Alfred Korzybski Memorial Lecture

MATHEMATICAL PHYSICS AND KORZYBSKI'S SEMANTICS

F. S. C. Northrop*
Sterling Professor of Philosophy and Law
Yale University

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Madam Director, Mr. Straus, Ladies and Gentlemen:

To participate in honoring Alfred Korzybski is itself an honor. May I begin by putting Mr. Straus a bit at ease about what happened when your present speaker moved as a graduate student from Yale to Harvard? You will, of course, have to judge from my remarks whether this shift of scene was a wise one. In my opinion, however, it was, since I learned at Harvard, from her distinguished biochemist L. J. Henderson, that the greatest scientist this hemisphere has ever produced was a Yale man. This Yale man's name was Willard Gibbs. Curiously enough the first remark which Count Korzybski made at the luncheon given in his honor when he came to New Haven for the Yale Semantics Colloquium was that he was honored to be there because Yale had produced Willard Gibbs.

In saying this he gave expression to the standard used by European thinkers in judging scientists. To the European the outstanding scientist is not the mere fact-finder nor even the experimentist, but the theoretical, mathematical scientist who finds the basic, deductively formulated, axiomatically constructed entities and relations in terms of which the described particulars and the experimental data can be brought together into a system. Democritus and Eudoxus were such scientists in ancient Greece. Newton was such a scientist of the modern world. One has but to read his Principia to see that it is like Euclid's Elements and is, therefore, a deductively formulated scientific theory. Clerk Maxwell did the same thing for electricity, magnetism and optics, bringing them together under a single, deductively formulated set of basic assumptions. Professor Einstein today has a similar rating because, in his special theory of relativity, he reconstructed the theoretical foundations of both mechanics and electromagnetics and, in his general theory of relativity, he based gravitational and mechanical theory on novel, deductively formulated assumptions. Professors Schroedinger and Dirac have done the same thing for contemporary quantum mechanics.

The foregoing scientists did their creative work in Europe. In the late 19th Century Willard Gibbs achieved, for the science of physical chemistry, what the aforementioned European scientists accomplished for mechanics, electromagnetics and quantum theory. This is why L. J. Henderson and European thinkers regarded Gibbs as America's greatest scientist.

One remarkable thing about Gibbs' accomplishments is — the story goes — that he never studied a physical or chemical system more complicated than ice water. His famous phase rule came from an observation and the axiomatic, mathematical formulation of the gaseous, liquid and solid phases of water. He formalized mathematically these phase relationships of any physico-chemical system. He also noted the central importance of the second law of thermodynamics and related his physico-chemical reflections to that cardinal principle. At the same time he inaugurated the shifting of the concept of law in physics from the absolute to the statistical type. So remarkable was the genius of this man that today many contemporary mathematical physicists, such for example as Professor Norbert Wiener, believe that no scientist's ideas have stood the test of time, during the revolutionary changes in scientific theory which have been made in this century, as have those of Willard Gibbs.

The fact that Count Korzybski singled out Willard Gibbs must be significant for a proper understanding of Count Korzybski's semantics. Count Korzybski could hardly have paid such tribute to this great American scientist had he not approved the type of conceptual meanings which Willard Gibbs used. But, if this be true, then the frequent expositions of Count Korzybski's semantics as entailing the clarification of the meaning of any word in terms of the inductively given, concrete images of particulars must be rejected as a false, or at the very least an excessively

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partial, account of his semantics. Certainly to attempt to understand the axiomatically constructed, mathematically formulated, statistical mechanics and physical chemistry of Willard Gibbs in terms of sensed $water_1$, sensed $water_2$, sensed $water_3$, sensed $water_4$, would be ridiculous. Yet it is precisely this which those expositors who talk about Cow_1, Cow_2, Cow_3, etc. have attempted to do with Count Korzybski's semantic theory of conceptual meaning. Were the latter interpretation correct, we would be at a loss to explain the frequent quotations in his books from Gibbs, Newton, Einstein and Poincaré.

