CHAPTER XXV

ON THE STRUCTURAL DIFFERENTIAL

> You cannot recognise an event; because when it is gone, it is gone . . . But a character of an event can be recognised. . . . Things which we thus recognise I call objects. (573)
>
> A.N. WHITEHEAD

> When there is a judgment of identity or difference, it is because a particular associative reaction of the second order is occurring, conditioned by the primary reaction, whether the same or different; this is a gain in perceptive knowledge. (411)
>
> HENRI PIÉRON

> To some extent, the practice of thinking, deciding, feeling, appreciating, and sympathizing molds the personality of the thinker. Presumably, the stable patterns of cortical association are changed by the performance of these acts just as on a lower plane muscles are changed by systematic exercises. (222)
>
> C. JUDSON HERRICK

> Experimental analysis of the memory of forms insusceptibIe of symbolic schematization has convinced me of the great importance of ocular kinaesthesia and the small part played by visualization in nearly all individuals, with the general illusion of really visual representations, a very strong illusion, especially when symbolic and verbal schematization is possible. Ideas which are substituted for visual representation, and play the same part, are easily mistaken for it. (411)
>
> HENRI PIÉRON

> The eyes of the dog give to him sometimes a more intelligent expression than that of his master, and there is no doubt that he uses them to very good advantage; but they are not our eyes. (221)
>
> C. JUDSON HERRICK

Before I recapitulate, in the form of a structural diagram, what has been said in the previous chapter, I must explain briefly the use of the term ‘event’. The introduction of new terms in a language always represents initial difficulties to the student. It is always advisable, if only possible, to introduce terms which are structurally close to our daily experience. At present, in physics, we have a dual language; one of ‘space-time’, in which ‘matter’ is connected somehow with its ‘curvature’, the other of the quanta. The structure of both languages is quite different, and at present scientists have not succeeded in translating one language into the other. Einstein, in his latest unified field theory, has succeeded, by the introduction of new notions, in amalgamating the electromagnetic phenomena with the general theory of relativity; but even this new language does not include the quantum theory. For my purpose, it is important to amalgamate both languages as an intuitive pictorial device, which, from a technical point of view, still awaits formulation. As the ‘space-time’ continuum is the closest to our daily experience, I accept the language of ‘events’ as fundamental and add only a few

pictorial notions taken from the quantum theory. There is no doubt that the day is not far off when the unified field theory will be extended to include the new quantum theory, and so this anticipation does not appear illegitimate.

If we take something, anything, let us say the object already referred to, called ‘pencil’, and enquire what it represents, according to science 1933, we find that the ‘scientific object’ represents an ‘event’, a mad dance of ‘electrons’, which is different every instant, which never repeats itself, which is known to consist of extremely complex dynamic processes of very fine structure, acted upon by, and reacting upon, the rest of the universe, inextricably connected with everything else and dependent on everything else. If we enquire *how many characteristics* (*m.o*) we should ascribe to such an event, the only possible answer is that we should ascribe to an event infinite numbers of characteristics, as it represents a process which never stops in one form or another; neither, to the best of our knowledge, does it repeat itself.

In our diagram, Fig. 1, we indicate this by a parabola (A), which is supposed to extend indefinitely, which extension we indicate by a broken off line (B). We symbolize the characteristics by small circles (C), the number of which is obviously indefinitely great.

Underneath, we symbolize the ‘object’ by the circle (O), which has a finite size. The characteristics of the object we also denote by similar little circles (C’). The number of characteristics which an object has is large but *finite*, and is denoted by the finite number of the small circles (C’).

Then we attach a label to the object, its name, let us say ‘pencil$_1$’, which we indicate in our diagram by the label (L). We ascribe, also, characteristics to the labels, and we indicate these characteristics by the little circles (C”).

The number of characteristics which we ascribe by *definition* to the label is still smaller than the number of characteristics the object has. To the label ‘pencil$_1$’ we would ascribe, perhaps, its length, thickness, shape, colour, hardness, . But we would mostly *disregard* the accidental characteristics, such as a scratch on its surface, or the kind of glue by which the two wooden parts of the objective ‘pencil’ are held together, . If we want an objective ‘pencil’ and come to a shop to purchase one, we say so and specify verbally only these characteristics which are of particular *immediate interest* to us.

It is clear that the object is often of interest to us for some special characteristics of immediate usefulness or value. If we enquire as to the neurological processes involved in registering the object, we find that the

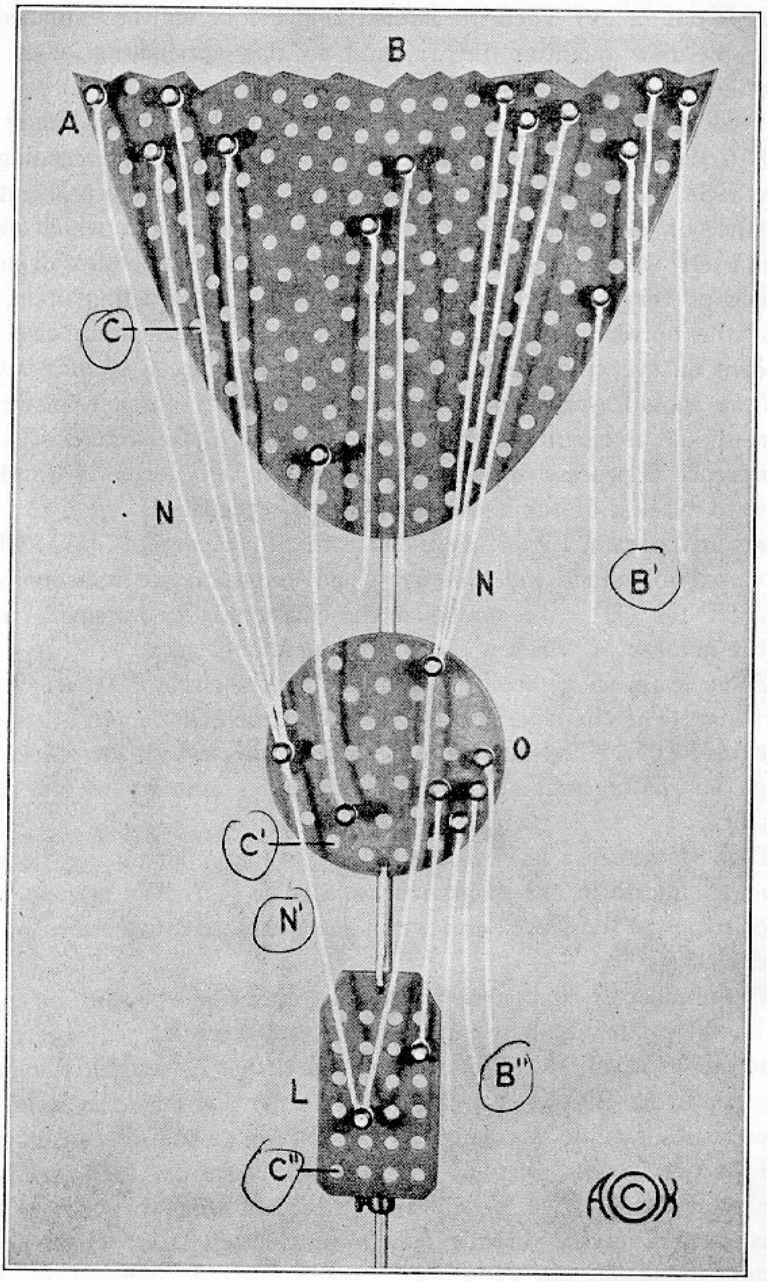

FIG. 1

nervous system has *abstracted,* from the infinite numbers of sub-microscopic characteristics of the event, a large but finite number of macroscopic characteristics. In purchasing a 'pencil' we usually are not interested in its smell or taste. But if we were interested in these abstractions, we would have to find the smell and the taste of our object by experiment.

