DO SCHOOLS OF PSYCHOLOGY STILL EXIST ?

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I. Formulation of the Question

If today we were to ask a psychologist, "What is left of the great disputes which determined the image of psychology in the twenties ?" the answer would be over-shadowed by a kind of a tacit agreement. "Those disputes belong to history. Psychological schools do not exist any more. Those particular conceptions which used to be the cause of fights as bitter as those over the articles of faith became part of our general psychological knowledge. We have found that their validity is not a general one, but rather limited to certain partial areas and problems. They are, in a sense, banished to that place in the general image of psychology where they belong."

It is an odd concept of science, which is pronounced here: a specific clear-cut image of the human being and of human mental life is renounced. Psychology becomes a collection of correlations between all possible psychological facts including all physiologial, physical, geographical, sociological, etc. facts which might be found in their viciity; sometimes, it becomes a collection of mathematical formulas which define those interrelations somewhat more exactly. However, those who would hope to find in conemporary psychology something that would lead to understanding of one's self and of others would fail to find it. In reality, the situation is even worse. In his very knowledgeable essay (*Nebraska Symposium on Motivation*, 1965), J. McV. HUNT draws attenion to the very peculiar contradiction between the basic conceptions of modern psychology and those of successful progressive educational practice.

HUNT considers the present pedagogical-psychological way of thinking a schizophrenic one as far as suggestions for educational practice are concerned. With those suggesions derived from the basic concepts of modern psychology, a pedagogue may be only amused or offended. Modern psychology can offer nothing more than rewards for the desired behaviour and punishments for the undesired one by means of which certain habits are supposed to be built up and others eliminated. On the other hand, modern pedagogics maintains that these are the most dubious means of education. That means, then, that our nice concept of the unity of psychology is a thoroughly false one. Two sciences on the same subject - HUNT continues - contradictory in their basic assumptions and inferences cannot be both true at the same time. Sooner or later, one of them will have to give up. And HUNT supposes that it will be psychology rather than pedagogics.

His assumption is supported by two experiments (among others) published almost at the same time: SCHENK-DANZINGER's experiment with a human child and HARLOW's experiment with the child of the rhesus monkey. According to them it appears, first, that the question of whether or not those beings will accept the social behaviour desired in their group is decided at a stage of their development, where they cannot have any experience with pleasant or unpleasant consequences of certain behaviour in the group - which, according to the S-R-model of the

classical learning theory, is the necessary condition for the appropriation of suitable patterns of social behaviour - because they are still hanging on the breast of their mothers. Second, there has not been, as yet, a successful attempt to return an uncared-for to the path of virtue, i.e., back to the desired social behaviour, by punishing his undesired behaviour and rewarding the desired one. To this end, quite different measures are needed, as we may read - to name only the sources on hand - in the classical studies of AICHHORN, and also in the works of Alfons SIMON and H. FÜLLIGER.

However, is it really so bad with psychology? Is the S-R-scheme, including the modifications introduced by passive and active conditioning, really all that psychology has to offer for the solution of educational problems? This question is parallel with that of the unity of psychology, i.e., with whether there are really no more differing conceptions and schools in psychology. Should the answer be affirmative, it would be necessary - to cope with the knowledge and needs of the pedagogues - to invent immediately a new psychology which would correspond better to the reality of man.

Moreover, an affirmative answer would mean that psychology is no longer a young, vital, progressive science, as such sciences are characterized by continuous emerging of new problems bringing about the most contradictive assumptions or hypotheses. And it is an age-old experience that one of the most significant driving powers of progress is the effort to find among these contradictory assumptions the correct one. The notion "assumption" or "hypothesis" should not be understood here in the diluted sense of statistical lingo where it means only one of several possible outcomes of a situation, which - if it does not come true - is "rejected". This notion means something more to us : a not yet or not yet sufficiently proved assumption concerning a more or less broad scope of functional relations, in about the sense in which the notion "model" is understood today, but without the presently much advocated meaning that only a mathematical formulation makes a full-fledged model out of a hazy idea. (See also DROESLER, Congress in Vienna, Symposium on Perception.) Thus, we understand the notion "hypothesis" in the old sense, as a statement, which could be promoted to the status of a theory by sufficient experimental proof.

