

Is Behaviorism Establishing A New Trend
In
Psychological Thought?

by

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During the past decade the behavioristic concept in Psychology has been spreading with exceeding rapidity. This is a matter to which the present writer has given much consideration and thought. Bearing in mind, however, Dr. Jeffery's sound counsel, in his Inaugural Lecture at King's College, London, wherein he stated, in his discussion of Relativity, that we owe much to Sir Isaac Newton for his clear indication of the difference existing between mathematical principles and philosophical conclusions, the present writer has sought, too, rather to criticize behavioristic conclusions, than its findings of fact.

Because of the limitations of space it has only been possible to consider several of the more fundamental aspects of the question.

The writer desires at this time to express to Professor Wright, of the University of Manitoba, his sincere gratitude for his helpful guidance and kindly assistance in the preparation of this study.

SUBJECT

I propose in this thesis to examine critically that tendency in contemporary psychological theory, known as behaviorism.

I shall first refer briefly to the historical antecedents of Behaviorism; second explain the distinctive doctrines of Behaviorism; and third attack the validity of the behavioristic theory in Psychology.

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CHAPTER I

HISTORICAL ANTECEDENTS OF BEHAVIORISM.

It has well been said that psychology, in becoming an empirical science, and in freeing itself from its metaphysical origin, is running parallel to the stages of development of the physical sciences.

But to perceive this evolution of psychology as an independent science, it would be well to go back to that time in the history of thought, when, after the commencement of the renaissance period, a definite line of investigation was being brought to fruition by the Positivist School in philosophy.

In the insistence upon the validity of the scientific method in the French Positivist Materialist School, we see in reality the completion of a definite line of thought. Locke had insisted that to invest the mind with innate powers was absurd. To him the mind was but a tabula rasa, a clean sheet upon which sense experience could write in its own myriad ways, until sensation produces memory and memory begets ideas.

This the Irish Bishop, Berkeley, feared might lead to materialism, so he set out to prove that matter does not exist except as a form of mind. Since as Locke had said that all knowledge is derived from sensation, therefore all of our knowledge of anything is merely our sensations of it and the ideas derived from all of these sensations. Hence a "thing" is merely a group of classified and interpreted sensations which we call perceptions.

This in turn gave David Hume the basis for his argument: We know the mind, said he, only as we know matter, by perception, though it be in this case, internal. We never perceive any such entity as the mind, we perceive merely separate ideas, feelings and memories. Hence the mind is not a substance that

has ideas, it is only an abstract name for a series of ideas; these feelings, perceptions and memories constitute the mind; there is no observable "something" behind the processes of thought.

Following upon this Comte could well conclude that psychology, not being a positive science had no place at all in a positivistic, mechanistic, scientific, concept of life. At the most it could be of some assistance in the study of sociology.

Well could the French materialist thus trace the history of thought. At first there is the theological stage, when all is explained by the will of the deity, next comes the metaphysical era, when all is expounded on the basis of abstractions.

Finally we come, says Comte, to that epoch when all thought is reduced to a positive science by precise observation, hypothesis and experiment and its phenomena explained through the regularities of cause and effect. Hence philosophy could not be something different from science; it was the co-ordination of all the sciences with a view to the improvement of life.

This was the natural conclusion to the thought set in motion by Locke; metaphysical abstractions entirely give way to that which was practical, positive and mechanical. Not much place was left for the psychic and the speculative.

Meanwhile, in the realm of life, the industrial revolution was taking place. This was stimulating science: astronomy, chemistry, the transformability of energy - all were playing their part in leading men's minds to science, and since philosophy itself was tending the same way, it is evident that the ground-work was being laid for the epoch-making work of Darwin, and when evolution, full-blown, was given to the world, in spite

of opposition engendered, it fell on fallow ground. As a consequence to all this preparatory thought, as it were, the entire world was talking in one decade about evolution. It advanced so rapidly into every field of intellectual endeavor that immediately thereafter it became the background of all philosophic thought.

As A. R. Wallace (1) wrote back in 1889: "We claim for Darwin that he is the Newton of natural history, and that, just so surely as that the discovery and demonstration by Newton of the law of gravitation established order in place of chaos and laid a sure foundation for all future study of the starry heavens, so surely has Darwin, by his discovery of the law of natural selection and his demonstration of the great principle of the preservation of useful variations in the struggle for life, not only thrown a flood of light on the process of development of the whole organic world, but also established a firm foundation for all future study of nature."

Summing up the work of the founders of evolution (2) we might well say that both Charles Darwin and Alfred Wallace, the English co-discoverers of natural selection were psychologists. Lamarck, their French predecessor, had recognized as one of the factors of evolution the "efforts", psychological in character, made by animals in accommodating themselves to their environment. The effects of these efforts, no less than the direct effects of environment itself upon the animal, were inherited and accumulated from generation to generation according to the well known "Lamarckian" theory. Charles Darwin recognized this principle of Lamarck as well as his view of inheritance. Although interested originally in problems relating to the animal - instinct, recognition,

emotional express and adaption - in his later work, *The Descent of Man*, he developed the full bearings of his views in their application to human faculty. Hence in it all, we must recognize the founding of a new and thoroughgoing, naturalistic psychology. The new and permanent element was the suggestion of a genetic morphology of the human faculties whose working out is one of the great tasks of the future. The mind in all its functions is a growth, its natural stages are those of the animal tree of life, its innate powers and a priori forms are inherited accretions, which have been selected and accumulated from indeterminate variations. The formal or morphological factor in our equipment, no less than the content or filling given to it by experience, is the outcome of racial adaption and selection in the physical and social conditions of man's prehistorical life. In this we see a radical racial empiricism and naturalism, not only in point of view, but in the actual mechanism as disclosed in the principle of natural selection.

Thus we see that the acceptance of the evolutionary theory has completely changed the aspect of the physical and biological sciences; their approach and modus operandi have become largely altered.

This is equally true of psychology. The psychology of the post-evolutionary period is, as has already been intimated, colored with the same pigmentation that has dyed the cloth of the other sciences. For all sciences are interdependent and psychology has since come into its own, not as a mass of speculative thought, but as a science, dealing with its own special field and having its own laboratory apparatus and skilled investigators.