But this is not all. The object represents in this language a gross macroscopic abstraction, for our nervous system is not adapted for abstracting directly the infinite numbers of characteristics which the endlessly complex dynamic fine structure of the event represents. We must consider the object as a 'first abstraction' (with a finite number of characteristics) from the infinite numbers of characteristics an event has. The above considerations are in perfect accord not only with the functioning of the nervous system but also with its structure. Our nervous system registers objects with its lower centres first, and each of these lower specific abstractions we call an object. If we were to define an object, we should have to say that an object represents a first abstraction with a finite number of *m.o* characteristics from the infinite numbers of *m.o* characteristics an event has.

Obviously, if our inspection of the object is through the lower nervous centres, the number of characteristics which the object has is larger (taste, smell. , of our $pencil_1$) than the number of characteristics which we need to ascribe to the label. The label, the *importance* of which lies in its *meanings to us,* represents a still higher abstraction from the event, and usually labels, also, a *semantic reaction.*

We have come to some quite obvious and most important structural conclusions of evaluation of the *non-el* type. We see that the object *is not* the event but an abstraction from it, and that the label *is not* the object nor the event, but a still further abstraction. The nervous process of abstracting we represent by the lines (N), (N'). The characteristics *left out,* or not abstracted, are indicated by the lines (B'), (B").

For our semantic purpose, the distinction between lower and higher abstractions seems fundamental; but, of course, we could call the object simply the first order abstraction, and the label, with its meanings, the second order abstraction, as indicated in the diagram.

If we were to enquire how this problem of abstracting in different orders appears as a limiting case among animals, we should select a definite individual with which to carry on the analysis. For our analysis, which is deliberately of an extensional character, we select an animal with a definite, proper name, corresponding to 'Smith' among us. Such an animal suggests itself at once on purely verbal grounds.

It is the one we call ‘Fido’. Practically all English speaking people are acquainted with the name ‘Fido’. Besides, most of us like dogs and are aware of how ‘intelligent’ they are.

Investigations and experimenting have shown that the nervous system of a Fido presents, in structure and function, marked similarities to that of a Smith. Accordingly, we may assume that, in a general way, it functions similarly. We have already spoken of the event in terms of recognition; namely, that we can never recognize an event, as it changes continually. Whitehead points out the fundamental difference between an event and an object in terms of *recognition;* namely, that an event cannot be recognized, and that an object can be recognized. He defines the object as the recognizable part of the event. The use of this definition helps us to test whether Fido has ‘objects’. Since experiments show that Fido can recognize, we have to ascribe to Fido objects by definition. If we enquire what the objects of Fido represent, the structure and function of his nervous system, which are very similar to ours, would suggest that Fido’s objects represent, also, *abstractions* of some low order, from the events. Would his objects appear the ‘same’ as ours ? No. First of all, the abstractions from events which we call objects are not the ‘same’, even when abstracted by different individuals among humans. An extreme example of this can be given in that limited form of colour-blindness which is called Daltonism, when an object which appears green to most persons appears red to the certain few who suffer from this disease. There is, at present, no doubt that the nervous abstractions of all organisms are individual, not only with each individual, but at different ‘times’ with one individual, and differ, also, for these higher groups (abstractions) which we call species. We can infer how the world appears to a particular organism only if its nervous structure is quite similar to our own. With species widely separated neurologically, such inferences are entirely unjustified. So, on general grounds, the ‘objects’ of Fido are not the ‘same’ as ours; on neurological grounds, they appear only similar. In daily experience, we know that we should have difficulty in recognizing our own glove among a thousand, but Fido could perform this detection for us much better. So the ‘same’ glove must have been registered in the nervous system of Fido differently from the way it has been in ours.

We indicate this similarity of the human object (O_h) and the animal object (O_a) by making the circle (O_a) smaller, and emphasize the difference between the objects by differently spacing the holes representing the characteristics. Whether we call the objects (O_h) and (O_a) ‘first order’ abstractions or ‘100th order’ abstractions, or simply ‘lower

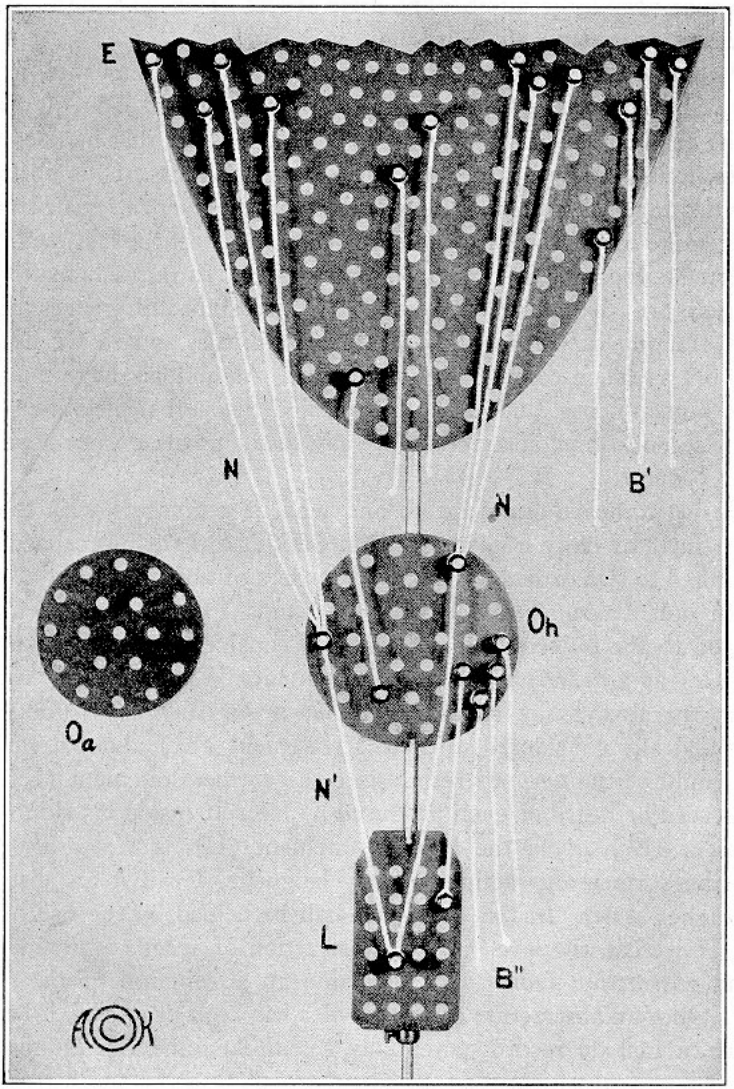

FIG. 2

order' abstractions, is mainly optional. There is no neurological doubt that all 'objects' represent *low order abstractions* and the use of a number to indicate the order is simply a matter of convention and convenience. If we were to start with the simplest living cell, we might ascribe to its abstractions the term 'first order' abstractions. If we were to survey in this way all known forms of life, we might ascribe to Fido

and Smith very large numbers as their orders of abstractions. But this is unnecessary, as we shall presently see.