This does not mean that there are no concepts whose meanings are exhausted in concrete images or in immediately sensed particulars, after the manner of 'Cow' in the sense of the immediately apprehended image Cow_1, the immediately apprehended image Cow_2, the immediately apprehended image Cow_3, etc. Clearly all concepts in science which refer completely for their meaning to immediately apprehended things must be analyzed in this nominalistic, existential manner to clarify their meanings. Count Korzybski clearly knew that there are such concepts since he was aware of the natural history sciences which describe flowers or birds in terms of their immediately sensed shapes and colors. He also knew that we possess the ordinary words 'yellow,' 'blue,' 'red,' 'green,' etc., where by these words one means the immediately sensed particular images which bear these nominalistic names.

But Count Korzybski's respect for scientists like Gibbs, Newton, Maxwell, Poincaré and Einstein shows also that he was aware of the axiomatically constructed, deductively formulated concepts of mathematical physics which are of a quite different type. Their meanings are obtained in a novel way. They cannot be clarified by reduction to particular images, such as Cow_1, Cow_2, Cow_3, etc.

The problem, therefore, of understanding Count Korzybski's semantics is much more complex than many of his simple-minded expositors have supposed. It requires a clarification of the type of conceptual meaning which appears in mathematical physics as well as of the type of conceptual meaning which is present in the more purely inductive, natural history sciences and in so much of common sense experience.

In order to carry through this enlarged and more complicated clarification of conceptual meanings, the writer has found it necessary to have different names for the two foregoing types of concepts which appear in science and which Count Korzybski's semantics includes. Let us call them concepts by intuition and concepts by postulation.

The type of concept of which the immediately sensed color denoted by the word 'yellow,' and the Cow_1, Cow_2, Cow_3 images are examples, is appropriately called a 'concept by intuition.'[1] A word is a concept by intuition if its entire meaning derives from something that can be immediately apprehended inductively. Since what we apprehend with immediacy inductively is always a concrete particular, succeeded by another perhaps similar, but in some sense different, concrete particular, such concepts, when they are class concepts, are nominalistic rather than real universals. To assert that a concept is a nominalistic universal is to say that the all-ness or universality or commonness of the particulars which the class concept conveys belongs to the symbol and not to the things that are symbolized. What the symbol refers to is a set of successive particular images each one of which is unique; not merely unique in itself but also unique in the sense of being relative to the particular percipient who senses it. Since concepts by intuition refer, therefore, to such unique particulars, their meaning becomes clarified only when the succession of particular, immediately apprehended or apprehendable images is specified.

Since the concepts of mathematical physics are axiomatically constructed in the postulates of a deductively formulated theory, it seems equally appropriate to call them 'concepts by postulation.' A concept by postulation is a concept whose meaning in whole or part is proposed for it by the axiomatically constructed postulates of a specific, deductively formulated theory. 'Red' in the sense of the constant number of a wave length in the deductively formulated theory of electromagnetics of Maxwell is an instance. The concept of electron in the deductively formulated, mathematical electromagnetics of Lorentz is another example. Clearly the meaning of such concepts will be completely missed if one attempts to clarify them in terms of concrete immediately apprehended images. Instead to understand the meaning of any concept by postulation one must turn to the axiomatically constructed postulates and theorems of the deductively formulated theory in which the concept by postulation in question occurs.

I venture to introduce my own terminology, with its concepts by intuition and its concepts by postulation, in the present exposition of Count Korzybski's semantics because at the aforementioned Yale luncheon he turned to me and said that he had made a thorough reading of my LOGIC OF THE SCIENCES AND THE HUMANITIES, in which the aforementioned terminology was expounded, and found himself in complete agreement with it. He added that it was impossible to clarify conceptual meaning without paying attention to epistemology and to the different types of concepts to which the different epistemological ways of knowing give rise.

