PERCEPTION

—

AN APPROACH TO PERSONALITY

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CHAPTER 7

THE ROLE OF LANGUAGE IN THE PERCEPTUAL PROCESSES

By Alfred Korzybski [1]

It is my particular privilege, as I am not a specialist in the field of psycho-logics,[2] to participate in this symposium dealing with such a vital subject. The topic and main divisions of this Chapter were suggested to me by the organizers of the symposium, and I am glad to abide by them.

In my work I have found that there are some simple principles underlying the subject matter which I will attempt to convey here. More details may be found in the bibliography given, and the large amounts of other related literature available.

Not dealing with the problem of "perception" directly in my work, I shall use this term here in the vernacular sense. I do not consider myself qualified to define it, and so shall use quotation marks to indicate my nontechnical treatment of this type of human reactions. I cannot avoid dealing with the problems of "perception" indirectly but will do so from a different angle.

The Effect on Perceptual Processes of the Language System

Perhaps a story from the European underground under Hitler would be a good illustration. In a railroad compartment an American grandmother with her young and attractive granddaughter, a Romanian officer, and a Nazi officer were the only occupants. The train was passing through a dark tunnel, and all that was heard was

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[1] Alfred Korzybski died on March 1, 1950, while doing the final editing of this paper. Miss Charlotte Schuchardt, his editorial secretary, in a letter made the following statement regarding the final form of the manuscript: "It should be stated that he did not complete the final editing of this paper. The editing which I did after his death was minor, and I am grateful for the assistance of some members of the Institute staff. Yet I must assume the responsibility both for the slight editing, and also, particularly, for not making editorial changes which he might have made."

[2] On the special uses of hyphens and other printed symbols as "extensional devices" in this chapter, see pages 192-93.

a loud kiss and a vigorous slap. After the train emerged from the tunnel, nobody spoke, but the grandmother was saying to herself, "What a fine girl I have raised. She will take care of herself. I am proud of her." The granddaughter was saying to herself, "Well, grandmother is old enough not to mind a little kiss. Besides, the fellows are nice. I am surprised what a hard wallop grandmother has." The Nazi officer was meditating, "How clever those Romanians are! They steal a kiss and have the other fellow slapped." The Romanian officer was chuckling to himself, "How smart I am! I kissed my own hand and slapped the Nazi."

Obviously it was a problem of limited "perception," where mainly "hearing" was involved, with different interpretations.

Another example of "perception" could be given which anyone can try for himself. In fact, I suggest that this simple demonstration should be repeated by all readers of this paper. The demonstration takes two persons. One, without the knowledge of the other, cuts out large headlines of the same size from different issues of a newspaper. The subject remains seated in the same position throughout. He is shown one of the headlines at a certain distance. If he is able to read it, it is discarded. Then he is shown another, different, headline at a somewhat farther distance away. Again, if he is able to read it, it is discarded. This process is repeated until the subject is unable to read the headline. Then the demonstrator tells him what is in the headline. The amazing fact is that the subject will then be able to *see and read* the headline the moment he "knows" what is there.

Such illustrations could be multiplied indefinitely. These examples are enough to illustrate the impossibility of separating sharply the "perceptual," "seeing," "hearing," etc., and "knowing," a division which cannot be made, except superficially on verbal levels.

In a non-Aristotelian orientation we take for granted that all "perceptual processes" involve abstracting by our nervous system at different levels of complexity. Neurological evidence shows the selective character of the organism's responses to total situations, and the papers in this symposium also corroborate the view that the mechanisms of "perception" lie in the ability of our nervous system to abstract and to project.

Abstracting by necessity involves evaluating, whether conscious or not, and so the process of abstracting may be considered as a *process of evaluating stimuli,* whether it be a "toothache," "an attack of migraine," or the reading of a "philosophical treatise." A great many factors enter into "perceiving," as suggested by the content

of this symposium. As this seems to be a circular process, it is considered here on lower and higher levels of complexity (see page 200).

Processes of Abstracting.—Our knowledge today indicates that all life is electro-colloidal in character, the functioning of the nervous system included. We do not as yet know the intrinsic mechanisms, but from an electro-colloidal point of view every part of the brain is connected with every other part and with our nervous system as a whole. With such a foundation, even though it becomes necessary to investigate different aspects of the processes of abstracting for purposes of analysis, we should be aware that these different aspects are parts of one whole continuous process of normal human life.