If we might, for the moment, make a more general survey of the field of psychology we find (3) that since the beginning of Man's study of his own mental life, that study has taken on a twofold form, one metaphysical and the other scientific. The metaphysical interest, having perhaps religious affiliations, gradually took the form of what became known later as Rational Psychology; while the scientific interest arising out of man's intellectual nature, took the form of what has long been known as empirical psychology. These then, are the two most general conceptions of the meaning of psychology which have appeared in the history of this branch of human knowledge.

Now as we have already seen, evolution had made its appearance in the field of thought. But its popularization was perhaps most due to Herbert Spencer who succeeded not merely in stating the theory, but in applying it to every field of life. So great was his interest in it that he was moved to enunciate the formula of evolution.

Spencer (4) applied consciously and directly the principles of psychological morphology which were also implicit in Darwin. The native, *Apriori*, forms of the mind are looked upon as solidified social experience, acquired, stiffened, transmitted by heredity. To the individual they are native, but by the race they have been acquired. Innate ideas are the petrified deposits of race experience. Here is a reconciliation in principle of the empiricist and rationalist; the principle is that of racial experience, it is substituted for individual experience.

He, too, retained the associationist concept which we have hitherto considered. To him association is the cement of the mind; it binds the elements into wholes, and makes of the compositions permanent complexes and compounds. This taken together with the fact of his adherence to a strict positivist viewpoint enabled him to play

a leading part in securing the independence and scientific integrity of psychology.

Thus in making psychology's position secure as a science, the empirical attitude naturally prevailed.

As we have seen, empirical psychology is the study of the mind which is based on observation of the facts of mental life, not derived deductively from general metaphysical concepts. But empirical psychology did not become truly scientific until after it had divorced itself entirely from all metaphysical limitations and pre-suppositions. It has for its problems not the reality of ideas or the explanation of mental phenomena in terms of forces which can neither be experienced themselves nor inferred from which is experienced but it has for its problems solely the discovery of the facts of mental life, the careful descriptions, analysis and classification of those facts and the determination so far as possible of the laws of their connection.

It has well been said (5) that we may distinguish in our experiences between the act of experiencing itself and the content of the particular experience. These two aspects may further be distinguished in that the one the content may be complex, while the process, the experiencing of the content is a single act of consciousness (6). "It is often said that the content is not complex, but is simple and unitary, and that the elements into which we apparently resolve it by analysis are really new content brought into existence by our analysis. In stricter language, this really means that while the content which we apprehend is complex, and may be resolved into its elements, the apprehension or experience of the content (i.e., the process) is not itself a complex made up of the apprehensions of the different elements.

This discrimination between process and content does not mean that these are to be considered as separable kinds of experience, but rather as discriminable aspects of experience, inseparable in fact. The terms refer, not to separate experiences, but to an identical experience, considered from different points of view.

In the words of Titchener (7) the term "Mental content" refers to the qualitative aspect of experience, what kind of an experience it is, whether of a color, a tone, an emotion or an idea; whereas the term "mental act" or "process" refers to the temporal cause, or durational aspect of the experience, the experience as a momentary phase in the mental life of the individual.

Thus it came about (8) that two psychological viewpoints were developed corresponding to these aspects of experience. These became known as the structural and functional points of view. Biologically speaking they correspond to morphology, structural biology, and physiology, functional biology. Psychologists too may be interested primarily either in the structural "content" side of the science, or in its functional "process" aspect. Structural psychology considered the mind statically, as if it were a fixed thing; functional psychology treated it dynamically, as a stream of constantly changing processes.

The following may serve as an example: When we use the term perception we may be thinking either of the process of "perceiving" or the percept as a content of consciousness to be distinguished, say, from an idea or an emotion. From the functional point of view perception may be defined as the consciousness of particular material things at the time stimulating the sense organs; or the percept may be first defined, and then perception may be defined as the process of forming percepts, this being the structural

method of approach.

To further differentiate by example these viewpoints, we distinguish in memory between the process of "remembering" and the "memory-image" as content; in imagination, between the "imagining" process and the "image of imagination" as content; in thought, between the "thinking" process and the "idea" or "concept" as content of thought.

In short, structuralism views the mind entirely from the standpoint of structure. Its typical definition would be, Psychology is the science of mental states or mental contents. Its method is to take some momentary psychosis or state of consciousness, analyze it into its elementary contents, and then show how these elements combine to form the more complex contents with which experience is ordinarily concerned.

Functionalism on the other hand views the mind entirely from the standpoint of function. It would define Psychology as the science of mental processes or functions. It states that all mental processes should be thought of as different ways in which the entire psychophysical organism adjusts itself to the varying conditions of the environment according as they affect the life and well-being of the organism itself. This would deny, from their point of view, the distinction between process and content; each process is to be described in its wholeness, not analyzed into its constituent parts.

Now if this particular point of view is carried somewhat further, it is easily apparent that the concept of mental function as a mode of reaction to the environment has certain obvious biological relationships. This relationship has in turn led many of the extreme followers of this viewpoint to renounce all mental and subjective terms in their definition of the science and to prefer the statement that Psychology is the science of behavior.

We have seen that at the beginning of the present century the structuralists and the functionalists as schools of psychology practically divided the field between them. We have also seen how functionalism carried to greater lengths eventually led to a biological conception of psychology and to behaviorism. But before we consider this aspect of the question, let us consider the fate of the other school, the Structuralists, for with the development of behaviorism they became the main contenders with the Behaviorists who had practically, in importance, succeeded the Functionalists of the extreme type.

Structuralism and Introspection (9) went hand in hand. These, such as Titchener, followed the tradition established by Wilhelm Wundt. He had founded the first psychological laboratory in the world at Leipzig. At first this and like laboratories "were dedicated to the simpler possibilities of the experimental method, in studying the mental processes of human beings. Then an attempt was made to apply a combination of the experimental and introspective methods to the study of the higher thought processes, so called." In the words of Wundt (10), "Physiology views life, so to say, from the outside, but psychology from the inside".