We note that Fido does abstract from events, at any rate, in lower orders, 'has objects' (O_a) which he can recognize. The question is, does he abstract in higher orders ? We might answer that he does within certain limits. Or, we might prefer to take the limits of his abstracting capacities for granted and to include them all as lower order abstractions. For the sake of convenience and simplicity, we select the last method and say that he does not abstract in higher orders. In our schematic representation, we shall discover some very important differences between the abstracting capacities of humans and animals, and so we introduce here only as much complexity as we need. As animals have no speech, in the human sense, and as we have called the verbal labelling* of the object 'second order abstraction' we say that animals do not abstract in higher orders.

If we compare our diagram and what it represents with the well-known facts of daily life, we see that Smith's abstracting capacities are not limited to two orders, or to any '*n*' orders of abstractions.

In our diagrams, the label (L) stands for the *name* which we assigned to the object. But we can also consider the level of the first label (L) as a *descriptive* level or statement. We know very well that Smith can always say something *about* a statement (L), on record. Neurologically considered, this *next* statement (L_1) about a statement (L) would be the nervous response to the former statement (L) which he has seen or heard or even produced by himself inside his skin. So his statement (L_1), *about* the former statement (L), is a *new abstraction* from the former abstraction. In my language, I call it an abstraction of a higher order. In this case, we shall be helped by the use of numbers. If we call the level (L) an abstraction of *second order*, we must call an *abstraction from this abstraction* an abstraction of *third order*, (L_1). Once an abstraction of third order has been produced, it becomes, in turn, a fact on record, potentially a stimulus, and can be abstracted further and a statement made about it, which becomes an abstraction of the fourth order (L_2). This process has no definite limits, for, whenever statements of any order are made, we can always make a statement about them, and so produce an abstraction of still higher order. This capacity is practically universal among organisms which we call 'humans'. Here we reach a fundamental difference between 'Smith'

* In the present system the terms 'label', 'labelling'. , are always connected with their meanings, and so, for simplicity, from now on the reference to meanings will be omitted.

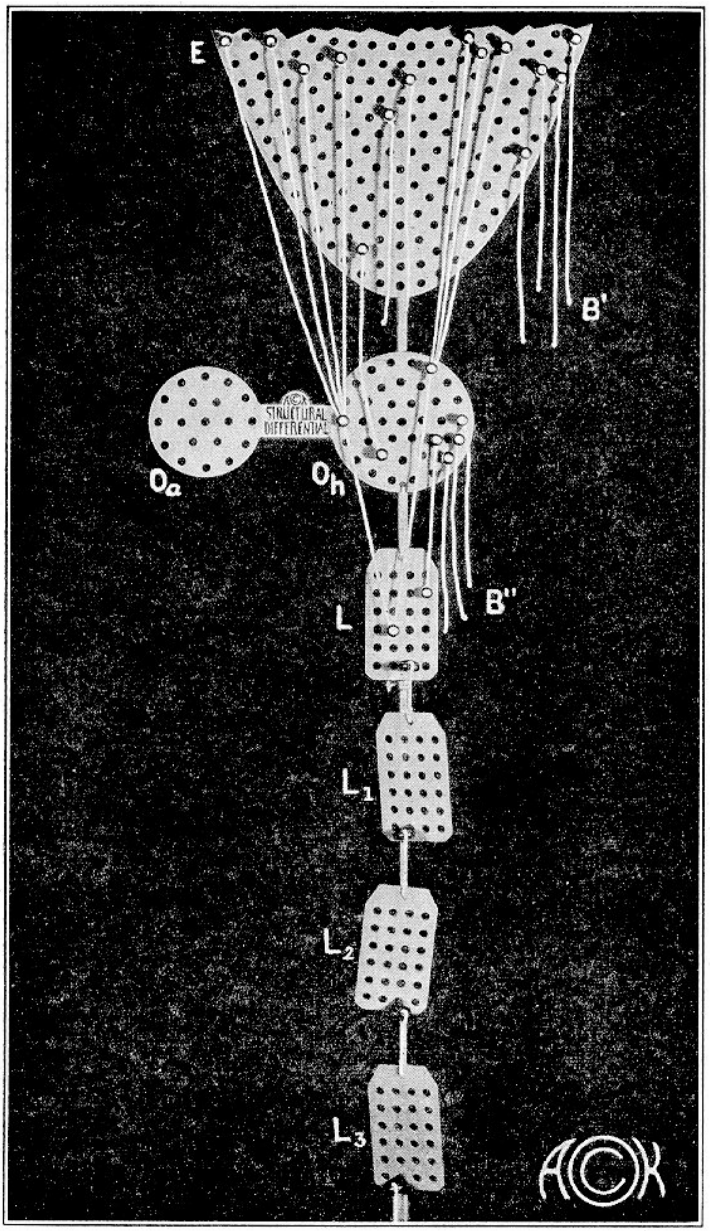

FIG. 3
THE STRUCTURAL DIFFERENTIAL

and ‘Fido’. Fido’s *power of abstracting stops somewhere,* although it may include a few orders. Not so with ‘Smith’; his power of abstracting has no known limit (see Part VI).

Perhaps the reader is semantically perplexed by the unfamiliarity of the language of this analysis. It must be granted that the introduction of any new language is generally perplexing, and it is justified *only* if the new language accomplishes something structurally and semantically which the old languages did *not* accomplish. In this case, it has brought us to a new *sharp* distinction between ‘man’ and ‘animal’. The number of orders of abstractions an ‘animal’ can produce is *limited.* The number of orders of abstractions a ‘man’ can produce is, in principle, *unlimited.*

Here is found the fundamental mechanism of the ‘time-binding’ power which characterizes man, and which allows him, in principle, to gather the *experiences* of all past generations. A higher order abstraction, let us say, of the $n+1$ order, is made as a response to the stimulus of abstractions of the nth order. Among ‘humans’ the abstractions of high orders produced by others, as well as those produced by oneself are stimuli to abstracting in still higher orders. Thus, in principle, we start where the former generation left off. It should be noticed that, in the present analysis, we have abandoned the structurally *el* methods and language, and the whole analysis becomes simple, although non-familiar because it involves new *non-el s.r.*

The preceding explanation justifies my former statement that the ascribing of absolute numbers to the orders of abstractions of ‘animal’ and of ‘man’ is unnecessary. In our diagram we could ascribe as many orders of abstractions to the animal as we please; yet we should have to admit, for the structural correctness of description of experimental facts, that the ‘animal’s’ power of abstracting has limits, while the number of orders of abstractions a ‘man’ can produce has no known limits.

From an epistemological and semantic point of view, there is an important benefit in this method. In this language, we have discovered *sharp* verbal and analytical methods, in terms of the *non-el* ‘orders of abstractions’, by which these two ‘classes of life’, or these two high abstractions, can be differentiated. The terms ‘animal’ and ‘man’ each represent a name for an abstraction of very high order, and not a name for an objective individual. To formulate the difference between these ‘classes’ becomes a problem of *verbal structural ingenuity and methods,* as in life we deal only with absolute individuals on the un-speakable, objective levels. In our diagram, we could hang on the ‘animal’ object as many levels of labels, which stand for higher order abstractions, as

we please; yet somewhere we would have to stop; but with ‘man’ we could continue indefinitely.

