not proceed inductively from what actually occurs and is implied in what occurs, to their formulated description of the state of the world. The theory they develop should apply to their own case, and their own activity should be an instance of its meaning. But this is impossible for those who assert that human thought never represents fact. Those who criticize others as merely rationalizing do so on the tacit assumption that they at least have found a method which is not mere rationalizing. If this is true then it will become possible by analyzing their technique to formulate a set of principles of procedure which will escape the charge

of mere rationalization, and afford a method of thinking which will attain that type of objectivity and universal validity which science seeks and which it is commonly believed to have attained in some degree.

The way in which consciousness transcends brain activity has never been sufficiently considered by the biological theory. Physical states including those of the brain are always facts of the present moment ; but consciousness reaches back into the past by way of memory, across space to objects of attention that are often very remote physically, and into the future by anticipation. Leibniz, Berkeley and Kant called attention to this, telling us that space is in the mind rather than mind in space. William James once said in his famous study of human experience entitled « Principles of Psychology », that when consciousness attends to an object it is epistemologically present at the object. So when I think of the mountains on the moon I am mentally at the moon though not dynamically there. If mental presence were identical with physical presence it would never be possible to think of the Nebula in Andromeda, for it is a million light-years distant. It would not even be possible in historical imagination to go back to the time of Pythagoras, for the time interval between his day and ours is not to be compassed by any man. Whatever the connection of thought and brain may be, thought is certainly not limited to the scope of the physio-chemical processes occurring there. It reaches out beyond the brain to make connection of the organism with its environment and to give present action a place in all space and time.

As one of the best examples of the true character of thought we may cite the Pythagorean Theorem which states the interrelation of the three sides of a right triangle. It is often said in a general way that this theorem was known to the Egyptians and Babylonians before the time of Pythagoras. But so far as any evidence I have seen this is an inaccurate statement of the situation. The Egyptians and Babylonians found themselves facing the problem of the theorem. They discovered empirically that if one side of a right triangle measures three units, and the other four, then the hypotenuse will measure five. And this is a very important fact which has useful practical applications. But when the dimensions of the sides were other than three and four (or their multiples) then the length of the hypotenuse was not exactly known; it could only be empirically approximated. This is a very different situation from that of Greek geometry.

The strength of the Greek grasp of the theorem lay in the fact that it showed the relation to be universal, without reference to the dimensions of the sides. It was demonstrated on the basis of pure mathematical concepts, not on the basis of arithmetical numbers. The concepts of 'square', 'perpendicular', 'parallel', 'rectangle', 'straight line', 'triangle', 'base', 'altitude', etc. make inevitable the interrelation as a consequence. And as these concepts are defined in purely formal terms, without regard to specific numerical values, the theo-

rem as a logical complex of them is valid without respect to numerical values, that is, universally in the realm of Euclidean space.

This generalization to universality by means of pure concepts is the distinctive feature of the Greek treatment of the problem. And it was this which constituted the greek advance beyond all previous thinking. This the Egyptians and Babylonians never succeeded in doing. But this is the real essence of thinking in the significant sense of the term, that is, the use of universal ideas. As a consequence we say that the Greeks taught humanity to think. In this respect they hold a unique place in the history of human evolution that can never be altered ; and it is the most important contribution that any nation has ever made because it is this activity of thinking which distinguishes man from other animals. It is the key to all progress in science, history, theology, philosophy, literature, aesthetics, — in whatever field man asks questions demanding reasoned answers. This is the full sweep of the famous sentence of Socrates : δ βίος ἀνεξέταστος οὐ βιωτός.

The significance of the Pythagorean Theorem for scientific thought is readily seen on a moment's reflection. Without it the branch of mathematics called Trigonometry would not exist. Without this Analytic Geometry and the Infinitesimal Calculus would be impossible. And without these contemporary engineering could not undertake its projects. Thus it seems clear that the Pythagorean Tradition is central to all intellectual progress in theory and application.

Now it is to be noted that the validity of the Pythagorean Theorem is not a matter of any one's personal opinion. We can not say to the mathematician who demonstrates it : «that's what you think». Having demonstrated its truth for himself he has done it for all thinkers. He has shown that the assertion «That is what you think» is a contradiction ; if it is merely your opinion it is not really thought ; if it is thought it is not merely your private view ; it is much more.