Let us consider what our nervous system does when we "perceive" a happening or event. The term "event" is used here in the sense of Whitehead as an instantaneous cross-section of a process. Say we drop a box of matches. Here we have a first-order happening, which occurs on *nonverbal* or what are called the "silent" or "un-speakable" levels. The reflected light impinges on the eye, we get some sort of electro-colloidal configurations in the brain; then, since we are sentient organisms, we can react to those configurations with some sort of "feelings," some evaluations, etc., about them, on "silent" levels. Finally, on the verbal levels, we can speak about those organismal reactions. Newton may have said, about the falling matchbox, "gravitation"; Einstein may say "space-time curvature." Whatever we may *say* about it, the first-order happening remains on the silent levels. How we will *talk* about it may differ from day to day, or from year to year, or century to century. All our "feelings," "thinkings," our "loves," "hates," etc., *happen* on silent un-speakable levels, but may be affected by the verbal levels by a continuing interplay. We may verbalize about them, to ourselves or others, intensify, decrease them, etc., but this is a different problem.

In the following diagram (Figure 35) is given an extensional analysis of the process of abstracting from an electro-colloidal non-Aristotelian point of view. It is oversimplified and could be made more exhaustive. However, it is satisfactory for our purpose of explaining briefly the most general and important points.

Most of us *identify in value* levels I, II, III, and IV and react *as if* our verbalizations *about* the first three levels were "it" (see page 183 ff.). Whatever we may *say* something "is" obviously *is not* the "something" on the silent levels. Indeed, as Wittgenstein wrote, "What *can* be shown, *cannot* be said." In my experience I found that it is practically impossible to convey the differentiation of silent (un-speakable) levels from verbal levels without having the hearer
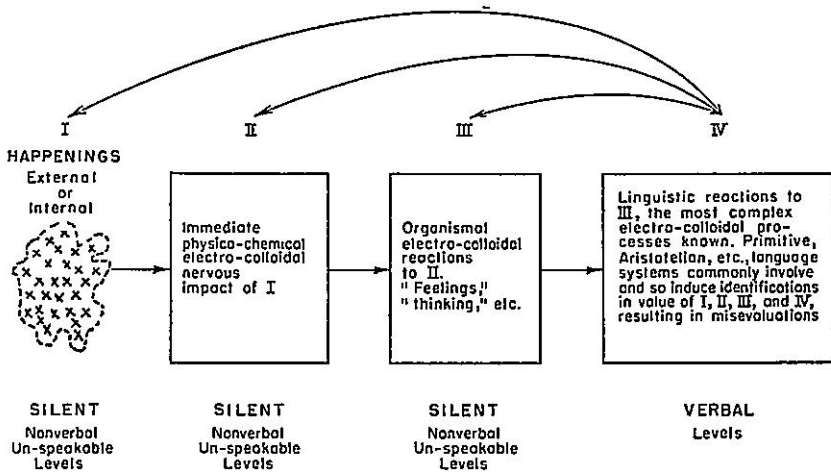
FIG. 35.—The process of abstracting from an electro-colloidal non-Aristotelian point of view.

or reader pinch with one hand the finger of the other hand. He would then realize organismally that the first-order psycho-logical direct experiences are not verbal. The simplicity of this statement is misleading unless we become aware of its implications, as in our living reactions most of us identify in value the entirely *different* levels, with often disastrous consequences.

Unfortunately, people in general, including many scientists, *disregard levels II and III completely,* and react as if unconscious that IV "is not" I. In other words, we do not take into account the mechanisms of the human nervous system or "think electro-colloidally" about our reactions. Such a disregard leads to misunderstandings, heated two-valued ("either-or") debates, hostilities, prejudices, bitterness, etc. In the history of "philosophy," for example, the metaphysical fight about "solipsism" simply ceases to be a problem when we become conscious that the only possible link between the inherently different silent (nonverbal) and verbal levels is found in their similarity of structure, expressed in terms of relations, on which the present non-Aristotelian system is based.