To see the viewpoint of the Introspective-Structuralists more clearly it would be well to give Madison Bentley's summation (11) of Professor Titchener's summary of the contemporary trend in psychology before the International Congress in 1904.

"After drawing a distinction between the "psychological" and the "psychophysical" experiment (the former aiming at an introspective acquaintance with the processes and formations of a given consciousness; the latter at a numerical determination) he goes on to give the result of his survey. He finds (1) that the recent course of experimental psychology had been away from psychophysics

and toward introspection (2) that studies upon sensation, attention, perception, memory, association and action had been abundant, and (3) that the trend had been from the simple in mind toward the complex upon those fields where the structural mode is most at home; first upon sensation, affection and attention designated as the three fundamental departments of psychology, and afterwards upon the analytical side of memory, association, action and the higher intellectual processes. At the end Titchener considers the experimental problems of the non-structuralist, the man who is not enamored of introspection. Though he obviously tries to be non-partisan, he virtually drives the non-structuralist from the study of the normal, human adult. Experiment here must take the form of introspective analysis.

The concluding sentence is important in that it marks clearly the divergence now, twenty-odd years later, between the contending schools in the field of Psychology. Also to a large extent it marks the time of the divergence.

Already prior to 1898, Edward Thorndike, working under William James at Harvard (12) had done his experimental work with young chicks. This he embodied in his dissertation on "Animal Intelligence". Here he reported almost the first experimental work done upon the ability of animals like cats, dogs and chickens to learn. With the publication of this dissertation was born the science of experimental animal psychology.

In 1901 John B. Watson published his thesis on "Animal Education". It was an experimental study of the educability of the rat based on the methods of Thorndike and Small, the latter had invented the maze. Out of these studies came the whole behavioristic study.

And so there were left the two "traditions in psychology"; the one insisting that all psychological experiment "must take the form of introspective analysis", while the other emphasized the movements of muscles and the influence of glands to the exclusion and the outlawry of the word mind altogether.

CHAPTER II

STANDPOINT AND THEORY OF BEHAVIORISM

The behaviorist accepts the evolutionary theory with all its implications. In the words of Julian Huxley (13): "During the time of life's existence on this planet, there has been an increase, both in the average and far more in the upper level, of certain attributes of living things."

"In the first place there has been an increase in their size, brought about by two methods, first by the increase of size of the units of life themselves (cells, metazoan individuals, communities), secondly by their aggregation, and this has been accompanied by a (very roughly) parallel increase in the duration of life."

"Next, there has been an increase in their complexity; and this in turn depends upon the fact that a division of labor has been brought about between the parts of the organisms, each part becoming specialized for greater efficiency in the performance of some particular function."

"In the third place, there has been an increase in the harmony of these parts, and consequently in the unity of the whole. Delicate mechanism for co-ordination have been developed, and arrangements whereby one portion becomes dominant over the rest, and so a material basis for unification is given."

"In the fourth place, there has been an increase of self-regulation. The outer environment changes from month to month, from hour to hour. The more complex products of evolution are in high degree exempt from the consequences of these changes, through being the possessors of a constant internal environment which, beyond the narrowest limits, it is most difficult to alter."

"Fifthly, there has been an increase in the possibility

of bringing past experience to bear on present problems. At the base is the power of modifying normal reactions with repetition; then come some simple degrees of memory, then associative memory, as in birds and mammals, for whom most reactions are not given in the inherited constitutions, but must be learned; then rational memory in which the power of generalization liberates life from blind dependence upon the local and accidental; and finally tradition, whereby the amount of experience available to the developing race is not constituted merely by the isolated and limited experiences of its members, but by their sum. More and more of the past becomes directly operative in the present; further and further into the future can the aim of the present extend."

"Finally we conclude with a high degree of certainty that the psychical faculties, of knowing, feeling and willing, have increased in intensity, and also in their relative importance for the life of the individual organism."

Taking these conclusions of the evolutionary theory, the behaviorist draws a further conclusion that the laws applying to one specie in the chain of development necessarily apply to all alike. Since for example, birth, growth and death are common to all members of organic existence, therefore one general rule of physical as well as mental existence can be drawn; hence the only difference between the "mind" of the earthworm and the "mind" of man (in a behavioristic sense) is merely one of size, but basically, otherwise, the same. For to the behaviorist, strictly speaking, there is no separate entity such as we denominate the "mind". To him the mind is but a bodily function and hence reducible like other bodily functions to certain reflexes and instincts, and better still, to tropisms. The behaviorist maintains that to "look within" is unjustifiable; the only knowledge which we have is that which can be objectively observed.

According to Professor Watson (14): "Psychology, as the behaviorist views it, is a purely objective experimental branch of biology having as its theoretical goal the prediction and control of behavior". "The time has come when psychology must discard all reference to consciousness and devote itself entirely to the purely objective study of behavior".

Thus, for example, when a single stimulus reaches the subject, he reacts to it. The observer notes that the stimulus has brought forth a response. But supposing, as is the fact of every day experience, that in place of the single stimulus, conflicting stimuli are applied to the individual simultaneously; the behavioristic observer merely noting a lapse of time, will deny the introspectionist's assertion that this time was utilized by the individual to consciously sort out the stimuli and to work out the proper response. The behaviorist insists that (15) this "period of delay can and must be interpreted in objective terms, and not in terms of 'conscious deliberation'."

Firstly, let it be stated that to the behaviorist all human action is reducible to the tropism, reflex and instinct. So that the aforementioned delay is merely taken up with the adjustment of the conflicting stimuli. These approaching the proper reflex, the responsive action is forthcoming according to the law of Readiness. That is, given a subject ready to act, to act is desirable, not to act undesirable; conversely, given a subject unready to act, not to act is desirable, and to act is undesirable.