This *sharp* difference between ‘man’ and ‘animal’ may be called the *‘horizontal difference’*. The habitual use of *our hands* in showing these different horizontal levels is extremely useful in studying this work, and it facilitates greatly the acquiring of the structurally new language and corresponding *s.r.* The solution of the majority of human semantic difficulties (evaluation), and the elimination of pathological identification, lie precisely in the maintenance, without confusion, of the sharp differentiation between these horizontal levels of orders of abstractions.

Let us now investigate the possibility of a sharp *‘vertical difference’*. We have already come to the conclusion that Fido abstracts objects from events, and that, if his nervous system is similar to ours, his lower order abstractions are similar to ours. Here we may ask the question: Does Fido ‘know’, or can he ‘know’, that he abstracts ? It seems undeniable that Fido does not ‘know’ and *cannot ‘know’* that he abstracts, *because it takes science to ‘know’* that we abstract, and Fido has no science. It is semantically important that we should be entirely convinced on this point. We do not argue about the kind of ‘knowledge’ animals may have or about the relative value of this ‘knowledge’ as compared with ours. Science was made possible by the human nervous system and the invention of extra-neural means for investigation and recording, which animals lack entirely. Whoever claims that animals have science should, to say the least, show libraries and scientific laboratories and instruments produced by animals.

We see that, although Fido has abstracted, he not only does not ‘know’ but *cannot* ‘know’ that he abstracts, as this last ‘knowledge’ is given exclusively by science, which animals do not have. *In this consciousness of abstracting, we find a most important ‘vertical difference’ between Smith and Fido.* The difference is sharp again.

If, in our diagram, Fig. 4, we ascribe to Fido more horizontal orders of abstractions, let us say two, (H_1) and (H_2), nevertheless, the ‘animal’ stops somewhere. This extended diagram illustrates that ‘man’ is capable of abstracting in higher and higher orders indefinitely. In this diagram, we symbolize the fact that Fido does not and cannot ‘know’ that he abstracts, by not connecting the characteristics of his object (O_a) by lines (A_n) with the event (E). *Without science, we have no event; Fido’s gross macroscopic object* (O_a) represents ‘all’ *that he ‘knows’ or cares about.* We see that the *vertical difference* (V_1) formulated as consciousness of abstracting for Smith appears sharp, and completely differentiates Fido from Smith. In it, we find the semantic

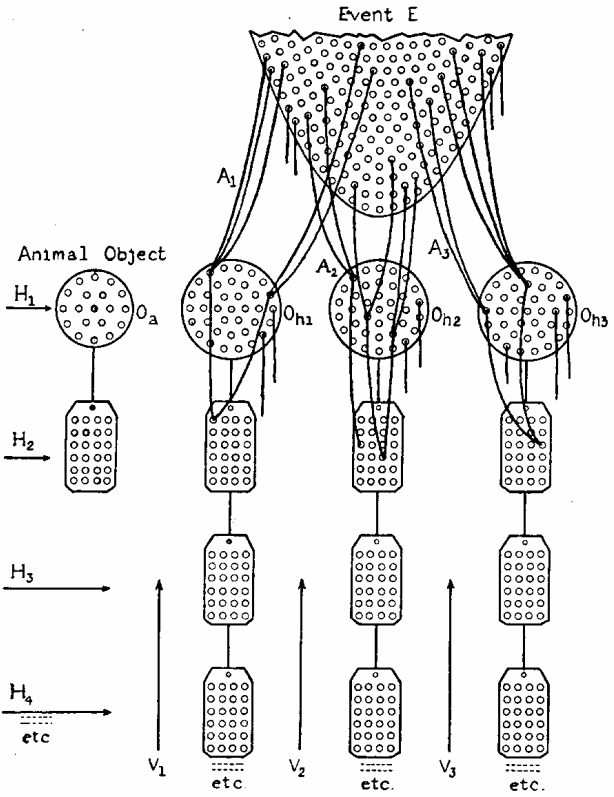

FIG. 4

mechanism of all proper *evaluation*, based on *non-identification* or the differentiation between orders of abstractions, impossible with animals.

In this diagram we have introduced more objects, because each individual abstracts, in general, from an event *different* objects, in the sense that they are *not identical* in every respect. We must be aware continuously that in life on the unspeakable objective level we deal only with absolute individuals, be they objects, situations, or *s.r.* The vertical stratification not only gives us representation for the sharp difference between 'man' and 'animal', but also allows us to train our *s.r* in the absolute individuality of our objects and those of different observers, and for the differences between their individual abstractions. What has been said here applies equally to all first order effects on the objective level, such as immediate feelings, .

The present theory can only be fully beneficial when the reader acquires in *his system* the habitual feeling of both the vertical and the horizontal stratifications with which identification becomes impossible.

In the experiments of Doctor Philip S. Graven with the ‘mentally’ ill, training in the realization of this stratification has either resulted in complete recovery or has markedly improved the conditions of the patient.

The diagram is used in *two* distinct ways. One is by showing the abstracting from the event to the object, and the applying of a name to the object. The other is by illustrating the level of statements which can be made about statements. If we have different objects, and label them with different names, say, A_1, A_2, A_3 . . . A_n. , we still have no proposition. To make a proposition, we have to accept some undefined relational term, by which we relate one object to the other. The use of this diagram to illustrate the *levels or orders of statements* implies that we have selected some metaphysics as expressed in our undefined relational terms. We should be fully aware of the difference between these *two* uses of the one diagram for the structural illustration of two aspects of one process.

If we enquire: What do the characteristics of the event represent ? We find that they are given only by science and represent at each date the highest, most verified, most reliable abstractions ‘Smith’ has produced.

Theory and practice have shown that the points illustrated by the above structural diagrams have a crucial semantic significance, as, without using them, it is practically impossible to train ourselves or others and to accomplish the psychophysiological re-education. For this reason, the diagrams have been produced for home and school use, separately, in the simplified form illustrated in Fig. 5. This structural diagram is called the ‘Anthropometer’ or the ‘Structural Differential’, as it illustrates the fundamental structural difference between the world, *and so the environment*, of the animal and man. If we live in such a very complex *human* world, but our *s.r*, owing to wrong *evaluation,* are adjusted only to the simpler animal world, free, to say the least, from man-made complications, then adjustment and sanity for *humans* is impossible. Our *s.r* are bound to follow the simpler animalistic patterns, *pathological for man.* All human experience, scientific or otherwise, shows that we still copy animals in our nervous reactions, trying to adjust ourselves to a world of fictitious, simple *animal structure*, while *actually* we live in a world of very complex *human structure* which is quite different. Naturally, under such conditions, which, ultimately, turn out to be delusional, *human* adjustment is impossible and results in false evaluations, animalistic *s.r*, and the general state of un-sanity.