An awareness of the processes of abstracting clarifies the *structure* of a great many of our interpersonal, professional, etc., difficulties, which may become trivial or nonexistent if we become conscious of the identifications involved. Self-made problems often turn out to be no problems.

Statements are verbal; they are never the silent "it." One may have a nightmare that he "is" a Stalin. That may be innocent enough. One may have daydreams of being a Stalin. That is more serious.

One may proclaim consciously, "I am Stalin," and *believe in it,* and begin to shoot people who disagree with him; usually such a person is locked up in a hospital, and he usually is a hopeless case.

We see how the above diagram indicates human semantic (evaluational) mechanisms in the average individual who is hovering between sanity and semantic illness. It is well known that what would be only a dream to a "normal" person, "is reality" to a dementia praecox patient, who lives and acts accordingly.

These mechanisms also function pathologically in infantile adults, who live in a fictitious world built up on identifications.

The verbal levels, in the meantime, are of unique human importance because we can abstract on higher and higher verbal levels from I, II, III, etc. In human life, IV represents means for intercommunicating and transmitting from individual to individual and generation to generation the accumulated experiences of individuals and the race. I call this human capacity the "time-binding" characteristic.

The symbolic levels of behavior differentiate most sharply *human* reactions from signal reactions of lower, less complex forms of life. If those accumulated experiences are not properly verbalized, it may seriously twist or even arrest human development.

This simple diagram represents most complex processes, involving "perception" on different levels, problems of interpretation, verbal formalism, etc. Every type of human reactions from the lowest to the highest levels involves these mechanisms, the nonawareness of which may lead to disturbing, frustrating, or disastrous mis-evaluations and consequences. We will find later how this diagram applies to primitive and Aristotelian language structures.

I have stressed the serious or tragic aspect of our processes of abstracting here because I am attempting to convey the heavy life-value of what may otherwise appear too simple and obvious.

Verbal and Nonverbal "Thinking."—It will be noticed that I have put quotation marks around the word "thinking." This term usually implies a more "cortical" activity, indicating verbally some sort of a split between the functioning of the cortical and thalamic *regions* of our nervous system where there is actually no such split, but an interaction and integration on different levels.

"Is all thinking verbal?" Some say "yes," some say "no." If, however, we limit ourselves to verbal "thinking," we are caught in our old linguistic ruts of bygone generations, socio-culturally trained and neurologically canalized in the inherited forms of representation. Under such conditions we are unable or unfit to see the outside or

inside world anew, and so we handicap scientific and other creative work. We speak so glibly about "freedom," never considering Willard Gibbs' *degrees of freedom* on which all our advance depends. A non-Aristotelian system involves that new orientation which ultimately leads to creative "thinking." Thus, an automobile has indefinitely more degrees of freedom than a street-car, which is "canalized" in its rails. Unfortunately and perhaps tragically, the majority of us "think" verbally, so characteristic of the Aristotelian subject-predicate orientation, and thus are handicapped in or prevented from creative "thinking." The physico-mathematical and so scientific way of "thinking" broke through those handicaps, and thus is at the foundation of creative scientific work, which brings to mankind so many benefits.

There is a tremendous difference between "thinking" in verbal terms, and "contemplating," inwardly silent, on nonverbal levels, and then searching for the proper structure of language to fit the supposedly discovered structure of the silent processes that modern science tries to find. If we "think" *verbally*, we act as biased observers and project onto the silent levels the structure of the language we use, so remaining in our rut of old orientations which make keen, unbiased observations ("perceptions"?) and creative work well-nigh impossible. In contrast, when we "think" without words, or in pictures or visualizations (which involve structure and, therefore, relations), we may discover new aspects and relations on silent levels, and so may formulate important theoretical results in the general search for a similarity of structure between the two levels, silent and verbal. Practically all important advances are made in that way.

Jacques Hadamard, the great mathematician, has made a study of how some outstanding mathematicians and scientists "think." I refer to his valuable little book on *The Psychology of Invention in the Mathematical Field* (11). The majority of these creative men reported that they "think" in terms of visual structures. "Most generally images are used, very often of a geometrical nature," he found (11, p. 114). I may mention here one of the questions which Hadamard asked in his questionnaire, to which Einstein gave an answer of particular interest to us here:

Question: It would be very helpful for the purpose of psychological investigation to know what internal or mental images, what kind of "internal word" mathematicians make use of; whether they are motor [kinesthetic], auditory, visual or mixed, depending on the subject which they are studying (11, p. 140).