In his more recent work Dr. Watson applies this hypothesis to the more complicated acts of human endeavor (16). He discusses the formation of the "new" in artistic undertakings, "how the 'new' comes into being. One natural question often raised is:

How do we ever get new verbal creations, such as a poem or a brilliant essay? The answer is that we get them by manipulating words, shifting them about until a new pattern is hit upon. Since we are never twice in the same general situation when we begin to think, the word pattern will always be different. The elements are all old, that is the words that present themselves are just our standard vocabulary - it is only the arrangement that is different. Why cannot you, who are not literary, write a poem or an essay? You can use all the words the literary man uses. It is not your trade, you do not deal in words, your word manipulation is poor; the literary man's is good. He has manipulated words under the influence of emotional and practical situations of one kind or another, as you have manipulated the keys of the typewriter or a group of statistics, or wood, brass or lead. It may help us to go to manual behavior again here. How do you suppose Patou builds a new gown? Has he any 'picture in his mind' of what the gown is to look like when it is finished? He has not, or he would not waste his time making it up; he would make a rough sketch of it or he would tell his assistant how to make it. In starting upon his work of creation, remember that his organization about gowns is enormous. Everything in the mode is at his finger tips, as is everything that has been done in the past. He calls his model in, picks up a new piece of silk, throws it around her; he pulls it in here, he pulls it out there, makes it tight or loose at the waist, high or low; he makes the skirt short or long. He manipulates the material until it takes on the semblance of a dress. He has to react to it as a new creation before manipulation stops. Nothing exactly like it has ever been made before. His emotional reactions are aroused one way or another by the finished product. He may rip it off and start

over again. On the other hand, he may smile and say, "Voila, parfait!". In this case the model looks at herself in the mirror and smiles and says, "Merci, monsieur!", the other assistants say, "Magnifique!". Behold a Patou model has again come into being! But suppose a rival couturier happens to be present and Patou hears him in an aside say, "Very pretty, but is it not a little like the one he made three years ago? Is it that Patou grows a little stale? Is he not becoming too old to keep up with this rapidly shifting world of fashion?". One can believe that Patou would tear off the creation and tramp it under foot. In this case manipulation would start again. Not until the new creation aroused admiration and commendation both his own (an emotional reaction either verbalized or un verbalized), and others, would manipulation become complete (the equivalent of the rat's finding food).

"The painter plies his trade in the same way, nor can the poet boast of any other method. Perhaps the latter has just read Keats, perhaps he is just back from a moonlight walk in the garden, perhaps his beautiful fiancée has hinted just a little strongly that he has never sung her charms in sufficiently impassioned phrases. He goes to his room, the situation is set for him, the only way he can escape is to do something and the only way he can do something is to manipulate words. The touch of the pencil starts the verbal activity just as the whistle of the referee at the football games releases a group of fighting, struggling men. Naturally words expressive of the situation he is in soon flow - being in that situation he could not compose a funeral dirge nor a humorous poem. Again the situation he is in is slightly different from any other he was ever in before and therefore the pattern of his word creation will also be slightly new".

Thus the lapse of time between the subjection of

the individual to the differing and conflicting stimuli and his response thereto is explainable not with the deliberation of consciousness, but in terms of behavior, be it explicit or implicit (16a), "Explicit behavior consists in the visible activities of the larger muscles of the body, those activities which are plainly apparent to direct observation, and may be either of the immediate or delayed type; implicit behavior, which is called into being only when the response is delayed, consists in certain imperceptible (to the outside observer, at least) internal muscular activities. Where explicit behavior is delayed, the intervening time between stimulus and response is given over to implicit behavior".

Or according to Professor Frost whose psychology of behaviorism ante-dates that of Professor Watson (17): "Any simple single sesorimotor path through the nervous system from sense organ to muscle constitutes an 'alpha arc'; such an arc is always aroused into activity by a peripheral stimulus and issues in some motor act or form of behavior. Whenever an alpha arc functions so as to include the specific cortical structures, additional nerve cells are brought into activity, and such a further arc, aroused by an alpha arc rather than by a peripheral stimulus is a 'beta arc'. In brief, when a stimulus falls upon a sensitive neural mechanism, it will normally arouse an alpha arc, and this in turn may arouse a beta arc".

This basically rules out the question of mind. The five senses then do not lead to a mind; they merely, according to this theory, carry the varied stimuli to the proper muscle, gland or limb, which on the basis of reflex action and instinct, responds according to the nature inherent within it. This is the "explicit" behavior of Watson and corresponds to the "alpha arc" of Frost. If on the contrary, the source of the reflex-instinct is not so easily

approached, then "implicit" behavior (in Watson's sense) takes place, that is a finer set of nerves and muscles, whose capacity to act has perhaps made itself manifest later in the evolutionary scale, is called into action. This Frost would designate as a "beta arc", as a reflex-instinct that can be reached only by way of another.

Summarizing the concept of behavior as outlined by the Behavioristic school (17a) we find the definition to be three-fold: visceral, manual and verbal. Perforce this denies the validity of thought by definition. Thinking is largely a verbal process; occasionally expressive movements substitutable for word movements (gestures, attitudes, etc.) enter in as a part of the general stream of implicit activity. Thinking in the narrow sense where learning is involved, is a trial-and-error process wholly similar to manual trial and error. Verbal manipulation along one line is checked and stopped and a new line is begun for exactly the same reasons that such processes are checked and begun in manual learning. The thinking adjustment is achieved when the final word-grouping (sentence or judgment) or overt bodily reaction which comes as the end result of the process of thinking makes the initial stimulus to thinking inoperative or inert; that is, the final reaction, verbal or other, so changes the general state of the organism as a whole, that the original stimulating factor can no longer act upon the subject.

Herein again we see the deliberate endeavor to rule out any media. The S - R process is made final, and the purpose of psychology is merely to understand human behavior under the three-fold head to which allusion has been made.

CHAPTER III

CRITICISM OF BEHAVIORISM

Introspection has been defined (17b) as the direct observation of one's own mental processes; as the "consciousness of the self (17c). It is a reflection upon one's own experience (17d). "To experience pain is to have impressed upon one's nervous system a stimulus of a specific nature, to introspect the sensation of pain is just to set that sensation in the foreground of consciousness, to recognize especially that it is part of my experience, to make this sensation something more than a sensation or presentation, namely, an object of judgment.