In order, therefore, to understand his semantics

[1] Northrop, F. S. C., THE LOGIC OF THE SCIENCES AND THE HUMANITIES, MacMillan, New York, 1947, Chapter V.

and the solution of many baffling problems in modern psychological science, philosophy and popular thinking, which it provides, it is necessary to distinguish a concept by intuition from its correlative concept by postulation in a concrete example. Consider a pitcher of ice water. It serves as the instance of a concept by intuition, since we have our immediately apprehended images of it. It also suggested to Gibbs the concepts by postulation of his phase rule and his mathematical physical chemistry. In the sense of the concept by intuition it is a set of sensed particulars. These particulars are its brightness, shininess, its sensed operational heaviness and shape and its sensed coolness and wetness. Each one of these particular sensed images is relative not merely to the perceiver but to particular sense organs of any given perceiver. For example, one cannot feel the shiny brightness of the water and one cannot see its wetness. Furthermore, if one feels the water with a left hand which comes from a solid cake of ice, the water feels warm, whereas if one touches it with a right hand which comes from the ordinary temperature of the room's atmosphere, the water feels cold. Berkeley expressed this relativity of any immediately sensed object or image to percipients and to particular sense organs by saying that, for them to be is to be perceived, esse est percipi. This is the nature of the subject-matter of any concept by intuition.

Were concepts by intuition the only meaningful words which we possess, it follows that there would be no meaning for the ice water being here in the pitcher when no percipient or particular percipient's sense organ has an immediately apprehended image of it. Yet you and I certainly believe that the pitcher and water would be here on the table if no one were present in the room. We believe also that the stars and planets move on in their courses during the night and would continue to do so if everyone were asleep. An analysis of the meaning of words which reduces all meaning to particular images leaves one with a semantics which provides no meaning for these common sense beliefs.

Is it possible to make the common sense belief in external objects semantically meaningful? In the beginning of his Principia, Newton answers in the affirmative. After pointing out that sensed objects and sensed space and time are relative to particular perceivers and to their particular sense organs, he added that there is a space and a time which is the same for all perceivers and which would exist were no one present or no one looking. Public space and time, Newton called mathematical space and time. This was but another way of saying that public space and time are known only by means of the axiomatically constructed concepts by postulation of Euclid's geometry and Newton's Principia.

What do we mean by a scientific object in such a theory? The mathematicians and the mathematical logicians, who know the methods by which the entities of mathematical physics are given their precise scientific meanings, provide us with the answer to this question. For a mathematician or mathematical logician an entity, when considered by itself in isolation, is a bare x. x by itself means any one. But how, then, is the entity x, which is to signify any one electron, to be distinguished from other examples of x? The answer is to be found in the formal properties of the relations within which x functions as a term. To be an electron is to be an entity which can be an x in relations which have the formal properties of the postulates of the electron theory of Lorentz or of his successors. To understand a scientific object which is a concept by postulation in deductively formulated mathematical physics, one must concentrate not on the object but on the formal properties of the relations in which it is a term. To understand the meaning of entities which are concepts by postulation, it is of the essence that one must think relationally.

Note the difference between such entities which are concepts by postulation and entities which are concepts by intuition. Consider immediate sensed 'Cow' as an instance of the latter. To understand the meaning of this word, one needs merely to bring up the successive, particular images. Their relations to one another or to other images are not essential to the grasping of the meaning. In the case of entities, however, which are concepts by postulation, the entity is a meaningless x until the relations which it satisfies are specified. This means that to distinguish one scientific object which is a concept by postulation, from another scientific object which is a concept by postulation, one must have relations with different formal properties for these different entities to satisfy. Where there is no difference in the relations into which entities enter, there is no difference in the entity, if the entity is a concept by postulation.

Consider now the concept by postulation relations. It will be recalled that in the case of 'space,' Newton clearly distinguished concept by intuition space from concept by postulation space. The former, he noted, varies from frame of reference to frame of reference and from perceiver to perceiver and from sense organ to sense organ. Concept by postulation space remains invariant for all perceivers on the same frame of reference and, depending upon the deductively formulated theory in question, for all frames of reference. The latter consideration makes it evident that the meaning for the concept by postulation relations, into which concept by postulation scientific objects enter, cannot be found in the concept by intuition relations that are given through the senses. How, then, do concept by postulation relations take on clear and precise scientific meaning?

The answer is that they find their meaning in the basic concepts of pure mathematics and of mathematical logic — meanings which are not given through the senses inductively but are known intellectually or formally. This is what it means to say that mathematical physics is a formal science and that its entities and relations are axiomatically constructed.