Answer: The above mentioned elements are, in my case, of visual and some of muscular type. Conventional words or other signs have to be sought for laboriously only in a secondary stage, when the mentioned associative play is

sufficiently established and can be reproduced at will. . . . In a stage when words intervene at all, they are, in my case, purely auditive, but they interfere only in a secondary stage as already mentioned (11, p. 143).[3]

Personally, I "think" in terms of pictures, and how I *speak* about those visualizations later is a different problem. I also notice a severe strain on my eyes when doing creative work, due to that visualizing, which seems to be related somehow to "perception."

In this connection I may refer also to a most important essay on "Mathematical Creation" by the great mathematician, Henri Poincaré (34), which was delivered in the first years of this century as a lecture before the Psychological Society in Paris.

Language becomes then a *medium* through which we eventually talk to ourselves or to others, with its own definite limitations. "The relation between language and experience is often misunderstood," Sapir found (40). "Language is not merely a more or less systematic inventory of the various items of experience which seem relevant to the individual, as is so often naïvely assumed, but is also a self-contained, creative symbolic organization, which not only refers to experience largely acquired without its help, but actually *defines experience for us* by reason of its formal completeness and because of our unconscious projection of its implicit expectations into the field of experience" (italics mine).

As Santayana said, "The empiricist . . . thinks he believes only what he sees, but he is much better at believing than at seeing" (21, p. 1).[4]

In *An Essay on Man*, Ernst Cassirer (7) discusses the "hunger for names" which every normal child shows at a certain age.

By learning to name things a child does not simply add a list of artificial signs to his previous knowledge of ready-made empirical objects. He learns rather to form the concepts of those objects, to come to terms with the objective world. Henceforth the child stands on firmer ground. His vague, uncertain, fluctuating perceptions and his dim feelings begin to assume a new shape. They may be said to crystallize around the name as a fixed center, a focus of thought.

But herein lies an important aspect of "naming" or "labeling":

The very act of denomination depends on a process of classification . . . they [the classifications] are based on certain constant and recurring elements

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[3] By permission of Princeton University Press.
[4] Arabic-numbered page references to Korzybski's *Science and Sanity* are correct for all editions. References in Roman numerals are to the third edition; for corresponding pages in the second edition, subtract five.

in our sense experience. . . . There is no rigid and pre-established scheme according to which our divisions and subdivisions might once for all be made. Even in languages closely akin and agreeing in their general structure we do not find identical names. As Humboldt pointed out, the Greek and Latin terms for the moon, although they refer to the same object, do not express the same intention or concept. The Greek term (*mēn*) denotes the function of the moon to "measure" time; the Latin term (*luna, luc-na*) denotes the moon's lucidity or brightness. . . . The function of a name is always limited to emphasizing a particular aspect of a thing, and it is precisely this restriction and limitation upon which the value of the name depends. . . . in the act of denomination we select, out of the multiplicity and diffusion in our sense data, certain fixed centers of perception (7).[5]

A "name" (label) involves for a given individual a whole constellation or configuration of labeling, defining, evaluating, etc., unique for each individual, according to his socio-cultural, linguistic environment and his heredity, connected with his wishes, interests, needs, etc.

Cassirer makes some interesting comparisons between a child learning its first language and an adult learning a foreign language. I may add here that it happens that I was born into four languages (three different roots), and this has helped me not to be bound by words as I might have been if I had learned only one language as a child.

We see the seriousness of terminology, which is affected by *and also determines* our general *Weltanschauung*. In 1950 we must visualize the world in general as a submicroscopic, dynamic electronic process and life in particular as an electro-colloidal process of still much higher complexity (1, 2). What has made it possible for us to visualize an "object" and life in this way? Theories, verbalizations, built up for thousands of years, up to the latest discoveries of modern science. Thus, we find again that ceaseless circularity (see pages 200 ff.). The fact that we can "perceive" happenings, objects, or persons in this way has very important bearings on that whole process, as we will find later in our discussion.