"To remember is to bring into consciousness some object or event which no longer exists in my actual experience, but which is recognized as having been at some previous time an object or event in my actual experience; to introspect a memory is to examine and analyze the image aroused in my mind by the act of recollection, and so to make this image not merely something experienced but something judged to be of such a nature. What I remember, then, is the object or event itself, but what I introspect is the image of that object or event in my present consciousness; just as in perception what I perceive is the physical object itself present in my environment, but what I introspect is the experience produced in me by the presence of that object".

As one writer says (17e) "Introspection differs from external observation only in the attitude of mind which we take toward the object of observation. When we observe a physical object as a light, the question in mind, expressed or implied, is as to what the object may be in itself or in relation to other objects. When we introspect on the contrary, we ask what the experience means to us and what its relation may be to other mental processes. Exactly the same experience may, and usually does, furnish the starting point

for both".

Thus we see that as soon as we attempt to evaluate a thing objectively, the subjective attitude immediately arises: What does the object mean to me, to my ego, to myself? And when I do this, I implicitly accept the fact of my consciousness.

The behaviorist, on the contrary, would immediately deny my assumption. He would reduce my every mental process to a reflex action or to a muscular, limb or glandular act.

In order to perceive further this distinction between these two schools of contemporary thought, let us take as an example the physicist's study of the constitution of matter. As we have already intimated in an other part of our study, Berkeley had denied the existence of matter. This question was further taken up more particularly during the past half century and upwards, by the theoretical physicists, who have endeavored to show that if matter is not non-existent, the actual state of affairs is close to it. The atom, formerly regarded as the minutest form of elemental matter has been shown to be a veritable planetary system, with a bit of matter surrounded by negative charges of electricity, constantly in motion.

This example, borrowed from one of the sister sciences will suffice, for the present, to further illustrate the differences between the two schools of thought.

Granted that all these findings are correct, the next question that presents itself to us is: How were we able to attain them? What was the nexus between the mere perception of the scientific observers and the brilliant conclusions that resulted therefrom? The introspectionist calls this nexus the mind. Accepting man as an evolutionary being, he says that, nevertheless, there is this additional "something" resident in man which enables him to take the mere facts of observation in this particular instance, the study of the structure of

the atom and draw therefrom an entire cosmogony.

The behaviorist, being primarily a scientist, must accept the findings of science, as for instance, those dealing with atomic structure. He also accepts the deductions derived, say, according to the Bohr formation. But how does he account for the nexus, the connecting link between the two; that is, between the matter as it appears and its actual constitution as conceived, say by the theoretical physicists?

If we apply the theory of behaviorism we merely have the inception and conclusion of a brilliant concept. Yet how it came about, what the nexus was, what the motivating purpose was we can never know, because thorough-going behaviorism holds these issues to be invalid.

Consequently, this behavioristic assumption if accepted, rules out the concept of purposive action. Purposivity assumes the meaningfulness of an act; but if an reaction to a stimulus is merely the establishment of a neural arc, then purposivity, perforce, disappears. This is in accord with Dr. Watson's statement: (18)
"The question of meaning is an abstraction, a rationalization and a speculation serving no useful purpose. From the bystander's or behaviorist's point of view the problem never arises. We watch what the animal or human being is doing. He does what he does. His action is the meaning. Hence exhaust the concept of action and we have exhausted the concept of meaning. It is waste of effort to raise a problem of meaning apart from actions which can be actually observed."

This brings vividly to our attention, that behaviorism insists on the invalidity of all assumptions except those which are based on an observation of "actual behavior".

But this raises certain difficulties. What does Professor Watson mean with his statement as to the necessity of "exhausting the

concept of meaning?" Just how is behavior to be determined?

This question is raised by E. B. Holt of the animal objectivist, Bethe: (19) "To study the behavior of the bee is of course to put the question 'What is the bee doing?' This is a plain scientific question. Yet if we should put it thus the Bethe, his answer would probably be: 'It is doing of course a great many things; now its visual organ is stimulated and it darts towards a flower; now its olfactory organ is stimulated and it goes for a moment to rub antennae with another bee of its own hive.' 'But this is not the answer. We ask "What is the bee doing?" And we are told "now its visual ..." "now its olfactory...etc.'" With a little persistence we could probably get Bethe to say "Why the bee isn't doing anything.' Whereas an unbiased observer can see plainly enough that 'the bee is laying by honey in its home'."

Holt's question of Bethe taken together with Dr. Watson's refusal to accept the validity of meaning constitute a question as to the very validity of 'meaning' itself. If I were to exhaust all the possibilities of action, the purpose of an act would still remain unexplained. As Dr. Holt shows us in the more humble example of the bee, all questions along objective lines can only be satisfied with answers analagous to those given by him in his hypothetical discussion with Bethe. But all of these answers taken in aggregate cannot describe, in its totality, the act done. Because that necessitates not merely the objective observation, but the coupling of this with the mental concepts already possessed by mature human beings. Hence the validity of inquiring into the meaning of an act, and its purposivity cannot, in good logic, be questioned because both meaning and purposivity are needful in explaining and understanding the act itself.

This thought is further exemplified in the behaviorist's reaction to the concept of the image (20). "Imagery has been the

inner stronghold of a psychology based upon introspection. Does the inclusion of the image weaken the claims of the behaviorist? It must be admitted that it does. Take a case like that ordinarily urged. Some one suggests in words that you borrow one thousand dollars and go abroad for a year. You think over the situation, the present condition of your research problems, your debts, whether you can leave your family, etc. You are in a brown study for days trying to make up your mind. Now the train of thoughts going on in your mind, according to the upholders of the image, has no adequate behavior counterpart while it is in transit. The behaviorist observing you, might note that your appetite had departed, that you were smoking and drinking more than usual, and that you were distrait. Finally, experimental tests might show that your ability to make fine coordinations has been seriously interfered with, and that your dynamometric threshold was lowered, and so on ad in finitum. The introspectionist would say that all of these facts failed to give anything like a complete record of your 'mental content' or of the 'totality of conscious processes'. Indeed they would urge that such tests have only an analogical reference. Only direct observation of the mental states themselves by the method of introspection will ever tell whether you are grieving over past sins or are really trying to reach a decision about going abroad! If we grant this, and such an impulse is very strong, the behaviorist must content himself with this reflection: "I care not what goes on in his so-called mind; the important thing is that, given the stimulation (in this case a series of spoken words), it must produce a response or else modify responses which have already been initiated. This is the all-important thing, and I will be content with it." I.e., he contents himself with observing the initial object (stimulation) and the end object (the reaction)."