Of course, there will always be hypotheses of very different ranges. And only in those cases where the hypotheses had a sufficient range, a sufficiently broad area of validity, a basic significance, was it customary to speak about a "school", especially when it advocated several different, logically independent but "matching" hypotheses at the same time.

Thus, the question appears to be as follows: are there still some differences in the opinions concerning the *basic* questions in psychology ?

II. The Principles of Contemporary Psychology

Let us take, as our first example, orthodox behaviourism, as it was represented, for example, by SKINNER, because it is widely considered the psychology of the present time (also by HUNT). Analysis shows that it is built up of about a dozen principles conceived by the prominent representatives of the school as axioms or articles of faith. However, they *might* be nothing more than unproved hypotheses.

1. The Principle of Objectivity

Only data which can be observed and recorded from outside may be used in psychoogy if it is supposed to be scientific psychology. Psychology can cope with its ambition to be an empirical science only as a science of behaviour.

This is not a hypothesis concerning the facts of psychology; rather, it is a methodic rule, or, more clearly, a *prohibition* to evaluate certain data because of their lack of reliability.

2. The Principle of Passivity or of Primary Reactivity

The psycho-physical organism starts to function only because of external influence. Thus, the objective of the science of behaviour is to assess the relations between the influences *from* outside (stimuli or situations, "S") and the reactions *towards* the outside world (responses, "R"), i.e., the "S-R-relation". The reactions R, bring about a mostly new situation resp. a new kind of influence S2; thus, the elementary relation as a whole may be symbolized as S1-R-S2.

3. The Principle of Genetic Identity of Psycho-physical Systems

The hereditary or innate psychic outfit is the *same* for all men, if not for all verebrata. Therefore, for experimental research of human behaviour, doves or rats may be used.

4. The Principle of Minimum Genetic Outfit (of Tabula Rasa)

Without taking into account some elementary reflexes, there are no hereditary relations between the influences S and the reactions R. All differences in reactions R are the result of previous differences in the surroundings S (i.e., S from birth till the respective moment): *milieu theory* or environmentalism. What a person knows, he has learned during his individual existence. The capability of learning is the basic property of the psychic. Theoretical psychology is basically a theory of learning.

Principles (3) and (4) form together the doctrine called *empiricism* since the 18th century.

5. The Principles of Elementarism and Connectionism

Learning is a process of formation of connections between elementary facts, of inforcement of such connections or of weakening or extinction of connections already existing.

6. The Principle of Contiguity (Principle of Contact)

The decisive condition for any connection is time-space vicinity, if possible, repeated many times.

7. The Principle of Contingency of Arbitrariness

There is no principle of connection formation but for that of contingency; that means that chance or an arbitrary decision of the experimenter is the only decisive factor. The factual pertinency ("matching", "mutual demandedness") of the facts to be connected plays no role.

Thus, no distinction is made between the attainment of a (desired) goal on one side (e.g., of a correct solution of a problem by following, without error, some suitable proceedings) and getting a pleasant reward (a piece of candy) as a result of observing an arbitrary (prescribed by the experimenter) behaviour on the other side.

The principles (5), (6) and (7) form together the so-called "associationism". From the beginning they have also been the principal rules of empiricism (principles (3) and (4)). The new associationism differs - because of principles (1) and (2) - from the old one in that it deals with connections of situations S with reactions R (passive conditioning), rather than with connections between contents of consciousness ("ideas").