Consider the following elementary example of an axiomatically constructed relation, R. For any x, let it be asserted that the relation R has formal properties such that it is meaningless to affirm that R relates any one x to that x itself. Expressed in the symbolism of mathematical logic, this gives:

Postulate I. $(x). \sim (x\ R\ x)$

where (x) means for all x, and ~ means not.

Postulate I asserts that R is an inreflexive relation. A relation is inreflexive when it does not hold between any entity and that entity itself.

Let Postulate II assert that for any x, if x R y, then ~ y R x. Expressed in the symbolism of mathematical logic, this gives:

II. $(x, y) : (x\ R\ y)$ and $\sim (y\ R\ x)$

Postulate II asserts that the relation R is an insymmetrical relation. A relation is insymmetrical if, holding between x and y, it does not hold between y and x.

Let Postulate III assert for any entities, x, y, z, that if R holds between x and y and R holds between y and z, then R holds between x and z. Expressed in the symbolism of mathematical logic, this gives:

$$(x\ y\ z) :. (x\ R\ y) . (y\ R\ z) : \supset : (x\ R\ z),$$

where ⊃ means implies.

Postulate III asserts that R is a transitive relation. A relation R is transitive if, holding between x and y and between y and z it also holds between x and z.

What scientific properties does the relation R, as axiomatically constructed by the three foregoing postulates, give any entity x, y or z of R? The answer is unequivocal and may be put concretely as follows: Consider a group of bare entities having no specified relations to one another. What happens to these entities when they become terms in an axiomatically constructed relation which has the formal properties of Postulates I, II and III above? The entities become ordered in a series. Postulates I, II, and III, therefore, define a serial relation. They also have the effect of turning any entities of such a relation into serially ordered entities.

By making the formal properties of R more and more complex, the properties of any scientific objects which have R as their relation to one another become more and more complex and restricted. In this way, scientific objects of any degree of complexity can be constructed.

It is to be noted that nowhere in their scientific meaning is any appeal made to immediately sensed objects, relations or images. It is by this means that man is able to arrive at the concept of an object which exists independently of sensed images which are relative to perceivers. It was by this means also that Newton provided meaning for a public world, the same for all perceivers. Einstein follows Newton in this regard.

The three postulates above are preceded by entity variables in parentheses. These entity variables in their parentheses are called, by mathematical logicians, universally quantified entities. This amounts to the assertion that the relation R holds not for some of these entities, but for all of them. This means that to be a scientific object in axiomatically constructed mathematical physics is to be an instance of a universal relation or law. Such entities are real, rather than nominalistic, universals. They are not unique particulars since the sole scientific meaning which they possess is a meaning prescribed by being an entity in a universal relation or law. Their theoretical scientific properties have nothing to do, therefore, with inductively sensed images, nor with unique particulars.

Let it be remembered, however, that there are the entities and relations denoted by concepts by intuition whose meanings are made explicit only in terms of particular images or sensed entities. The problem, therefore, of fully clarifying Count Korzybski's semantics, with its inductive concepts of common sense experience and its theoretic concepts of mathematical physics, becomes that of specifying the relation between the entities and relations denoted by concepts by intuition, which do analyze into nominalistic, existential particulars, and the entities and relations designated by concepts by postulation which do not find their meaning in particular images or particular sensed relations.

One very frequent confusion must be avoided. This confusion consists in supposing that the relatedness of axiomatically constructed scientific objects is the relatedness of inductively given, concept by intuition, sensed relations. For this to be true, the relatedness, for example, of sensed objects in sensed space and time would have to be identical, or isomorphic, with the relatedness of axiomatically constructed scientific objects in mathematical space and time. Newton has already pointed out to us that this is not the case. The relatedness of sensed space is fuzzy. It is one thing with one's glasses on; it is another thing with one's glasses off. It is blurred and distorted before breakfast, immediately after one arises in the morning; it becomes sharper after breakfast and one or two cups of coffee. Sensed space, furthermore, does not extend beyond the limited, local reach of our senses. The relatedness of the space of mathematical physics is, in contemporary scientific theory, infinitely extended and in Newton's mechanics, Maxwell's electromagnetics, Gibbs' physical chemistry and Einstein's special theory of relativity, it has the same Euclidean mathematical properties everywhere and always. This makes it clear, therefore, that one cannot identify the relatedness between scientific objects of mathematical physics with the sensed relations of sensed objects of inductive natural history science or of common sense awareness. In short, the concept by intuition relations are not to be confused with concept by postulation relations.