Primitive Language Structures.—All languages have a structure of some kind, and every language reflects in its own structure that of the world as assumed by those who evolved the language.[6] Reciprocally, we read mostly unconsciously into the world the structure of the language we use. Because we take the structure of our own habitual language so much for granted, particularly if we were born

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[5] By permission of Yale University Press and Mrs. Toni Cassirer.
[6] For the research supporting this theory, see Korzybski's *Science and Sanity*.

into it, it is sometimes difficult to realize how differently people with other language structures view the world.

The *structure* of anything, whether it be a language, house, machine, etc., must be in terms of *relations*. To have "structure" we must have a complex or network of ordered and interrelated parts. The only possible link between the nonverbal and verbal levels is found in terms of relations; and, therefore, relations as factors of structure give the sole content of all human knowledge. Thus, we may realize the importance of the structure of a language, any language. Bertrand Russell and Ludwig Wittgenstein were the important pioneers in devoting serious attention to the problem of structure (38, 39, 51). I cannot go into this problem in more detail here, except to try to convey its fundamental importance.

Among primitive peoples with one-valued "pre-logical thinking" the "consciousness of abstracting" is practically nil. The effect upon an individual produced by something inside his skin is projected outside his skin, often acquiring a demonic character. The "idea" of an action or object is identified with the action or the object itself.

The "paralogical" state is a little more advanced. Here the identifications are based on *similarities,* and differences are neglected (not consciously, of course). Lévy-Bruhl describes this primitive evaluational level by formulating the "law of participation," by which all things which have *similar* characteristics *"are the same"* (29; 21, p. 514). A primitive "syllogism" runs somewhat as follows: "Certain Indians run fast, stags run fast; therefore, some Indians *are* stags." This evaluational process is entirely natural at this level and lays a foundation for the *building of language* and higher order abstractions. We proceeded by similarities, much too often considered as identities.

Primitive men do not discuss abstract "ideas." As Boas has found, "The Indian will not speak of goodness as such, although he may very well speak of the goodness of a person. He will not speak of a state of bliss apart from the person who is in such a state." However, Boas concludes, "The fact that generalized forms of expression are not used does not prove inability to form them, but it merely proves that the mode of life of the people is such that they are not required" (3, pp. 64-67).

The use of abstract terms, such as a term for "goodness as such," made possible an enormous economy in communication, also a great increase in human time-binding progress, and ultimately it made modern science possible. In the meantime, the fact that we do abstract on higher orders becomes a danger if we are not conscious that we are doing so and retain the primitive confusions or identifications of orders of abstractions.

The following quotation[7] from "Being and Value in a Primitive Culture" by Dorothy D. Lee shows the extensional (by fact, rather than higher order verbal generalizations; see pages 190-93) type of language structure of the Trobrianders (25, p. 402):

If I were to go with a Trobriander to a garden where the taytu, a species of yam, had just been harvested, I would come back and tell you: "There are good taytu there; just the right degree of ripeness, large and perfectly shaped; not a blight to be seen, not one rotten spot; nicely rounded at the tips, with no spiky points; all first-run harvesting, no second gleanings." The Trobriander would come back and say "Taytu"; and he would have said all that I did and more. Even the phrase "There are taytu" would represent a tautology, since existence is implied in being, is, in fact an ingredient of being to the Trobriander. And all the attributes, even if he could find words for them at hand in his own language, would have been tautological, since the concept of taytu contains them all. In fact, if one of these were absent, the object would not have been a taytu. Such a tuber, if it is not at the proper harvesting ripeness, is not a taytu. If it is unripe, it is a bwabawa; if over-ripe, spent, it is not a spent taytu but something else, a yowana. If it is blighted it is a nukunokuna. If it has a rotten patch, it is a taboula; if misshapen, it is an usasu; if perfect in shape but small, it is a yagogu. If the tuber, whatever its shape or condition, is a post-harvest gleaning, it is an ulumadala. When the spent tuber, the yowana, sends its shoots underground, as we put it, it is not a yowana with shoots, but a silisata. When new tubers have formed on these shoots, it is not a silisata but a gadena. . . .