Correct thought, in other words, is the most effective bond of union between one mind and another. It brings minds together because it brings each one into unity with reality. As Parmenides, said, — thought and being are one. And if this were not true we could not hope by means of thinking to find out what things are. If thinking were merely spinning a web out of one's own inner self with only self-expression as a consequence, then the more one thought the more he would become involved in himself, and the more he would isolate himself from other persons and from the real. Obviously this is not our real conviction regarding what we do when we construct a scientific interpretation of our observations and experiments. The results of science, theoretical and applied are the best refutation of the doctrine of Protagoras, the subjective view of human thinking. And the Pythagorean Theorem is one of the best expressions of the truth.

If it were true that thinking merely involved us more deeply in ourselves,

and isolated us more and more completely from the reality we are seeking, our only advice could be for all who seek reality to quit thinking. And there are people who would accept this. They are suspicious of reason and of efforts to think, and they would say that the safer policy is to abandon analysis and yield oneself to feeling, to some grand intuition, or something other than thought. Both in the Orient and in the Occident this opinion has been held.

But once, more, it leads to paradox ; for in arguing for the theory its advocates make use of what they decry. They use analysis and argument to show the futility of these. They should maintain complete silence, and let others entirely alone, though in so doing they would abandon the field to their opponets. But just because man is the animal marked by an irresistible impulse to question the situation in which he finds himself he cannot remain merely silent and leave life to involuntary and instinctive impulses. He must go on questioning and thinking in obedience to his inherent impulse to be human, seeking principles that are as universally valid as the Pythagorean Theorem, and as essential to long range application as it has proved to be.

L'APPLICATION DE LA LOI DES NOMBRES DANS L'ÉDUCATION PAR LE GESTE, LE RYTHME ET L'ATTITUDE

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La loi sacrée des Nombres de Pythagore est connue par les initiés. Les profanes en ont une idée très vague ; le sens réel échappe même à la plupart de ceux qui en parlent. Son sens réel serait dans l'application de cette loi sacrée dans la vie de tous les jours, en commençant par le côté matériel pour arriver aux plus hauts préceptes spirituels.

Sans s'étendre sur ce sujet, je me verrai obligée maintes fois de revenir au cœur du problème, pour rappeler l'importance dans l'Harmonie rythmique et plastique des rapports numériques justes, donc de l'application de la loi des Nombres.

Nous ne pouvons pas analyser le mouvement d'une façon trop serrée et artificielle sans lui nuire. Il ne peut être évalué que par la synthèse.

Le mouvement, c'est la vie, et la vie est une continuité au moins apparente, un écoulement d'énergie qui mue la forme.

Entre la matière et l'énergie qui la forme et la transforme, il y a une liaison intime. Matière et énergie ne font qu'un, la forme harmonieuse découle de cette unité de la matière et de la vie qui l'anime. Un bon exemple de cette vérité est l'Art plastique oriental. L'artiste chinois par exemple, prenait une matière, et il faisait sortir de cette matière tout ce qu'elle possédait, comme s'il la travaillait du dedans au dehors, comme si toutes ses énergies pouvaient être utilisées. Chez nous on prend une matière et de l'extérieur, avec brutalité, on lui impose une forme sans compter avec sa vie subtile, ce qui a donné ce côté extérieur et mécanique à notre civilisation anti-humaine et anti-pythagoricienne.

Dans le domaine éducatif par le mouvement, nous voyons les mêmes procédés anti-pythagoriciens et anti-physiologiques on prend un sujet et de l'extérieur on lui fait subir les disciplines mécaniques, sans vie, qui le plus souvent ne sont pas en harmonie avec ses affinités d'ordre intérieur.

Qu'il s'agisse d'une œuvre d'Art ou de l'être humain, la loi de l'unité, loi pythagoricienne, s'impose, comme celle de la voie intérieure dans toute création surgit d'elle-même naturellement. A la base de ces phénomènes est la loi des Nombres, car tout est ordre, harmonie, proportion et Nombre.

Dans tout ce qui est art profond et vrai, des rapports numériques complexes s'opèrent. Le nombre d'or de Pythagore est un nombre incommensurable,