8. The Machine Principle

There are an older and a new version of the assumptions concerning the relations between situations and reactions; incidentally, they do not exclude each other.

a) The older one is the *automation model*. It is divided - according to the assumptions about the energy sources - into two subtypes:

a1 - The conduction or telephone network type: the stimulus S penetrates as an impulse through a receptor cell into the nervous system and there it proceeds - *because of the central network of connections* - to the effector organ where it leaves the organism as the reaction R.

a2 - The trigger type: the stimulus S acts - like a pressure on a push-button or a dime dropped in the slot - as a trigger which releases a ready-to-work but, until the moment of stimulation, blocked mechanism; then, the mechanism starts to work with its own energy.

b) According to the newer concept of the homeostatic or tension-reduction model (borrowed from CANNON), the stimulus S disturbs the equilibrium state of an organ system, and the reaction R restores it again. The needs are just these disturbances of equilirium or increases of tension, and the gratification of a need is just this reduction of tension. (Von BERTALANFFY calls all three variants together "the robot model of man".)

As it was shown by W. KÖHLER, the notion of homeostatic processes with their necessary feed-backs already exceeds the limitations of the classical machine principle, as the process *may affect itself* at least *at one single spot*. though by means of special conductive connections.

According to the tension-reduction model the psycho-physical system seeks under all circumstances a quiet state. This model may therefore be understood as an expresion of the *principle of quietism*: all activity is the result of disturbances and "sweet leisure" is the normal state of man.

9. The Principles of Chance and Effect

In order to understand the formation of new connections and the extinction of existng ones, as in passive ("classical" PAVLOVian) conditioning, no new principle is needed, as conditioning is but another name for association introduced for the special case in which one of the elements to be connected is an activity of the subject.

If new types of performance are needed as in trial and error learning resp. operant or instrumental conditioning, these can - as a consequence of principle 7 - only be found *by chance* and recognized as suitable and retained *by their effect*.

10. The Principle of Additivity of Personality Structure

The S-R-connections reinforced by success-failure learning are also called habits. Personality or character is the sum of habits. Any of these habits may be induced or eliminated individually without changing anything in all other habits (vegetable bed model). From these ideas of formation and elimination of habits results immediately the old, traditional, but, by modern pedagogics, rejected practice of "candy and whip". As the desirability or undesirability is determined by the educating society, the result of such an education is the maximum obtainable degree of adaptation (adjustment) or the conformity, in other words, opportunism.

11. The Principle of Reductionism

There are no autochthonous psychic dynamics. All dynamics, e.g., that of learning, of thinking, of exploring, serves the purpose of decreasing organismic tensions. He, who is not hungry, does not think.

12. In the area of social psychology, reductionism results in: The Principle of Primary Social Atomism

There are no primary social needs and desires. They are only secondarily formed by conditioning, i.e., by the realization that certain persons are exceptionally suitable tools or means for the gratification of certain organismic needs and/or for the reduction of certain organismic tensions. In this respect, there is an unanimity between behaviurism and psychoanalysis.

III. Axioms or Hypotheses?

A question arises here: are the above principles axioms, i.e., necessary presumpions of any psychology, or are they hypotheses, which - in the present state of the science - would have to permit the existence of other hypotheses and eventually - perhaps even now - give way to them; in other words, are there still opposite schools in psychology ? Thus, our question is: are the above principles necessary: And, in addition, are they sufficient ?

1. On the Principle of Objectivity

The principle of subjectivity cannot be considered an alternative to the objectivity principle. It characterizes a historical phase of psychology which continued until the introduction of behaviourism. As the objectivity principle is a prohibition, the alternative would be a psychology without this prohibition. This alternative is realized in phenomenological psychology, in "Gestalt theory" and in a number of other approaches of present psychology, and - as we shall see - it is successful.

Incidentally, behaviourism itself - even at its extremes - disregarded its own prohibition from the moment it started to speak about the "concealed", "internal", "preceding", "behaviour", meaning processes which cannot be registered by physiological means, but which are rather unequivocally identical with the acts and contents of subjective psychology. The confession of having given up a principle which played a fundamental role in the establishment declaration of behaviourism is, of course, embarrassing. However, it is even more embarrassing that this abandonment of a basic principle not only was not confessed but rather veiled by semantic manipulations, by adding to the names of these subjective facts the suffix "behaviour".