As being is identical with the object, there is no word for *to be;* as being is changeless, there is no word meaning *to become.*

It is significant, also, to find that the *temporal* differentiations and *temporal* generalizations which we have are absent among the Trobrianders:

Trobriand verbs are timeless, making no temporal distinctions. History and mythical reality are not "the past" to the Trobriander. They are forever present, participating in all current being, giving meaning to all his activities and all existence. A Trobriander will speak of the garden which his mother's brother planted, or the one which the mythical Tudava planted, in exactly the same terms with which he will refer to the garden which he himself is planting now; and it will give him satisfaction to do so . . . (25, p. 403).

The Trobriander has no word for history. When he wants to distinguish between different kinds of occasions, he will say, for example, "Molubabeba in-child-his," that is, "in the childhood of Molubabeba," *not a previous phase of this time, but a different kind of time* (25, p. 405; italics mine).

Many excellent papers and books have been written by anthropologists, psychiatrists, linguists, etc., on how different primitive

people or different nationalities dissect nature differently in accordance with the structure of their language.[8]

The main characteristics of primitive or "pre-logical" and "paralogical" language structures may be summarized in their identifications of different orders of abstractions and their lack of abstract terms. The "perceptions" of people on primitive levels are often different from ours, different in the degree to which higher order abstractions are confused, identified with, and projected on lower order abstractions. They identify or ascribe *one value* to essentially many-valued different orders of abstractions and so become impervious to contradictions with "reality" and impervious also to higher order experience.[9]

Aristotelian and Non-Aristotelian Language Systems

Aristotelian Language Structure.—In mankind's cultural evolution, our current abstractions became codified here and there into

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[8] Among the documentations of this are (25) and other works by Dorothy D. Lee; also (44).

[9] The following note was supplied by Miss Schuchardt: "It may be clarifying to elaborate briefly on some of Korzybski's views on primitive types of orientation and his use of the term 'primitive,' as I interpret them. It seems to me that he refers to certain complex socio-cultural, psycho-logico-linguistic, etc., levels of development and their attendant orientations found in different areas in the world. Considering our human class of life as a whole, we may assume that developments from 'primitive' to more advanced types of 'pre-scientific,' to 'scientific 1950' orientations, proceeded in degrees here and there, not linearly but, rather, 'spirally' in accordance with our understanding of ourselves and our environments (see pages 201-2). The developments of one culture were usually eventually intermingled with and carried along with transformations by other cultures.

"The reader is referred to (18), in which Korzybski first formulated his new definition of human beings as a 'time-binding class of life,' unique in that one generation can (potentially) begin where the former left off. This process can be handicapped or stifled in many ways. Korzybski stated in another context that 'The human understanding of time-binding as explained here establishes the deductive grounds for a full-fledged "science of man," where both inductive and deductive methods are utilized. . . . I had to include neuro-linguistic and neuro-semantic (evaluational) environments as environments, and also had to consider geographic, physico-chemical, economic, political, ecological, socio-cultural, etc., conditions as factors which mould human personalities, and so even group behaviour' (23).

"So far the highest orders of abstractions made by man, and those giving the greatest degree of predictability, may be observed in mathematical forms of representations (such as the tensor calculus). To bring to fuller expression the constructive potentialities of man in his ethical, socio-economic, etc., activities, and so keep pace with the achievements in mathematics, science, etc., and their technological consequences, was one of the main aims of Korzybski beginning with *Manhood of Humanity* in 1921.

"There seems no doubt that some primitive types of evaluation still survive in the orientations of most people in present-day Western cultures (and perhaps other cultures also, of which I feel incompetent to speak), involving dichotomies and conflicting premises, as in 'science *versus* religion,' etc. (23).

"I am aware that there are some who take exception to the findings of Lévy-Bruhl, Boas, and others. Korzybski, as far as I know, felt that they conveyed something of value in the analysis of these problems which still remain problems, and will continue to be analyzed with different interpretations and terminologies.—C.S."

systems, for instance the Aristotelian system. The term "system" is used here in the sense of "a whole of related doctrinal functions" (the doctrinal functions of the late Professor Cassius Keyser [17]). We are concerned with this structure here because of its still enormous influence on those of us whose language structure is of the Indo-European type.