What then is the relation between the axiomatically constructed relatedness of the scientific objects of deductively formulated mathematical physics and the relativistic sensed relatedness of sensed objects in natural history science and ordinary common sense awareness? To clarify this point is to get to the heart of Count Korzybski's criticism of Aristotelian thinking.

According to Aristotelian thinking, sensed objects are related to the scientific objects of mathematical physics by the two-termed relation of predication. In Aristotle's physics, for example, the chemical and physical element, 'water,' was defined as anything which has the sensed predicates wet and cold. Galilei had no difficulty in showing that such an object is not a real object in the sense of being an entity that exists independently of its relation to the perceiver. He demonstrated this, as we have done previously, by pointing out that if one's hand comes to the water in the pitcher from the atmosphere of the room at ordinary room temperature, then to that hand, coldness and hence water is present, whereas, if one's hand comes to the water in the pitcher from a cake of ice, then the substance in the pitcher is not water, since what one senses is hot rather than cold. This was the major consideration which led Galilei, and Newton following him, to reject sensed qualities as the predicates which define chemical and physical objects.

The latter conclusion led many thinkers, among whom were Descartes, probably Newton, Locke and others, to conclude that the scientific objects which are independent of the senses possess some predicates which are given through the senses such as impenetrability and shape, but do not possess some other sensed predicates such as coolness, hotness, redness, yellowness, fragrance, etc. In short, the distinction was drawn between sensed primary qualities which were supposed to be intrinsic predicates of objects existing independent of their relation to the perceiver and sensed secondary qualities which were not predicates of the object but depended on a particular perceiver for their existence.

Immediately the question arose: Of what, then, are the secondary qualities the predicates? Note how the Aristotelian theory that sensed entities are related to scientific objects by the two-termed relation by predication is being <u>unconsciously assumed.</u> Having made this assumption, but one answer was possible. Since the hotness and coldness, colors, sounds, flavors and fragrances are not predicates of the scientific objects, there must be some other entities or substances of which they are the predicates. It was natural to identify the latter substances with the minds that are conscious of these secondary qualities. Thus there arose the basic, dualistic, metaphysical scientific and philosophical theory of early modern psychologists, physiologists and philosophers — the theory, namely, that reality is to be conceived of as a set of material substances with their primary qualities of impenetrability and shape and a set of immaterial, mental substances with their faculty of consciousness and their capacity to know hotness and coldness, colors, sounds, wants and flavors as appearances.

This is a typical instance of what Count Korzybski meant by Aristotelian thinking. Note how the thesis that sensed objects are related to scientific objects by the two-termed relation of predication, drives one unequivocally to this mental substance-material substance dualism. Note also how the rules of Western grammar force one into this way of thinking unless one is most careful. Western grammar requires that no indicative sentence is to be permitted unless its subject has a predicate. This again is Aristotelian thinking. The table <u>is</u> red; the water <u>is</u> cold; the atmosphere <u>is</u> hot.

It soon became evident, however, to people who affirmed the mental substance-material substance theory that the theory is untenable. The untenability appears in psychology and in the physiology of the brain when one asks where the material substances of the body or the brain contact the mental substance which is the mind with its private secondary qualities. A material substance is, by its scientific definition, an entity of the relatedness which is axiomatically constructed mathematical space. It is by its scientific character such, therefore, that it can only act in space. Mental substances, however, are not in space. Instead, for them, space is the relatedness of the entities within their internal, private consciousness. To realize this is to be forced to the conclusion, therefore, that it is meaningless to talk about a material substance affecting a mental substance. Clearly a substance which can only act within space cannot contact a substance which is not in space. The theory, therefore, of the interaction between mind and body, conceived as mental and material substances, becomes untenable. And, with this, the whole Aristotelian theory that sensed entities in sensed space and time are related to scientific objects in scientific space and time by the two-termed relation of predication becomes untenable also. This is the heart of what Count Korzybski was maintaining, quite correctly, when he attacked Aristotelian thinking and the pseudo-problems which its implicit presence in our ordinary language creates for us.