Thus, a psychology without the principle of objectivity is not only possible but rather inevitable. That is why we have a new variant of behaviourism calling itself "subjective behaviourism" (G.A. MILLER, E. GALANTER, K.H. PRIBRAM, 1960). The adjective, of course, inevitably annuls the only clear denotation of the word "Behaviourism" as a non-subjective psychology.

2. On the Principle of Primary Reactivity

Here, also, the alternative is not a concept of a psycho-physical organism characterized by exclusively spontaneous activity; the true alternative is an organism capable as well of spontaneous activity as of re-action, and, in which, in many cases the re-active behaviour patterns are only superposed on the primary spontaneous ones.

As it was proven by COGHILL, the first movements of the amblystomic larva are spontaneous because they occur at a stage of development when the receptor nerves do not yet have connections with the motor centers. The same was shown by von HOLST, e.g., that the rhythmic-locomotor fin movements of the fish are not triggered and maintained by external stimuli and that these stimuli only modify them. Behaviour in play and in exploration goes also beyond the limits of the S-R-scheme, as the opporunity for it is *looked for* even by animals and as it immediately starts anew after each conclusion, i.e., after each reduction of tension.

In this case as well, the unavoidable necessity to accept these facts is veiled by behaviourists by a notorious renaming manoeuvre: in the place of the objectively observable - that means originally unequivocally external triggering situation S (with respect to the organism) - simply a non-observable inner-organismic environment of the *motor centers* is introduced; and it appears as if the meaning of the term reaction had not been changed.

Anyway, a psychology rejecting the principle of primary reactivity is not only possible, but rather required by the facts.

3. On the Principle of Genetic Identity

The principle of genetic identity of psycho-physical systems is identical with the denial of specific inborn traits. Here also, the alternative would not be a psychology which would try to reduce all differences in the behaviour of different individuals to the differences of the predispositions, but rather a psychology that would avoid dogmatic presuppositions with regard to the contribution of genetic and environmental factors to individual differences.

As to the validity of this principle for all vertebrata, this was clearly refuted by an abundance of results of recent comparative behavioural research, obtained under pure conditions, e.g., in the Kasper-Hauser experiment.

As to the differences in human psycho-physical genetic outfit, no basic doubts exist any more. The existing controversy pertains only to the relative effects of innate outfit and of environment.

In spite of all this, behaviourism is still stuck with the principle of genetic identity. This is a result of an attitude that is even less scientific than the method of renaming, namely simply ignoring all facts not corresponding to one's principles (See K. LORENZ 1961).

Altogether, it appears that a psychology without the principle of genetic identity is not only possible, but - in the face of the existing facts - necessary.

4. On the Principle of Genetic Minimum Outfit

In the discussion of this principle it is necessary to take into account the fact that the principle of objectivity was already rejected by behaviourism itself (see above). The most significant arguments against the minimum outfit principle are derived from the subjective sphere.

In contrast to the *tabula rasa* approach, all sensual data enter

a) an *already existing* and *unchangeable* system of dimensions - not more and not less than three space- and one time-dimension. Moreover, sensual data are limited to a system of elementary qualities *already existing*. Interestingly, this system may differ between individuals in a clearly definable way according to their basic outfit (DALTONism).

b) the bulk of the sensual data is divided and grouped spontaneously in accordance with a *given* system of categories.

c) this grouping is distributed all over the three given space dimensions according to the minimum and/or optimum principles (Prägnanz-tendencies) which are inherent to the system and not modifiable by individual experience, thus only partially accord- ing to experience, but partially defying experience. (See among others, E. MACH, W. METZGER, G. KANIZSA).

The facts a), b) and c) are not consequences of experiences, but rather conditions which make it possible to acquire any experience; they are "pre-empirical".