This example advanced by the dean of the behavioristic school to illustrate his thesis, specifically emphasizes, at the same time, our objection to it. In a manner speaking, this is but a modification of the example of the bee, previously referred to, while discussing the work of Bethe. In the former instance a thorough-going behaviorist could not be gotten to state directly as to the work being done by the bee, because to do so would necessitate the introduction of an element of introspection.

Similarly in this instance, the behaviorist satisfies himself with the stimulus, "I offer you a loan of a thousand dollars for the purpose of taking a trip." And with the response, "I will or will not go."

This argument seems inconsistent on its very face. It ignores a stated fact i.e., that man can speak. He can and does express himself as to his thoughts. These cannot, in good logic, be ignored because they supply us with the connecting link, with the motive, the purpose. Why does the individual desire the trip? What does he think it will accomplish for him? Why is the offer made? All of these questions, and innumerable others, can only be answered by the acceptance of introspective reasoning, which the objective observation of behavior can never supply. Then, too, we must accept his introspective reasonings, his mental struggles, the difficulties present, and why they are difficulties as far as he is concerned. We must if possible obtain his own description of his mental image of the exact state of his affairs. Only then can we properly understand the situation.

The behaviorist attempts to reduce all thought to the
S \longrightarrow R formula. That is, given the individual and the stimulus S, in this case, the offer of a loan, the response will be

R, his decision to go or not to go; this satisfies the behaviorist. But it cannot satisfy the one who is desirous of truly understanding the psychology of the situation.

Furthermore, to adopt such an attitude would be inconsistent with the current investigations of the Gestalt psychologists who are endeavoring, with what seems to be a fair measure of success, to establish the existence of mentality in apes (21). While Dr. Watson's example, if accepted would not only work a negation of the studies of the Gestalt School, but it also undertakes to deny that possibility to man!

This mechanistic outlook upon life which rules out conscious, active thought, has even further ramifications which must here be considered. If the possibility of consciousness and mentality be deleted, all that is left to man is his physical organism. In that case why should we then say that arcs and reflexes constitute the basis of behavior? Even as the physicist has not satisfied himself with the atom as the final unit of matter, should ^{not} the psychologist, representing the mechanistic view-point, seek the ultimate basis of the physical organism and reduce these arcs and reflexes to physical and chemical reactions. This has been done by Jacques Loeb.

He said: "That in the case of our inner life a physico-chemical explanation is not beyond the realm of possibility is proved by the fact that it is already possible for us to explain cases of simple manifestation of animal instinct and will on a physico-chemical basis; namely the phenomena of animal tropisms. Our wishes and hopes disappointments and sufferings, have their source in our instincts, which are comparable to the light instinct of the heliotropic animals. The need and the struggle for food, the sexual instinct with its poetry and its chain of consequences, the maternal instincts with the felicity

and the suffering caused by them, the instinct of workmanship, and some other instincts are the roots from which our inner life develops. For some of these instincts the chemical basis is at least sufficiently indicated to arouse the hope that their analysis, from the mechanistic point of view, is only a question of time." (22)

Dr. Loeb's claims are not in the least overdrawn. The constitute the natural and the inescapable conclusions forced by the acceptance of the mechanistic, non-purposive view-point of psychology as propounded by the behaviorist. Even Dr. Watson is led to say: "It is believed that the next few years will bring order out of chaos in the physico-chemical relations in the nervous system. That the organism is a machine is taken for granted in our work. The only point we insist upon is that the machine be made not too simple to perform the multitudinous demands which the behaviorist must make upon it

"No one believes more thoroughly in the complete physico-chemical nature of all response, from the simples to the most complex, than the author. We are prepared to state our belief in the view that we shall ultimately be able to trace the complete set of physico-chemical changes (quantitative energy transformations) from the moment of incidence of the stimulus to the end of the movement in the muscle. In fact it is one of the goals of behavior to assist in making this possible. But again we insist that all of the facts about response be considered. In very few cases have we reduced reactions to their simplest terms. When we have done so we shall have no quarrel with the label which is attached to them, be it that of 'simple reflex' or 'tropism'. Analysis of

reaction must end somewhere. The simple reflex is a convenient hypothesis. It may not be a final goal any more than was the atom in chemistry or than the electron of the physicist may be twenty five years from now. Both the electron and the simple reflex work well enough at present as convenient means of expressing the results of scientific analysis." (23)

This section of Dr. Watson's early work has been given in detail in order to show his reaction to the theory of tropisms. We see that in the main, he agrees with it making certain reservations not as a result of essential differences with the theory, but merely from the view-point of present practicality. But the agreement is present in all essential details, as needs it must be, because behaviorism accepts, as Dr. Watson, has so consistently intimated a thorough-going mechanistic view-point of human existence "No one believes more thoroughly in the complete physico-chemical nature of all response." This is clearly an indication of the direction in which behaviorism is tending; in denying all purposivity to human existence and in emphasizing the physico-chemical nature of all life, it must eventually conclude with Dr. Loeb that the theory of the tropism is the basic manner of accounting for all human, as well as animal, response. Why should we limit this to the simple reflex as Dr. Watson suggests? If this be the further reducible factor, then it and not a grosser term should be employed to account for the reaction of living beings. The physicist today would not be satisfied in reducing, theoretically, elements merely to their atomic form; the sub-atomic concept has entered in. Similarly, the behaviorist, being a thorough-going believer in the postulate that all of life can be accounted for on a physico-chemical basis, too, must seek out the lowest reducible factor and not to

satisfy himself with something less simple. Thus we see that while half-heartedly he accepts it, he attempts to reject it, at the same time, by implication that "at some future time it may receive full acceptance and recognition." Why should this attitude be adopted? Because the behaviorist realizes that it will eventually displace psychology altogether if adopted. In reality, however, this difficulty lying at the basis of the theory of tropisms, extends as well to the entire concept of Behaviorism.