How is the error of this way of thinking to be overcome? The answer should already be clear. The scientific objects of mathematical physics are not defined in terms of any sensed predicates whatever, neither the sensed predicates of shape and impenetrability of the so-called primary qualities, nor the sensed predicates of coolness, hotness, yellowness, etc., of the so-called secondary qualities. The objects of mathematical physics are not sensed in any way. Instead they are axiomatically constructed entities satisfying the specific formal properties of the axiomatically constructed relations as prescribed by the postulates of a specific, deductively formulated theory.

One thing about such entities has already been noted in our third postulate. The relations joining them need not be two-termed relations. Hence, the attempt to reduce all relational meaning to the two-termed relation of predication is impossible. The relations of mathematical physics can relate one, two, three or an infinite number of entities. They can relate, moreover, an infinite number of entities in different senses of the word infinite. The infinite can be countable, after the manner of the series of natural numbers, or the infinite can be Dedekindian. But to think this way is to give up the Aristotelian mode of thinking.

We have not yet, however, fully solved our basic problem. This problem, let it be recalled, was: What is the relation between the sensed images in inductively sensed space and time, and the axiomatically constructed, scientific objects in their axiomatically constructed spacial and temporal relatedness?

One answer to this question has already been established. The relation between the concept by intuition relatedness of sensed entities and the concept by postulation relatedness of the scientific objects of mathematical physics is not that of identity. Otherwise the relatedness of the sensed objects would be the same as the relatedness of mathematical physics. We have seen also that the relation is not that of predication, as Aristotle affirmed and as ordinary grammatical thinking tends to make one believe.

The specification of this relation is yet to be thoroughly worked out. This is the basic problem of the contemporary philosophy of science and of human knowledge in general. The outlines of the positive answer are, however, clear. First, thinking in terms of many-termed relations is essential. This is what Count Korzybski meant by non-Aristotelian thinking. Second, the concept by intuition sensed objects and the concept by intuition sensed relatedness must be one factor within the many-termed relational system in which the concept by postulation scientific objects and their concept by postulation relatedness is another, perhaps, more all-embracing factor.

This is what Whitehead meant when he said that sensed objects ingress into nature in many-termed relations. This was but another way of stating what Count Korzybski meant when he asserted that Aristotelian thinking is the cause of contemporary difficulties and that non-Aristotelian thinking is required. It was the mathematical physicists, such as Newton, Maxwell, Willard Gibbs and Einstein and the mathematical logicians who gave positive conceptual meaning to what Korzybski meant by non-Aristotelian thinking.

These considerations suggest that the inductively given world with its sensed entities and relations, denoted by concepts by intuition which analyze into nominalistic particular images, is part of a larger, relational system of which another part is the axiomatically constructed factor with its concepts by postulation which must be analyzed in terms of the formal properties of many-termed relations. Can the relation joining the one part to the other part of this all-embracing relatedness be specified more positively? The contemporary mathematical physicist, Professor Henry Margenau, and I have indicated that it can. The positive relation is to be found in the method of mathematical physics itself. This method, in its postulates, designates axiomatically constructed, unobservable scientific objects and relations. As such alone, the method of mathematical physics gives merely a possible world; it does not denote an experimentally verified, actual world. Yet the theories of mathematical physics are experimentally verified theories. In experiment, one is confronted not merely with the axiomatically designated entities and relations that are being put to a test, but also with directly sensed objects and their directly sensed relations. This means that the method of mathematical physics, when examined in its entirety, must contain within itself the positive relation that joins the directly sensed portion to the theoretically designated portion of its complete relatedness.