The principle of reaction patterns inherent to the system is not to be confused with the principle of nativism. Nativism maintains only - in contrast to empiricism - that adjustment to reality is in certain aspects reached phylogenetically rather than ontogenetically. It does not mention system-specific reaction patterns at all. Moreover, there are in the case of animals, many and, in the case of men, at least several strucures originating from the above laws, without any previous experience resp. success and error learning with biologically specific releasing functions. These cannot be under- stood without admitting some analogon of the much abused "idea innata". (The English expression IRM - innate releasing mechanism, as well as the German AAM - angeborener ausloesender Mechanismus, adequately reflect these facts only in their first two words, but the word "mechanism" is misleading and should be replaced by the word "cue", in German "Merkmal").

All this means that the principle of genetic minimum outfit is not consistent with the facts. Thus, a psychology without this principle is not only possible but rather necessary.

5. On the Principles of Elementarism and Connectionism

Under the assumption that the principle of objectivity is rejected, it becomes necessary to discuss the above two principles with a view to the three following problems:

1) The problem of autonomous motions (motorics)

2) The problem of the surrounding world (situations)

3) The problem of the relation between the situation and motorics, which is the basis of behaviour.

The alternative to the statement that all larger complexes in the psychological sphere result from the connection of elementary facts is not the statement that, in the psychic life, "everything is interconnected" at the beginning and that, only in time, by means of maturation and learning processes, this universal interconnection is gradually split up and resolved (William JAMES, Hans CORNELIUS, Felix KRUEGER, Heinz WERNER).

The alternative is rather an assumption that the development and learning proesses :

a) split up and resolve existing larger complexes,

b) combine existing small complexes, which, in extreme cases, may have the character of elements, into larger complexes, and

c) that existing structures may change into others by simultaneous resolving and reombining.

In such a psychology, too, the question arises as to whether one of these processes is primary and, if this is the case, which one. Here only the following is certain:

1) in the sphere of motorics, the primary process of development is the process a), the splitting or differentiation of the originally total motion patterns which employ all available muscles, (COGHILL).

2) similarity, in establishing the structure of the surrounding world, the primary one is not the problem of combining "units" but rather that of establishing boundaries, that means, again, the problem of differentiation.

3) on the other hand - at least in the case of man - the secondary connection between situations and activities in the sense of behaviourism seems to be the more frequent or perhaps the main means of change even when, as the possibility of extinction of existing connections proves, not the only one.

6. On the Principle of Contiguity or Contact

Contact or time-space vicinity is an important but neither a sufficient nor necessary condition for the formation of connections.

It is not sufficient. The perception field is a continuum without gaps. Thus, the problem arising here may be verbalized in the following way: how is it possible that two processes A, B, taking place in an immediate contact with each other, form a unity whereas two processes B, C, taking place in an immediate contact with each other as well differentiate from each other. Apparently, other principles must be involved.

The same as has been said about the primary field differentiation may be repeated in the case of association experiments. Under completely identical time-space conditions, very different numbers of repetitions are needed in order to establish a connecion independent of the materials which are to be connected. In addition, the durability of such connections is very different. Even in this case it is not possible to speak of an exclusive effectiveness of the space-time factor.

On the other hand, the space-time vicinity is not necessary. In problem solving processes, the facts which are "required" in order to fill in a specific gap are often brought from a considerable distance. This does not always happen through an active search but frequently results immediately from the dynamics of the process.

7. On the Principle of Contingency or of Arbitrariness

What is missing in the principle of time-space vicinity for the explanation of the primary field differentiation is provided for by the principle of non-arbitrariness of the connections. The connections and differentiations occur unequivocally according to optimum and/or minimum conditions. (METZGER, 1966).

On the other hand, the animal and human nervous systems, beyend the primary field differentiation, have a very remarkable capacity to form and preserve completely arbitrary (accidental or deliberately chosen) connections, for instance, that of a person and a name or of a name and a telephone number, apparently on the grounds of a mere "togetherness".

Ceteris paribus, however, between the meaningless and meaningful connections, there exists a remarkable difference in the ease of their establishment, and in the stability of their preservation. Here, the expression "meaningful" has two denotations:

a) one of the facts may be an image of the other one (e.g., series of numbers and series of digits on a dial) or it has similar or corresponding "general properties".

b) one of the facts is "missing" in the other one - it is "required" by the other one. By its introduction, a "complete" whole of a uniform lawful structure is formed (WERTHEIMER, 1945).