I wish to emphasize here that in discussing the inadequacy of the Aristotelian system in 1950, I in no way disparage the remarkable and unprecedented work of Aristotle about 350 B.C. I acknowledge explicitly my profound admiration for his extraordinary genius, particularly in consideration of the period in which he lived. Nevertheless, the twisting of his system and the imposed immobility of this twisted system, as enforced for nearly two thousand years by the controlling groups, often under threats of torture and death, have led and can only lead to more disasters. From what we know about Aristotle and his writings, there is little doubt that, if alive, he would not tolerate such twistings and artificial immobility of the system usually ascribed to him.

Space limitations prevent my going into details here, and I can but refer the reader to my larger work on this subject, *Science and Sanity: An Introduction to Non-aristotelian Systems and General Semantics* (21). A rough summary in the form of a tabulation of Aristotelian and non-Aristotelian orientations given in that volume (21, pp. xxv ff.) may help to convey to the reader the magnitude of this problem.

Here I will stress some of the main structural considerations of the Aristotelian system and their effects on our world outlook, evaluations, and, therefore, even "perceptions." Practically since the beginning of Aristotle's formulations, and particularly after their later distortions, there have been many criticisms of them, mostly ineffective because unworkable. One of their most serious inadequacies was very lately found to be the belief in the uniqueness of the subject-predicate form of representation, in the sense that every kind of relation in this world can be expressed in that form, which is obviously false to facts and would make science and mathematics impossible.

I will quote the following remarks [10] of Bertrand Russell, who did epoch-making work in his analysis of subject-predicate relations:

The belief or unconscious conviction that all propositions are of the subject-predicate form—in other words, that every fact consists in some thing having some quality—has rendered most philosophers incapable of giving any account of the world of science and daily life . . . (37, p. 45; 21, p. 85).

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[10] By permission of Harcourt, Brace & Co., Inc.

Philosophers have, as a rule, failed to notice more than two types of sentence, exemplified by the two statements "this is yellow" and "buttercups are yellow." They mistakenly suppose that these two were one and the same type, and also that all propositions were of this type. The former error was exposed by Frege and Peano; the latter was found to make the explanation of order impossible. Consequently, the traditional view that all propositions ascribe a predicate to a subject collapsed, and with it the metaphysical systems which were based upon it, consciously or unconsciously (39, p. 242; 21, p. 131).

Asymmetrical relations are involved in all series—in space and time, greater and less, whole and part, and many others of the most important characteristics of the actual world. All these aspects, therefore, the logic which reduces everything to subjects and predicates is compelled to condemn as error and mere appearance (37, p. 45; 21, p. 188).

In this connection I may quote some remarks by Alfred Whitehead, who also did most important work on this subject:

. . . the subject-predicate habits of thought . . . had been impressed on the European mind by the overemphasis on Aristotle's logic during the long mediaeval period. In reference to this twist of mind, probably Aristotle was not an Aristotelian (49, pp. 80-81; 21, p. 85).

The evil produced by the Aristotelian "primary substance" is exactly this habit of metaphysical emphasis upon the "subject-predicate" form of proposition (49, p. 45).[11]

The alternate philosophic position must commence with denouncing the whole idea of "subject qualified by predicate" as a trap set for philosophers by the syntax of language (48, p. 14; 21, p. 85).[12]

In his "Languages and Logic" Benjamin Lee Whorf makes an analysis of primitive and other language structures (50, pp. 43-52).

The Indo-European languages and many others give great prominence to a type of sentence having two parts, each part built around a class of words—substantives and verbs—which those languages treat differently in grammar. . . . The Greeks, especially Aristotle, built up this contrast and made it a law of reason. Since then, the contrast has been stated in logic in many different ways: subject and predicate, actor and action, things and relations between things, objects and their attributes, quantities and operations. And, pursuant again to grammar, the notion became ingrained that one of these classes of entities can exist in its own right but that the verb class cannot exist without an entity of the other class, the "thing" class. . . . Our Indian languages show that with a suitable grammar we may have intelligent sentences that cannot be broken into subjects and predicates.[13]

[11] From A. N. Whitehead, *Process and Reality*. Copyright 1929 by The Macmillan Co., and used with their permission and that of Mrs. A. N. Whitehead.
[12] By permission of Cambridge University Press and T. North Whitehead.
[13] Reprinted from *The Technology Review*, April, 1941, edited at the Massachusetts Institute of Technology.