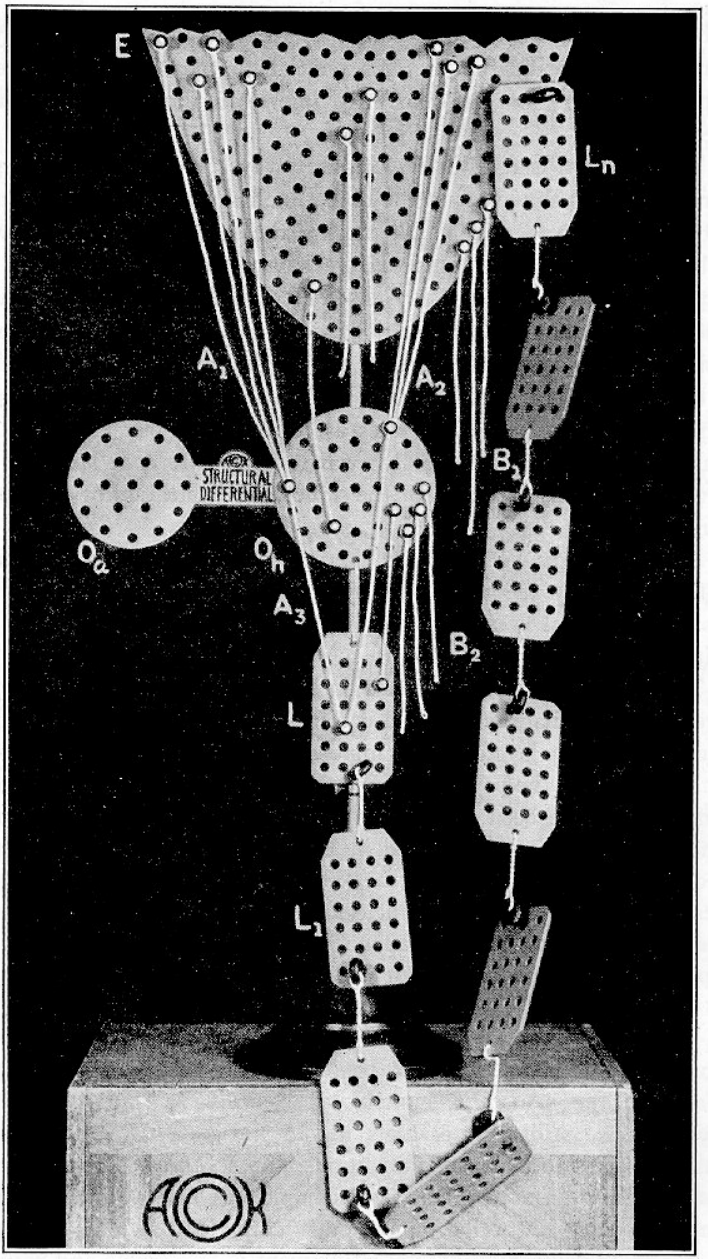

FIG. 5
THE STRUCTURAL DIFFERENTIAL

Any one who will work out the present analysis with the aid of the Differential will find clearly that the majority of human difficulties, the preventable or curable 'mental' or semantic disturbances included, are due to this fatal *structural* error, resulting in false evaluation due to identification or lack of differentiation.

The Structural Differentials are manufactured in two forms: (1) in a printed map-like scroll for hanging on the walls or black-board; (2) in relief form with detachable labels. As the main problem is to train and re-educate the *semantic psychophysiological reactions* in non-identity, the relief form is the most effective because of the freely hanging strings, detachable labels. , which give means to engage more nerve centres in the training. I shall describe the latter type in some detail.

For the event we have a parabola in relief (E), broken off to indicate its limitless extension. The disk (O_h) symbolizes the human object; the disk (O_a) represents the animal object. The label (L) represents the higher abstraction called a name (with its meaning given by a definition). The lines (A_n) in the relief diagram are hanging strings which are tied to pegs. They indicate the process of abstracting. The free hanging strings (B_n) indicate the most important characteristics *left out*, neglected, or forgotten in the abstracting. The Structural Differentials are provided with a number of separate labels attached to pegs. These are hung, one to the other, in a series, and the last one may be attached by a long peg to the event, to indicate that the characteristics of the event represent the highest abstractions we have produced at each date. *The objective level is not words, and cannot be reached by words alone. We must point our finger and be silent, or we shall never reach this level.* Our personal feelings, also, *are not* words, and belong to the objective level.

The whole of the present theory can be illustrated on the Structural Differential by the childishly simple operation of the teacher pointing a finger to the event and then to the object, saying 'This *is not* this' and insisting on silence on the pupil's part. One should continue by showing with the finger the object and the label, saying again 'This *is not* this', *insisting on silence* on the objective level; then, showing the first and the second label, saying again 'This *is not* this', .

In a more complex language, one would say that the object *is not* the event, that the label *is not* the un-speakable object, and that a statement about a statement *is not* the 'same' statement, nor on one level. We see and are made to visualize that the $\overline{A}$-system is based *on the denial of the 'is' of identity,* which necessitates the differentiation of orders of abstractions.

The little word ‘to be’ appears as a very peculiar word and is, perhaps, responsible for many human semantic difficulties. If the anthropologists are correct, only a few of the primitive peoples have this verb. The majority do not have it and do not need it, because all their *s.r* and languages are practically based on, and involve, literal *identification*.[1] In passing from the primitive stage of human society to the present slightly higher stage, which might be called the infantile stage, or infantile period, too crude identification was no longer possible. Languages were built, based on slightly modified or limited identification, and, for flexibility, the ‘is’ of identity was introduced explicitly. Although very little has been done in the *structural* analysis of languages in general, and of those of primitive peoples in particular, we know that in the Indo-European languages the verb ‘to be’, among others, is used as an *auxiliary verb* and also for the purpose of positing false to facts identity. With the primitive prevalent lack of consciousness of abstracting, and the primitive belief in the magic of words, the *s.r* were such that words were identified with the objective levels. Perhaps it is not too much to say that the primitive ‘psychology’ peculiarly required such a fundamental identity. Identity may be defined as ‘absolute sameness in all respects’ which, in a world of ever-changing processes and a human world of indefinitely many orders of abstractions, appears as a *structural* impossibility. Identity appears, then, as a primitive ‘over-emotional’ generalization of similarity, equality, equivalence, equipollence. , and, in no case, does it appear in fact as ‘absolute sameness in all respects’. As soon as the structurally *delusional* character of identity is pointed out, it becomes imperative for sanity to eliminate such delusional factors from our languages and *s.r*. With the advent of ‘civilization’, the use of this word was enlarged, but some of the fundamental primitive implications and psycho-logical semantic effects were preserved. If we use the ‘is’ at all, and it is extremely difficult to avoid entirely this auxiliary verb when using languages which, to a large extent, depend on it, we must be particularly careful not to use ‘is’ as an identity term.

In 1933, the amount of knowledge we have about the primitive peoples is considerable. Anthropologists have gathered an enormous number of descriptive facts, on which they practically all agree, but the several schools of anthropology differ widely as to the interpretation of these facts. Roughly speaking, the British school tries to interpret the facts from the point of view of ascribing to the primitives the deficient ‘psychology’ and ‘logic’ of the white man. The French and Polish schools avoid these unjustified tendencies, and attempt to reconstruct the original primitive ‘psychologies’ and ‘logics’ which could be responsible

for the developments, or the lack of developments, of the primitive peoples. All schools accept, as yet, the existing *el* 'psychologies' and two-valued *A* 'logic' as the standard, normal, and, perhaps, even as the final disciplines for an adult human civilization. No school suspects that an *A* stage of civilization appears to be built, to a large extent, on the slightly refined *primitive identifications* which produced only an *infantile period* of human development. They do not suspect that a future $\overline{A}$ society may differ as greatly from the present *A* society as the latter differs from the primitive society.