The furthering effects of consistency holds according to everyday experience for the S-R-relation as well. This, naturally, is to be assessed by further systematic research.

As it appears in a more precise analysis, the multiplicity of the behavioural patterns produced during the first phase of the trial and error process is in no way, as mainained, arbitrary with regard to the sought goal. Rather, from the infinite multitude of possible behavioural patterns, a choice is made in the sense of an - at least seeming - goal relevance, i.e., in the sense of preferring those actions which promise, because of their character, the possibility of attaining the goal.

All in all, a psychology in which the principles of contiguity and contingence would be banished to a more modest place which is proper for them is possible as well as required by the facts.

8. On the Question of the Machine Character of the Relations between Situations and Reactions

As shown above, behaviourism has three different models of this relation - two strictly mechanistic, and one with dynamic properties. The mechanistic models are:

a) The conduction and switching model (telephone network type)

b) The release mechanism model (trigger type)

The quasi-dynamic one is the homeostatic model.

According to the first two models, the organism is an aggregate of mechanisms, according to the third one, an aggregate of (normally) idle subsystems with feedback connections, remaining in a state of rest unless their equilibrium is disturbed. The aggregate structure is characteristic of all three models. Further, all three models maintain that a psycho-physical organism, if not stimulated, is in a quiet state which is changed by stimulation into activity only for a limited time. In the first and second case, this reflects the fact that the psychic subsystems are considered mechanisms ready for eventual use, in the third case, that the equilibrium state of the subsystems is understood as a static equilibrium.

However, there is a fourth possibility, the most probable one (taking into account the fact that the psycho-physical processes take place in a living organism). It has two complementary assumptions:

a) Not only within the subsystems of the psycho-physical system there exists a dynamic relation between their elements. Such a relation also exists between the different subsystems themselves and between the total psycho-physical system and the rest of the organism as well. Thus, there exists a highly complicated system of highly sensitive equilibriums with a hierarchy of smaller and larger areas.

b) As to these equilibria, they are not static. Rather, in each point of the system, there constantly exists a characteristic static disequilibrium which preserves certain active processes. In physics these processes are called stationary or quasi-stationary processes. Ludwig von BERTALANFFY introduced the simple expression "steady states".

That means, however, that the organismic subsystems are constantly active. Thus, the "stimulus" S *does not cause the activity* of the organism; as a change in the conditions surrounding the organismic system, it only modifies an already existing activity. This was already supposed by E. HERING (in his *Chromology*). Wolfgang KÖHLER, proceeding from an idea of Max WERTHEIMER (1922), proved in the year 1920-22 that this supposition is in accordance with the current ideas of physics and used it in his theory of perception. Ludwig von BERTALANFFY, proceeding from biological facts and ideas, showed the basic significance of the steady state. E. von HOLST, in his theory of position reflexes, strictly proved the fact of continuous activity of the nervous system modified only by external conditions.

Static equilibriums and steady states have one characteristic in common. Both tend towards structurally defined, time-independent, final state, determined solely by the parameters of the system, and thus independent of the initial conditions. These final states are established or re-established (in case of disturbances) in different ways according to the initial conditions. Thus, the entire process achieves a character of finality withut defying natural laws.

Moreover, systems preserving a steady state have some properties which are missing in the systems tending towards a static equilibrium only. The processes which enable a system in a steady state to stay in it take materials from the surroundings of the system, and, with them, "negative enthropy". There is another fact which is connected with this which was shown by W. KÖHLER and Ludwig von BERTALANFFY in independent works. They have a capability of transition into states of higher complexity and regularity, into states of higher order, and, that means of lower enthropy. Thus, they behave *seemingly* in defiance of the second law of thermodynamics.