This is, as Professor MacDougall has shown us, in disposing of Dr. Loeb's theory (24): "It is worth while to reflect that, if a monstrous visitor from another planet were to study the behavior of a colony of human beings through a powerful magnifying glass, he might well come to the conclusion that human behavior is largely, if not wholly, a matter of tropic reactions. For he would observe that when they are fatigued by a day's activity, they become negatively phototropic, seeking dark places and lying quietly there; but after a period of rest the sign of their tropism is reversed, so that they become positively phototropic and seem to seek the light. He would observe that in cold weather these queer creatures become positively thermotropic and congregate about fires and stoves; and that, when they are hungry, they become positively chemotropic towards the chemical substances which diffuse themselves from their cook-house door."

In brief, the weakness of the tropistic concept is this, that it attempts to understand apparent facts of life without having recourse to life itself. Would we understand the individual, then we must first find out his thoughts, his reasons, his rationalizations, his whys and wherefores. But if we come to regard these as being non

existent, as the behaviorist has done, then we would perforce be placed in the position of that non-earthly creature, of Professor MacDougall's story, who would try to comprehend human life without first having recourse to human speech.

This is the great difficulty with the behaviorist standpoint. We could not deny its validity as an attempted explanation of mental life, but if in endeavoring to make such explanations, it commences with a denial of the very thing it sets out to explain, then perforce we are driven to doubt its claims to a place as a school of psychological thought.

But this is not the only objection. Our contemporaries in the allied, scientific field of theoretical physics, interesting themselves in the fundamental aspects of their science, perceive a further weakness in behaviorism.

As has recently been said (25): "To behaviorism as a metaphysic one may put the following dilemma. Either physics is valid in its main lines, or it is not. If it is not, we know nothing about the movements of matter; for physics is the result of the most serious and careful study of which the human intelligence has hitherto been capable. If, on the other hand, physics is valid in its main lines, any physical process starting either inside or outside the body will, if it reaches the brain, be different if the intervening medium is different;..... On both grounds, what happens in the brain is not connected quite accurately with what happens elsewhere, and our perceptions are therefore infected with subjectivity on purely physical grounds. Even, therefore, when we assume the truth of physics, what we know most undubitably through perception is not the movements of matter, but certain events in ourselves

which are connected, in a manner not quite invariable with the movements of matter."

Thus Dr. Russell, viewing the question not from a speculative but from the physicist's point of view, realizes that even by that criterion, as well, behaviorism must fall. It is apparent that the objective reality immediately becomes subjective by reason of the medium through which the perceptual sensations pass. Hence, it necessarily follows, that when we try to understand, explain or react to anything objective to us, our introspective organism is thereupon brought into full play.

The biologist comes to the same conclusion. In the words of Professor C. J. Herrick: "Possibly the new psychology may learn to get along without consciousness but biology cannot do so. The analysis of behavior of both lower animals and men speaks unequivocally in favor of regarding consciousness as a positive biological factor in animal evolution." (26)

This is apparent even to one who is not a professional biologist.

When we compare the human young, say with a young bird, we behold an interesting differentiation. A bird of the migratory species is born here in Manitoba. Next season, if it succeeds in surviving, it will return here and engage in nest building, hatching and food-getting comparable with all the countless generations that have preceded it. And as far as we are able to ascertain, no specific training is afforded it by its parent. We conclude this to be on the basis of what we are pleased to call "instinct". It is apparently part of the native inheritance of the bird.

Now take the human young. Apart from the few barest of

necessary instincts such as food-taking, digestion, etc., it apparently, is "educable". As far as we can ascertain it is possessed of consciousness. How else can we account for human activity if not on the basis of this presupposition?

This is apparent to the biologist who looks beyond his laboratory and dissecting table. He realizes that man is "something" else besides a mere organism. How much more so should the psychologist conclude who is interested not only in man's biological structure, but also in his relationship with his fellows and his environment!

This nexus of "consciousness" which we conceive to be so essential in order to understand the human individual can of necessity be understood in many ways depending upon the individual attitude. Yet in all of these we find a distinct unity in their opposition to the behavioristic view-point.

And Professor Hans Driesch maintains (27) in addition to the foregoing, the concept of a vitalistic entelechy in order to explain the manner "in which the casual relation between the mechanical and non-mechanical world can be made intelligible without sacrificing the fact that organic life is limited by matter." We have thus seen that the behavioristic school emphasizes the oneness of the human organism explaining all of life on a purely physical basis. To that there is brought forth the objection that a vitalistic consciousness is essential to the proper understanding of life in all its phases.

Another suggestion comes to us from Jan C. Smuts who says that perhaps the division of the human organism into body and mind is erroneous, both being aspects of the one, undivided whole (28).

"Now science looks upon the physico-chemical order, upon physical nature, as it is commonly understood, as a closed system, complete in itself. The chain of physical causation is complete and

there is no need or place for anything of a non-physical character. There is a complete system of equations as between the past and the future. Effect equals cause; and there is no necessity or place for a tertium quid. Necessity and determination characterize the order of nature, the laws of thermodynamics supply a test of its working character. Where then do life and mind come in? What are their function and relation to this physical order? If they have any effect, it can only be by interfering with the inevitable chain of physical causation and thus breaking the laws of energy. If life or will or mind has any practical effect, that would mean an interference with physical causes, with the fixed and determined energy equations. But no such interference can be detected in any direction; the causal physical chain remains unbroken; the laws of energy are unalterable. We are therefore forced to the conclusion that life and mind have no real effect and are of no avail in the world. If they were, the fundamental laws of Nature would be upset. Such is the view-point of physical science.

"But, on the other hand, we are just as firmly persuaded by the most clear and unequivocal deliverances of our own consciousness that we can choose, that we can direct our attention and action to definite purposes; that our willing is effective; that we can will to perform an act, and perform it accordingly; that our bodily organs respond to the act of will in spite of all the energy equations; and that within limits we can do what we will to doAnd thus we are landed in self-contradictions. On the one hand, the unbreakable chain of natural causation and the laws of energy; on the other, our indubitable consciousness of the effectiveness of our power of free self-directed action. How is the contradiction to be overcome?"