Analysis of the method of mathematical physics reveals this positive relation. It is a two-termed relation which is not always a one-one two-termed relation. It is not, however, the two-termed relation of predication of Aristotelian thinking. Professor Margenau has called these positive two-termed relations 'correspondences'; the writer calls them 'epistemic correlations,' indicating that they join factors known in two different ways.[2]

It remains, however, to specify the single, all-embracing, many-termed relation, including the epistemic correlations or correspondences, which brings the concept by intuition entities and relations and the concept by postulation entities and relations into a single relational system. It is this which in part the unitary field theory of physics of Einstein and Heisenberg are attempting to obtain. Such theories

[2]Northrop, op. cit., Chapter VII and Margenau, Henry, THE NATURE OF PHYSICAL REALITY, McGraw-Hill Book Co., New York, 1950.

would still fail, however, to include sensed entities and sensed space and time. It is the inclusion of the latter as well as the former which Whitehead's philosophy of science and metaphysics has attempted to specify.[3] The writer believes there is a third way by which this can be done.[4]

To make this or another solution tenable, it remains to specify what is meant in science when one says that an axiomatically constructed scientific object, such as an electron, a gene, or a proton molecule, exists. Clearly an adequate theory of semantics must provide such a meaning of existence. I can merely hint at the answer. There is evidence which suggests that it is to be found in a concept by intuition factor which William James noted in his radically empirical investigation of immediate experience and which the Oriental Buddhists and Hindus discovered long before him. Should this turn out to be the case, not only will aesthetically immediate and colorful sensuous nature come into harmony with abstract mathematically conceived nature, but also emotive, immediately felt man will be made one with axiomatically known theoretically conceived man. In other words, human beings, due to a bad semantics and to over-simplified theories of conceptual meaning and of epistemological ways of knowing, will not remain repressed or schizophrenic as so many, if not most, of us, are at present. Then Count Korzybski's second insight will be near actualization. One will have science with sanity.[5]

These are some of the considerations which make the man whom we honor tonight important. In any event we can be sure that he was correct when he insisted that words must be watched with respect to the sources of their meanings, that non-Aristotelian rather than Aristotelian thinking is required and that when non-Aristotelian or, in other words, many-termed relational thinking, is taken seriously, both human beings and science can become more sane.

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Robert K. Straus: I want to thank Professor Northrop for this very quick and comprehensive trip that we have taken here and that I, for one, have been trying to assimilate and also for his understanding of Korzybski's work and his placing of it in the environment of his own work. I would like to use the privilege of the chair and ask Professor Northrop if he would elucidate a little more the relation between Western and Eastern culture, since this relation deals directly with the level of immediate and aesthetic apprehension. Is this a fair question?

Northrop: Yes. It cuts to the heart of the relation between the concept by intuition and the concept by postulation factors. My main thesis in THE MEETING OF EAST AND WEST was that the Orient mastered the concept by intuition mode of knowing with its emphasis upon the silent level in knowledge and upon intuition. This gave great emotive content and aesthetic sensitivity. The second thesis of the aforementioned book was that the concept by postulation, axiomatic way of knowing was discovered first by the Greek mathematical physicists who preceded Eudoxus, Plato and Aristotle. It may be added that Platonic and Aristotelian ideas were not the 'pie in the sky,' vacuous abstractions that they have been portrayed as being by many philosophers. Plato always and Aristotle in his astronomy were talking about the technical ideas of mathematics and physics. Over the door of Plato's Academy were the words: 'Only geometricians need enter here.' Geometry in his Academy was an axiomatically constructed science. This means that one can't understand Plato's philosophy unless one understands axiomatically constructed relational thinking.

Now, in answer to your question, I believe that the error the West made or tended to make, is that, being so fascinated with the relatedness which is different from the sensed relatedness, it tended to push the sensed relatedness aside either as mere appearance or, following Aristotle's terrestrial physics, to turn it into the two-termed predicate of a substance. The treating of concept by intuition sensed particulars and their sensed relatedness as appearance tended to leave Western man emotively, aesthetically and spiritually starved. The Aristotelian way of treating aesthetic qualities as predicates of natural substances provided meaning for classical Western art but tended to blind Western man to what Whitehead has termed the 'vagrant' sensed objects of experience, which cannot be fastened as predicates to external objects and thus tended also to make Western man emotively and aesthetically insensitive to the full aesthetic richness of impressionistic immediacy. Modern impressionistic art and recent philosophic existentialism are the reactions to this inadequacy. Put in religious terms this means that the West has tended to obtain the intellectual love of God, to use Spinoza's terms, but has missed the existential intuitive love of God of Asian Buddhism and Hinduism.