In my work, I prefer to follow the French and Polish schools of anthropology, as it seems to me that these schools are freer from semantic identification and aristotelianism than the others.

In 1933, it seems, beyond doubt, that *if* any single *semantic* characteristic could be selected to account for the primitive state of the individuals and their societies, we could say, without making too great a mistake, that it would be found in *identification*, understood in the more general sense as it is used in the present work. There is very little doubt, at present, that different physico-chemical factors, environment, climate, kind of food, colloidal behaviour, endocrine secretions. , are fundamental factors which condition the potentialities, as well as the behaviour, of an organism. It is equally certain that, as an end-result, these physico-chemical factors are connected with definite types of *s.r.* It is known that the reverse is also true; namely, that *s.r* affect colloidal behaviour, endocrine secretions, and metabolism. The exact type of dependence is not known, because too little experimenting on humans has been made. The present analysis is conducted from the semantic point of view, and its results, no matter how far-reaching, are limited to this special aspect.

Simple analysis shows that identification is a necessary condition which underlies the reactions of animals, of infants, and of primitives. If found in 'civilized' grown-ups, it equally indicates some remains of earlier periods of development, and can always be found in the analysis of any private or public difficulties which prevent any satisfactory solution. Identification in a slightly modified form represents, also, the very foundation of the *A*-system and those institutions which are founded on this system.

Mathematics gives us practically the only linguistic system free from pathological identifications, although mathematicians use this term uncritically. The more identification is eliminated from other sciences, the more the mathematical functional semantics and method are applied, and the further a given science progresses.

The best we know in 1933 is that the general structure of the world was not different in prehistoric times from what we find it today. We have no doubt that the materials in great antiquity consisted of molecules, molecules of atoms, and atoms of electrons and protons. , or whatever else we shall be able to discover some day. We have no doubt that blood was circulating in the higher animals and humans, that vitamins exhibited very similar characteristics as today, that different forms of radiant energy influenced colloidal behaviour. , . , regardless of whether or not the given animal, primitive man or infant 'knew' or 'knows' about them.

How about the primitive *physical needs and wants* of an animal, a primitive man, and an infant ? Besides all mystical and mythological reasons for identification, the structural facts of life *necessitated identification* on this level of development. *Without* modern knowledge, what a hungry animal, primitive man, or an infant 'wants' 'is' an 'object', say, called an 'apple'. He would 'define' his 'apple' the best he could as to shape, colour, smell, taste, . Was this what his organism needed ? Obviously not. We could, at present, produce an undigestible synthetic apple which would satisfy his eventual objective definitions; he might eat it, many such 'apples', and eventually die of hunger. Is an abundant and pleasant diet free from unsuspected and unseen 'vitamins' satisfactory for survival ? Again, no ! Thus, we see clearly that what the organism needed for survival were the physico-chemical processes, not found in the 'ordinary object', but exclusively in the 'scientific object', or the event. Here we find the age old and necessary, on this early level, identification of the ordinary object with the scientific object. This form of identification is extremely common even in 1933, and, to a large extent, responsible for our low development, because, no matter what we 'think' or feel about an object, an object represents *only* an abstraction of low order, only a *general symbol* for the *scientific object*, which remains the only possible survival concern of the organism. But, obviously, such identification, being false to facts, can never be entirely reliable. If any one fancies that he deals with 'ultimate reality', yet that *m.o* reality represents only a shadow cast by the scientific object; he begins, with experience, to distrust the object and populates his world with delusional mysticism and mythologies to account for the mysteries of the shadow.

As any organism represents an *abstracting* in *different orders* process, which, again, the animal, the primitive man, and the infant cannot know, they, by necessity, identify different orders of abstractions. Thus, names are identified with the un-speakable objects, names for action with the un-speakable action itself, names for a feeling with the un-

speakable feelings themselves, . By confusing descriptions with inferences and descriptive words with inferential words, the 'judgements', 'opinions', 'beliefs', and similar *s.r*, which represent mostly, if not exclusively, inferential semantic end-products, are projected with varying pathological intensity on the outside world. By this method pre-'logical' primitive semantic attitudes were built. Mere similarities were evaluated as identities, primitive syllogisms were built of the type: 'stags run fast, some Indians run fast, some Indians are stags'. It is common to find among primitive peoples a kind of 'logic' based on the *post hoc, ergo propter hoc* (after this and, therefore, because of this) fallacy which obviously represents an identification of an ordinal description with an inference. The 'question begging epithets', which exercise a tremendous semantic influence on primitive and immature peoples and represent a semantic factor in many primitive as well as modern taboos, are also based on such confusions of orders of abstractions.

Identification is one of the primitive characteristics which cannot be eliminated from the animal or the infant, because we have no means to communicate with them properly. It cannot be eliminated from primitive peoples as long as they preserve their languages and environments. Identification is extremely widespread among ourselves, embodied strongly in the structure of our inherited language and systems. To change that primitive state of affairs, we need special simple means, such as a $\overline{A}$-system may offer, to combat effectively this serious menace to our *s.r*. It should never be forgotten that identification is practically never dangerous in the animal world, because unaided nature plays no tricks on animals and the elimination by non-survival is very sharp. It is dangerous in the primitive stage of man, however, as it prevents the primitive man to become more civilized, but under his primitive conditions of life his dangers are not so acute. It becomes only very dangerous to the infant if not taken care of and to the modern white man in the midst of a very far advanced industrial system which affects all phases of his life, when his *s.r* are left unchanged from the ages gone by, and still remain on the infantile level.

The present $\overline{A}$-system is not only based on the complete rejection of the 'is' of identity, but every important term which has been introduced here, as well as the Structural Differential, is aimed at the elimination of these relics of the animal, the primitive man, and the infant in us.

Thus, the primitive 'mentality' does *not differentiate relations* enough; to counteract this, I introduce the *Structural Differential.* The primitive identifies; I introduce a system based on the denial of the 'is' of identity all through. The primitive man pays most attention to what

is conveyed to him through the eye and the ear; I introduce the Structural Differential which indicates to the eye the stratification of human knowledge, which represents to the eye the verbal denial of the 'is' of identity. If we identify, we do not differentiate. If we differentiate, we cannot identify; hence, the Structural Differential.

The terms used also convey similar processes. Once we have *order,* we differentiate and have orders of abstractions. Once we abstract, we eliminate 'allness', the semantic foundation for identification. Once we abstract, we abstract in different orders, and so we *order,* abolishing fanciful infinities. Once we differentiate, differentiation becomes the denial of identity. Once we discriminate between the objective and verbal levels, we learn 'silence' on the un-speakable objective levels, and so introduce a most beneficial neurological 'delay'—engage the cortex to perform its natural function. Once we discriminate between the objective and verbal levels, structure becomes the only link between the two worlds. This results in search for similarity of structure and relations, which introduces the aggregate feeling, and the individual becomes a *social being.* Once we differentiate, we discriminate between descriptions and inferences. Once we discriminate, we consider descriptions separately and so are led to *observe* the facts, and only from description of facts do we tentatively form inferences, . Finally, the consciousness of abstracting introduces the general and permanent differentiation between orders of abstractions, introduces the ordering, and so stratifications, and abolishes for good the primitive or infantile identifications. The semantic passing from the primitive man or infantile state to the adult period becomes a semantic, accomplished fact. It should be noticed that these results are accomplished by starting with primitive means, the use of the simplest terms, such as 'this *is not* this', and by the direct appeal to the primitive main receptors—the eye and the ear.