This holds true not only for the development of more and more highly organized beings in the course of phylogenesis and for the development of a mature organism from the fertilized ovum

(morphogenesis), but also for the productive psychic processes. Apparently, they do not take their energy from the external surroundings, like the whole organism, but rather from the psychic surrounding field, from the psychic neighboring systems, so that, in the limit case of a (sound) obsession by a (scientific, artistic, technological, organizational) problem, these neighboring systems may become deprived of energy and the respective man, as it were, "consumes himself" (W. KÖHLER). In other words, during these processes, the dynamics of the gratification of elementary needs may become more or less and, at least for a certain time, the less significant one.

This dynamic approach to the relation between the situation and reaction allows clarification not only of the facts which were already explained in another way by behaviourism, but also of two basic psychological facts which were not explained by behaviourism: finality and productivity.

The fact that this not so simple idea was founded on the basis of both objective (von BERTALANFFY, von HOLST) and subjective data (KÖHLER, WERTHEIMER) indicates that the denial of scientific usefulness of subjective data (the first principle of behaviourism) was aparently based on insufficient facts. By the way, both "subjective data" (Sign-gestalt) and finality is admitted in the "purposive behaviourism" (TOLMAN, 1932).

9. On the Theory of Learning by Success

According to the behaviouristic theory of learning, it may be ascertained only on the basis of a *success arrived at already* whether some behaviour approaches the goal or not (if there are no previously acquired mechanisms or behaviour patterns).

But, there are certain problem situations, natural or deliberately introduced, which are so accidental or so unclear that there is no other possibility in coping with them but for the classical active conditioning. However, here the question arises as to whether the conditioning may serve as a model *for all possible problem solving processes*. If this should be correct, then the basic principle would be as follows: There is no *primary finality* in the behaviour of living beings. This thesis cannot bs valid, as was demonstrated in the preceding paragraph. Wolfgang KÖHLER in his intelligence tests of anthropoids was successful in 1917 in proving the primarily goal-centered behaviour in *new* situations without any ready behavioural patterns available. As to the primary finality of the productive mental processes of man, see, first of all, Max WERTHEIMER, 1945.

The constantly reappearing assertion that the insightful solving of problems occurs "in reality" through trial and error, and that it is only transferred from exterior to interior (to imagination, or, in the behaviouristic nomenclature, on the "hidden level") has never been proven as yet and, preserving the principle of objectivity, cannot be proven at all.

Replacing overt trials by the assumption of "internal" attempts, "preceding" the external behaviour, misses the essential. First, if a person decides to go to the right around a big round table to reach his goal and not to the left, he does not need to try both possibilities in his imagination in order to find out that it takes a couple of steps less if he goes to the right. Rather, he can *observe* in his *surrounding world* that the way to the right is shorter. Second, even intelligent problem solving is often not possible without (external) attempts. However (and this is the decisive point), whereas according to learning theory, one of the attempted activities *must have already succeeded* in order to be recognized, accepted and memorized as useful, in reality, for an intelligent, primarily goal-centered activity it is characteristic that it displays choice of

attempts limited apriori by a view to the goal itself. But, moreover, in a typical case of an external attempt, as it can possibly occur even in the course of intelligent problem solving, long before success or failure are arrived at, it is possible to recognize whether or not it serves the desired use. Blind trials of any activities in the sense of the behaviouristic theory of learning are thus possible and sometimes unavoidable. But in no way are blind trials the only or even only preferred way of problem solving.

10. On the Principle of Additivity in the Development of Personality

W. KÖHLER and L. von BERTALANFFY proved half a century ago that, besides the vegetables bed model of personality as presented by the behaviouristic theory of learning, another model is possible, i.e., the model of a very complex open system with a hierarchy of interrelated subsystems, in full accordance with known natural laws. In the light of our present knowledge of the processes in living organisms, this model is even more probable. It is an important characteristic of such a system that it shows reactions which cannot be understood on the basis of a local disturbance (failure of a certain apparatus) but rather on the basis of a disturbance of the general system equilibrium, and which are therefore to be handled accordingly. The psychoanalytic concept of neuroses, with all that it has in common with S-R-psychology, is, in this respect, clearly in accord with the system theory from the very beginning.