This is where the concrete image type of analysis in Count Korzybski's semantics is tremendously important. It brings us back to aesthetic immediacy, to the concrete, blurred and vagrant particular images

[3] Whitehead, Alfred North, PROCESS AND REALITY, Macmillan, New York, 1929, and THE CONCEPT OF NATURE, Cambridge University Press, 1920.

[4] Northrop, F. S. C., THE MEETING OF EAST AND WEST, Macmillan, New York, 1946, p. 453.

[5] Korzybski, Alfred, SCIENCE AND SANITY: AN INTRODUCTION TO NON-ARISTOTELIAN SYSTEMS AND GENERAL SEMANTICS, 1933. 3rd Edition, 1948, Institute of General Semantics, Lakeville, Connecticut, Distributors.

and to what he so appropriately termed 'the silent level.' At this point his thinking touched the silence of the Oriental Buddhist's intuition and the Hindu's ineffable immediacy when he becomes one with Brahman.

It must be added also that the concrete, existential, intuitive factor in knowledge must always be thought of as an all-embracing continuum. We never merely see a yellow color here. We see it in the whole, expansive manifold. That manifold, moreover, is really an ineffable thing which can't be said. In fact, anything which one immediately senses, one cannot say. One cannot convey what the concept by intuition word 'green' means to me, since, being color blind with respect to green, I have never experienced it. Nor will any axiomatically constructed relation or formula convey to me what you mean by immediately sensed green. In the case, therefore, of any object or relation known with immediacy one has to experience what is meant before the symbol can become meaningful. If one hasn't had the experience, then words cannot convey it.

It is this silent level of knowledge, the immediate portion of our being and of all things, that we in our Western culture have tended to lose or to dismiss as of secondary importance. At this point we can learn from our impressionistic painters, from existential philosophers and from the Orient.

Curiously enough, however, in our present education we are equally deficient with respect to the way of knowing in which Western civilization is unique and most proficient. Notwithstanding the fact that we are living in a society which derives, in its law of contract and in its technology, from the axiomatically constructed way of knowing, only a few people who pass through our educational system, even at the university and graduate school levels, learn how to think in terms of axiomatically constructed entities and relations. Relational thinking is foreign to the mentality of most people.

The fact is that contemporary education does not fit men and women either to appreciate aesthetic immediacy or to understand the axiomatically constructed, more theoretical and relational component of our civilization. Instead contemporary pedagogy so confuses concept by intuition immediacy with concept by postulation theoretically grasped knowledge that both are corrupted and that neither the Orient nor the West is truly and deeply understood.

To remove this tragic error, our elementary education and all further education grounded upon it should consist of two primary things: (1) Impressionistic art to give the silent level, to give one intuitive, aesthetic sensitivity and to provide one with the equanimity of silence of the Buddha and of Brahman which is the spirit of Asia. (2) The logic of relations. Without the latter, one cannot understand either Western mathematical physics or the norms and values that give what is unique and most precious in Western civilization.

Put very concretely such an education would mean that one would start children when they are very young with impressionistic painting and train them to note the unique character of each particular image, noting that no two sensed sunsets are ever identical. That 'the same cow' is never identical in any two images of it. Let them know at the silent level without making inferences to tables and chairs with predicates fastened to them or to spherical moons or planets moving in orbits according to the laws of mechanics.

Having thus become sensitive to immediacy in all its all-embracing manifoldness and vagrant differentiated complexity, let them then turn to the understanding of axiomatically constructed order. Let them, for example, in the earliest grades of school grasp the three postulates that define a serial relation, noting that mathematics and mathematical physics are but a more complicated articulation of this way of thinking and knowing.

With these two emotively and aesthetically rich and formally and intellectually powerful ways of knowing, conceptualizing, feeling and thinking, students coming out of the elementary grades will have the instruments and materials necessary for understanding any department of human knowledge and for appreciating all cultures including their own.

[Reprints of Dr. Northrop's lecture are available at 35¢ each. In lots of ten or more at 25¢ each.]