The elimination of the 'is' of identity appears as a serious task, because the *A*-system and 'logic' by which we regulate our lives, and the influence of which has been eliminated only partially from science, represent only a very scholarly formulation of the restricted primitive identification. Thus, we usually assume, following *A* disciplines, that the 'is' of identity is fundamental for the 'laws of thought', which have been formulated as follows:

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 Middle: everything must either be or not be.

It is impossible, short of a volume, to revise this 'logic' and to formulate a $\overline{A}$, ∞-valued, *non-elementalistic* semantics which would be structurally similar to the world and our nervous system; but it must be mentioned, even here, that the 'law of identity' is never applicable to processes. The 'law of excluded middle', or 'excluded third', as it is sometimes called, which gives the two-valued character to *A* 'logic', establishes, as a general principle, what represents only a limiting case and so, *as a general principle*, must be unsatisfactory. As on the objective, un-speakable levels, we deal exclusively with absolute individuals and individual situations, in the sense that they are not identical, all statements which, by necessity, represent higher order abstractions must only represent *probable* statements. Thus, we are led to ∞-valued semantics of probability, which introduces an inherent and general principle of uncertainty.

It is true that the above given 'laws of thought' can and have been expressed in other terms with many scholarly interpretations, but fundamentally the semantic state of affairs has not been altered.

From a *non-el* point of view, it is more expedient to treat the *A*-system on a similar footing with the [E]-system; namely, to consider the above 'laws of thought' as postulates which underlie that system and which express the 'laws of thought' of a given epoch and, eventually, of a race. We know other systems among the primitive peoples which follow other 'laws', in which identity plays a still more integral part of the system. Such natives reason quite well; their systems are consistent with their postulates, although these are quite incomprehensible to those who try to apply *A* postulates to them. From this point of view, we should not discuss how 'true' or 'false' the *A*-system appears, but we should simply say that, at a different epoch, other postulates seem structurally closer to our experience and appear more expedient. Such an attitude would not retard so greatly the appearance of new systems which will supersede the present $\overline{A}$-system.

In the present system, 'identification' represents a label for the semantic process of inappropriate evaluation on the un-speakable levels, or for such 'feelings', 'impulses', 'tendencies', . As in human life, we deal with many orders of abstractions, we could say in an ordinal language that identification originates *or* results in the confusion of orders of abstractions. This conclusion may assume different forms: one represented by the identification of the scientific object or the event with the ordinary object, which may be called ignorance, pathological to *man*; another, the identification of the objective levels with the verbal levels, which I call objectification; a third, the identification of descriptions with

inferences, which I call confusion of higher order abstractions. In the latter case, we should notice that inferences involve usually more intense semantic components, such as ‘opinions’, ‘beliefs’, ‘wishes’. , than descriptions. These inferences may have a definite, objective, un-speakable character and may represent, then, a semantic state which *is not* words, and so objectifications of higher order may be produced.

When we introduce the ordinal language, we should notice that under known conditions we deal with an ordered natural series; namely, events first, object next; object first, label next; description first, inferences next, . This order expresses the natural importance, giving us the natural base for evaluation and so for our natural *human s.r.* If we identify two different orders, by necessity, we evaluate them equally, which always involves errors, resulting potentially in semantic shocks. As we deal in life with an established natural order of values which can be expressed, for my purpose, by a series decreasing in value: events or scientific objects, ordinary objects, labels, descriptions, inferences. , identification results in a very curious semantic situation.

Let us assume that the scientifically established value of any level could be expressed as 100, and the value of the next as 1. With the consciousness of abstracting we could not disregard, nor identify, these values, nor forget that 100>1. If we confuse the orders of abstractions, this can be expressed as the identification in value and we have a *semantic* equation: (1) 100=100, or (2) 1=1, or any other number, say (3) 50=50.

As we deal fundamentally with a natural, directed inequality, say, 100>1, and, under some semantic pressure, ‘want’, ‘wishful thinking’, or ignorance, or lack of consciousness of abstracting, or ‘mental’ illness. , we identified the two in value, we produce in the first and third cases an *over*-evaluation on the right-hand side, and, in the second and third cases, an *under*-evaluation on the left-hand side. Thus, on the *semantic level*, any identification of *essentially different in value* different orders of abstractions, appears as the *reversal* of the natural order of evaluation, with different degrees of intensity. If the *natural* order of scientific evaluation would be 100>1, and we would evaluate through identification as 2=2, or 3=3. , 50=50. , 100=100, we would be ascribing twice, or three times, or fifty times, or a hundred times. , more *delusional* values to the right-hand side and under-evaluate the left-hand side, than the natural order of evaluation would require. Nature exhibits, in my language and in this field, an asymmetrical relation of ‘more’, or ‘less’ inaccessible to *A* procedure. Under the influence of aristotelianism, when, through identification, we ascribe to nature

delusional values, adjustment becomes very difficult, particularly under modern complex life-conditions.

The above example indicates the degrees of intensity which we find in life in the reversal of the natural order of evaluation through identification, produced by, and resulting in, the lack of consciousness of abstracting. Un-sanity, which affects practically all of us, represents the reversal of lesser intensity; the reversal of greater intensity—the more advanced 'mental' ills.

We should realize that *experimentally* we find in this field a fundamental difference in value, which, on semantic levels, can be expressed as an asymmetrical relation of 'more' or 'less', establishing some natural order. If any one should claim a natural 'identity', the burden of proof falls on him. If 'absolute sameness in all respects' cannot be found in this world, then such a notion appears as false to facts, and becomes a structural falsification, preventing sanity and adjustment. If he accepts the fundamental, natural differences in value, but prefers to assume a different order of evaluation depending on his metaphysics, be it the *elementalistic* materialism, or equally *elementalistic* idealism, the semantic results are not changed, because identification in the second case would also ascribe delusional identity to essentially different orders of abstractions. It should be noticed that the $\overline{A}$ formulation applies equally to the older different, opposite doctrines and renders them illegitimate on similar grounds.

The status of the event, or the scientific object, is slightly more complex, because the event is *described* at each date by very reliable, constantly revised and tested, *hypothetical,* structural, inferential terms, exhibiting the peculiar circularity of human knowledge. If we should treat these inferential structures, not as hypothetical, but should identify them semantically with the eventual processes on the level of the sub-microscopic event, we would have semantic disturbances of identification.

I have selected the above given order, not only for convenience and simplicity, but because of its experimental character. When we identify in values, we always exhibit in our *s.r* the reversed natural order, introduced here on space-time structural and evaluational grounds.

The above analysis represents a very rough outline, but is sufficient for my purpose. Any attentive and informed reader can carry it further as far as desired. The main point appears that different orders of abstractions exhibit different characteristics, and so any identification of entities essentially different in one or more aspects must introduce delusional semantic factors. I speak mostly about evaluation, because evaluation appears experimentally as an essential factor in all *s.r* and can be

applied even profitably in those cases of ‘mental’ illness where no definite evaluation appears, the *absence* of evaluation being a form of evaluation (*m.o*). In training, it is of utmost importance to eliminate identification entirely, which invariably appears as a delusional semantic factor. To achieve these ends, all and every available means should be employed.