Perhaps there is much in General Smuts' argument that is

correct. It is his assumption that inasmuch as between the claims of the strict scientist whose views preclude the acceptance of life (qua life) and consciousness, and the common-sense recognition of consciousness, there is a profound non-arbitrable difference. Hence if both views contain elements of truth, both aspects must be joined together in a synthesis of thought, making the continued separation of the human being into body and mind, impossible.

There is much in his argument that is reminiscent of Aristotle, who had, in his doctrine of matter and form, touched upon just this concept of life: "Beginning with psychology," says one text writer, "our philosopher regards the soul as the form of the body, using form in that peculiar sense as the realized end for which the animal body exists, and at the same time the efficient cause of its voluntary movements." (29)

As Aristotle has intimated and as anyone who looks into the question of 'matter' is convinced, there is a certain definite purposivity to life. It may be looked at from the matter-form view held by Aristotle, from Locke's attitude that matter can just as well not be gifted with those very qualities we attach to spirit, or from Jan Smut's restatement of the doctrine of "Holism". As we see from the foregoing, science has discovered much, and there is just as much, or perhaps infinitely more, which, with the passing of time it may, and undoubtedly will, unearth. But at the basis of it all there seems to be a purpose, a distinct directive purpose, underlying all of human existence. It is on this account, largely, that we are constrained to reject Behaviorism as a psychological trend. We do so not because we believe that it constitutes a violation of our sensibilities, but because we feel that in its assumed scientific rigidity of attitude, which if logically maintained

must perforce lead it out of the path of psychology altogether. As every other scientific endeavor, consistency must be its fundamental virtue; hence it is apparent from that which we have said before, that continuing in the way it has set for itself it will, at its best be able to explain quite fully certain physiological features of the human organism, but it cannot in the least account for ought that is psychological. It may increase our knowledge of muscles, ^{and} of nerves, of glands, but since all of psychology is tinged with introspection, it must perforce stop and rest on its laurels won in the field of biology.

An opponent of introspection and a friendly critic of behaviorism has said: "However as Koffka has pointed out, introspection alone cannot be adequate for two reasons. Firstly, there is no criterion that the observations of introspection are correct, since any two persons may not describe the subjective experience of an object, even such as a primary color, in the same terms. Secondly only those mental processes which are in the 'focus of attention' can be examined introspectively, and this limits and distorts the mental content to an unwarrantable extent. Nor is 'strict behaviorism' in better case. All it can do if it remains true to its own principles, which fortunately it has never done, is to learn new special facts about the physiology of muscles and glands. And again, this method demands a specific attitude of the observer. He is not to trust his first impression, which lets him see a clever dog searching for a hidden piece of food, or the slow deliberating glance of a chimpanzee, wanting a banana out of his reach. He does not see rage or fear or joy, but only movements of limbs and secretions." (30)

A cursory reading of the preceding will show that whereas Dr. Gordon's argument disabling the behavioristic stand-point is conclusive, where it applies to introspection it is not so. For the latter view-point does not limit itself to any set plan. It merely states that it is willing to accept any findings of trained investigators, provided always that it be given the right to test and inwardly examine the proofs brought forth to sustain any given views.

This will perhaps be more clear after a consideration of certain postulates which we regard basic to all psychological endeavor:

First: Psychology grants the existence of a material world, leaving to metaphysics the task of inquiring into the validity of this assumption.

Second: With all other sciences, psychology must postulate therefore, the existence of an external material world of space, time and objects. Psychology does not inquire into the nature of these objects, as to what they are in themselves. Psychology does ask how we come to know the outside world; it inquires as to the process by which external reality comes to be presented into consciousness.

Third: We also postulate the existence of a vitalistic consciousness.

Fourth: Hence there follows, if the preceding be accepted, the interrelation of consciousness and the material world. This naturally implies a two-fold relationship, the psycho-physiological interrelation between consciousness and its individual organism and the psychophysical interrelation between consciousness and external objects. (31)



These postulates we regard as being essential to the comprehension of that which we denominate "Psychology". In the foregoing pages we have endeavored to prove that in order to understand the mind and its workings, these fundamentals or postulates needs must be taken into active consideration. Thus any school of thought disregarding them could not fulfill our concept of psychology and its purpose. Introspection merely relying upon a study of consciousness would be insufficient, as the other elements are lacking. Behaviorism, on the other hand, in merely postulating the material world, tacitly denying the existence of consciousness and of the possibility of its interrelation with the material world, is insufficient.

A school of thought, to be truly psychological in its essential character, must take certain premises for granted: it must postulate the existence of an outer world, of the human body, the conscious mind and the purposivity of life. Without accepting these assumptions life in its manifold phases would be ununderstandable and the establishment of a permanent ethic, with certain definite verities as its base, would be impossible. Yet this is the inevitable consequence following upon the complete acceptance of the behavioristic trend in thought. On the other hand, if we realize that in all of life's complexities, there is nevertheless, a purposive human mind, then the concept of progress, of a permanent ethic with its eternal values, readily become comprehensible.

True, psychology is a science. Each searcher after the truth who endeavors to establish any of its bases must be given due recognition, and above all else, a careful hearing. But, when as the behavioristic school in examining the mind, endeavors to remove it forthwith by categorically negating its existence and by refusing

to accept certain concepts established by an ordinary understanding of the world around us, then perforce we are moved to disregard it as a trend in psychological thought. In the final analysis, psychology is the interpretation of the manner in which the mind and its consciousness subjectifies and makes apparent to the self that which it receives in the form of perpetual sensations from an objective reality.

The human mind is purposive. It reaches out far beyond itself and interprets the hidden and the mysterious of nature by bringing them into the clear light of conscious reason.

We who are borne one one dark grain of dust
Around one indistinguishable spark
Of star mist, lost in one lost feather of light,
Can by the strength of our own thought ascend
Through universe after universe, trace their growth
Through boundless time, their glory, their decay,
And, on the invisible road of law, more firm
Than granite, range through all their length and breadth,
Their height and depth, past present and to come.

(Alfred Noyes; Watchers of the Sky)

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