The subject-predicate structure of language resulted from the ascribing of "properties" or "qualities" to "nature," whereas the "qualities," etc., are actually manufactured by our nervous systems. The perpetuation of such projections tends to keep mankind on the archaic levels of anthropomorphism and animism in their evaluations of their surroundings and themselves.

The main verb through which these outlooks were structuralized in our language is the verb "to be." Here I will give a very brief analysis of some uses of the little word "is," and what important effects its use has had on our "thinking." A full investigation of the term "is" has been found to be very complex. The great mathematician and logician, Augustus de Morgan, one of the founders of mathematical logic, has justly said, in his *Formal Logic* (1847) (8, p. 56):

> The complete attempt to deal with the term *is* would go to the form and matter of everything in *existence*, at least, if not to the possible form and matter of all that does not exist, but might. As far as it could be done, it would give the grand Cyclopaedia, and its yearly supplement would be the history of the human race for the time.

Here, following Russell, we can only state roughly that in the Indo-European languages the verb "to be" has at least four entirely different uses (36, p. 64):

1. As an auxiliary verb: It is raining.
2. As the "is" of existence: I am.
3. As the "is" of predication: The rose is red.
4. As the "is" of identity: The rose is a flower.

The first two are difficult to avoid in English, and relatively harmless. The other two, however, are extremely pertinent to our discussion. If we say, "The rose is red," we falsify everything we "know" in 1950 about our nervous systems and the structure of the empirical world. There is no "redness" in nature, only different wave lengths of radiation. *Our reaction* to those light waves is only our individual reaction. If one is a Daltonist, for example, he will see "green." If one is color-blind, he will see "gray." We may correctly say, "We see the rose as red," which would not be a falsification.

The fourth, the "is" of identity, if used without consciousness of the identifications implied, perpetuates a primitive type of evaluation. In some languages—the Slavic, for instance—there is no "is" of identity. If we say, "I classify the rose as a flower," this is struc-

turally correct, and implies that our nervous system is doing the classifying.

The importance of that "is" of identity embedded in the structure of our language can hardly be overemphasized, as it affects our neuro-evaluational reactions and leads to mis-evaluations in the daily life of every one of us which are sometimes very tragic.

Here let us recall the "philosophical grammar" of our language which we call the "laws of thought," as given by Jevons (12; 21, p. 749):

1. The law of identity. Whatever is, is.
2. The law of contradiction. Nothing can both be, and not be.
3. The law of excluded third. Everything must either be, or not be.

These "laws" have different "philosophical" interpretations, but for our purpose it is enough to emphasize that (a) the second "law" represents a negative statement of the first, and the third represents a corollary of the former two; namely, no third is possible between two contradictories; and (b) the verb "to be," or "is," and "identity" play a most fundamental role in these formulations and the consequent semantic reactions.

"Identity" as a "principle" is defined as "absolute sameness in 'all' ('every') respects." It can never empirically be found in this world of ever-changing processes, nor on silent levels of our nervous systems. "Partial identity" or "identity in *some* respects" obviously represents only a self-contradiction in terms. Identification, as the term is used here, can be observed very low in the scale of life. It may be considered the first organic and/or organismal relating of "cause" and "effect," order, etc., when lower organisms responded effectively to signals "as if" they were actualities. On lower levels such organismal identifications have survival value. Laboratory observations show that the amoeba will exhibit reactions to artificial stimulations, without food value, similar to its reactions to stimuli with food value. The amoeba as a living bit of protoplasm has *organismally identified* an artificial, valueless-as-food, laboratory stimulus with "reality." Thus, although the reaction was there, the evaluation was inappropriate, which does not change the biological fact that without such identifications, or automatic response to a stimulus, no amoeba could survive.

Advancing in the scale of life, the identifications become fewer, the identification reactions become more flexible, "proper evaluation" increases, and the animals become more and more "intelligent," etc.