When one studies carefully the older disciplines, one is amazed to learn to what an extent the recorded ‘thinkers’ rebelled against the limitations and insufficiencies of aristotelianism, which system, naturally, became antiquated a short time after its formulation. One is amazed to find that ‘everything has already been said’, and that, to a large extent, these important, separated statements were *inoperative*. It is of little importance that some ‘wise statements’ had been made by some one, somewhere, if they had no influence on the great masses of the race. The reason for this tremendous public waste of private efforts is that aristotelianism, with its further elaborations and its delusional identification, elementalism. , represents a co-ordinated *system* which moulded our *s.r*, languages, and institutions, and which influenced every phase of our lives. Under such conditions, isolated doctrines, no matter how wise, become powerless in the face of such a system, or, more correctly, a system of interlocked systems. Only a revision of the system and the tentative formulation of a $\overline{A}$-system can make many older fundamental clarifications workable, which, although known to a few specialists, appear generally unknown to the great masses and unavailable in elementary education, which alone can be generally effective. One is also amazed at the power of structurally correct terminology, and feels full of sympathy toward the primitive interpretation as the ‘magic of words’ ! Happy, structural high abstractions really have a strong creative character. Since, for instance, the principle of ‘least action’, or the ‘general principle of relativity’ (the theory of the absolute). , have been formulated, all of our structural knowledge has been recast, clarified, and we constantly hear of some remarkable applications of the new knowledge. Similarly, if it is pointed out that our main private and public difficulties are due to infantilism produced by ‘aristotelianism’, in general, and, in particular, by identification and elementalism, we at once have practical means for a revision and applications. In such a first and novel attempt over-subtlety is impossible and even not desirable. It is preferable, as well as expedient, to formulate the general outline and, thereby, draw more men into the work for the details.

For thousands of years, millions upon millions of humans have used a great deal of their nervous energy in worrying upon delusional questions, forced upon them by the pernicious ‘is’ of identity, such as:

'What *is* an object ?', 'What *is* life ?', 'What *is* hell ?', 'What *is* heaven ?', 'What is space ? 'What *is* time ?', and an endless array of such irritants. The answer, based on the human discrimination of orders of abstractions and so proper *human evaluation*, is definite, undeniable, simple, and *unique:* 'Whatever one might *say* something "*is*", *it is not.'* Whatever we might *say* belongs to the verbal level and *not* to the un-speakable, objective levels.

Let me repeat once more that the 'is' of identity forces us into semantic disturbances of wrong *evaluation.* We establish, for instance, the *identity* of the un-speakable objective level with words, which, once stated, becomes obviously false to facts. The 'is' of identity, if used as indicating 'identity' (structurally *impossible* on the objective levels), says nothing. Thus, the question, 'What *is* an object ?', may be answered, 'An object *is* an object'—a statement which says nothing. If used in definitions or classifications, such as 'Smith *is* a man', a type of statement used even in the *Principia Mathematica*, or 'A *is* B or not B', as in the formulation of the law of 'excluded third' in the two-valued *A* 'logic', it always establishes an *identity*, false to facts. The first statement expresses the *identity* of a proper name with a class name which must lead to the confusion of classes (higher order abstractions) with individuals (lower order abstractions). This confusion leads automatically to disturbed evaluation in life, because the characteristics of a class are *not* the 'same' as, nor identical with, the characteristics of the individual. I shall not analyse in detail the 'A *is* B', because, obviously, it *is not.*

How about Fido ? Fido has no science and, therefore, no 'event'. For him, the object is *not* an abstraction of some order, but '*is all*' he 'knows' and cares about. Smith not only abstracts in indefinite numbers of different orders, and does it automatically and habitually, but if he enquires he may also become *conscious of abstracting—'is not all'*, and *'this is not this'*. Now, Fido can *never* be conscious of abstracting, as his nervous system is incapable of being extended by extra-neural means, and this extension appears to be a necessary condition for the acquiring of *consciousness of abstracting.*

Although for Smith, 'This *is not* this', as illustrated on the Structural Differential, for Fido, that diagram would eventually mean 'this *is* this', the structure of his world being represented by the single disk (O_a). Fido cannot be conscious of abstracting, he *must* identify, because he 'knows' nothing of this process, and there is no means of informing him of these relations and structure.

If we *are not conscious* of abstracting, we must identify—in other words, whenever we confuse the different orders of abstractions, unavoidable if we use the 'is' of identity, we duplicate or copy the animal way of 'thinking', with similar 'emotional' responses. In the following chapters, this tragedy will be explained in detail, and it will be shown that practically all human difficulties involve this semantic factor of copying animals in our nervous reactions and evaluation as a component.

A theory which not only throws light on this serious problem, but which also gives means of replacing the old harmful *s.r* by more beneficial ones, may be useful, in spite of various temporary difficulties which are due to the old identity-reactions and the lack of familiarity with the new.

The old identity-reactions are extremely ingrained, particularly with grown-ups. Serious effort and permanent reminders are necessary to overcome them. The Structural Differential represents such a structural visual reminder, which we should keep constantly before our eyes until the pernicious disturbances of evaluation have been overcome. For Smith, the fundamental evaluation can be expressed in simple and quite primitive language—'This *is not* this'.

The above most vital semantic factors of evaluation indispensable for adjustment and sanity are conveyed to him whenever he looks at the stratification indicated on the Differential. The hanging free strings indicating the *non-abstracted* characteristics train his *s.r* to be aware of the non-allness of, and the lack of identity between, his abstractions.

Our old *s.r* were similar to Fido's; we were never *fully* conscious of abstracting. Through wrong evaluation we identified what is inherently different and longed for, or assumed some impossible 'allness' in our 'knowings'.

Practice has shown me, definitely, that to acquire these new reactions of *consciousness of abstracting* is difficult and requires 'time' and effort to accomplish, in spite of the exceptional, nearly primitive, simplicity of the means employed. The 'silence on the objective levels' sounds very innocent; yet it is extremely difficult to acquire, as it involves a complete checking of all semantic disturbances, identifications, confusions of orders of abstractions, habitual 'emotions', 'preconceived ideas'. , practically impossible without the use of the *objective* Differential to which we can point our finger and be silent, to begin with. In fact, to disregard this point, actually means failure in accomplishing the desired semantic results. At present, as far as experience has gone, the main results were achieved when a given individual had conquered this

first, simple, and obvious semantic obstacle. If the simple rules and conditions given in the present system for abolishing identification are followed persistently in the training with the Differential, a complete and very beneficial structural and semantic change in the character and 'mental' capacities of a given individual occurs, seemingly all out of proportion with the simplicity of the training. But if we consider the content of all knowledge as uniquely *structural*, and if the majority of us are semantically tied up, blocked, with antiquated, animalistic, primitive, infant-like, 'mentally'-ill and *A* structure and identity-reactions, owing to the lack of consciousness of abstracting, which we renounce *in toto* by acquiring the consciousness of abstracting, such remarkable transformation becomes intelligible.

The publication of the Structural Differential in separate, conveniently large copies has been forced upon me by experience and by various difficulties found in the re-educating of our *s.r*, without which a $\overline{A}$-system, adjustment, sanity, and all the desirable results which depend on them, are impossible.