In the framework of the new theories and models, it was possible to establish aproaches to the process of education which surpass the dubious reward-punishment model. To this, we shall return later.

11. On the Principle of Reductionism

It is a common observation that a living being sometimes stresses its psychic capailities just to get some food under unfavourable conditions, i.e., just to gratify an elementary (organismic) tension. However, the assertion that all psychic activity serves only to gratify elementary tensions and, in the psychoanalytic version, to subjectively gratify the achievement of local pleasant feelings, contradicts the facts observed not only in the case of great thinkers, scientists, inventors and organizers, but even in the case of an animal exploring new surroundings or a playing child. The tension of an unsolved problem and the restless activity which it induces in a scientist or in an artist, as well as in an interested student and in a rat transferred to unknown surroundings, on the grounds of immediate observations is to be considered as just as elementary as the tension of hunger or of the sex drive. Moreover, this may be conceived theoretically as well on the basis of the facts given in paragraph.

The question as to whether the tension resulting in a mental effort is an autochtho- nous one or whether it is induced by elementary needs, or whether both occur simulaneously, is thus not a question of the principle but rather a factual one and it can be answered only for this or that actual case. In paragraph 8, it was shown that the energy for elementary needs may be consumed by mental interests. What happens here sometimes is in a way similar to the FREUDian "sublimation". However, the dynamic relation differs. Whereas in FREUD's concept the block of normal gratification of the accumulated drive energy results in a mental activity, in the model of the open system the opposite appears. An intensive mental activity absorbes the energy available in the neighboring systems like fire absorbes the air with which it grows and preserves itself.

12. On the Principle of Primary Social Atomism

Primary social atomism is, as has been shown already, a subspecies of reductionism. Behaviourism and pychoanalysis agree here again. In the latter, it is expressed even more clearly in the description of the "Erogenous zones" which are supposed to be the main gratification areas in early infancy, in labeling the other man as an "object" of the drive, i.e., as the tool of the primary body-centered gratification, and in that it considers the organism as the main source of gratification so that other people are not indispensable even as tools.

Again, the question arises: is there an alternative ? This question can be divided in the following six sub-questions:

1) Are there some primary and, at the same time, vital social needs?

2) Have other people and beings who form groups together with the Ego really the psychological character of tools serving the Ego, or are they possibly, for a normal human being, of the same psychological relevance and of the same significance as the Ego, and, under some conditions, possibly even of greater importance ?

3) Are the social structures in the framework of which the individual exists and lives realities of the same relevance as his own Ego ?

4) Is the way in which the individual participates in his group relevant to his manner of general behaviour, first of all for his capability of normal behaviour?

5) Does there possibly exist a basic relation between the social needs or tendencies of the individual group members and those of the group as a whole?

6) Do these structures have system properties ? For instance, have they autochthonous tendencies towards transition into extreme or optimum states and towards stabilizaion in these states?

There is no doubt about the answer. The sensitivity of small children towards separation from the second year of their life, discovered by Rene SPITZ, tells all that is necessary as to question 1). Concerning the second question, from the abunance of facts pertaining to it, let us mention only the phenomenon of conformity pressure. Questions 3) and 4) were affirmatively answered long ago in the individual psychology of Alfred ADLER, and recently in certain forms of neo-psychoanalysis. See also Heinrich SCHULTE (1924). It should be stressed here that the proneness to a socially desirable behaviour, which, as was shown at the beginning, cannot be practically influenced by rewards and punishments, is based essentially on the consciousness of one's pertinence to a group as a member, accepted without reserve and enjoying full rights. Only those educational efforts which take account of this fact can be successful. Clearly affirmative for question 5) are the facts found by LEWIN and LIPPITT (1938-39) and from here, it is possible to find illustrative and provable insights even for question 6).

There is no doubt any longer that it is possible in this way to derive immediate suggestions of modern education for which classical behaviourism had no explanation.

IV. An Answer

Now, we are able to answer the question of whether there are still different schools in contemporary psychology, and the answer is a clear "Yes".