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GIVING UP INSTINCTS IN PSYCHOLOGY [1]

IN the present paper an attempt is made to repudiate the current views of instinct and to suggest a new interpretation of the native equipment of man on a purely objective and behavioristic basis.

INSTINCT IN MODERN PSYCHOLOGY

Although the theory of instincts is as old as the history of psychology, it is only recently that they have been applied so universally in nearly all of the fields of psychology. They were formerly conceived of as a specific faculty possessed only by brutes. People of ancient and medieval times believed that animals lived by instinct while human beings lived by reason. Even up to the middle of the nineteenth century there was little discussion of instincts in human psychology. Darwin and Spencer were, among others, responsible for first calling our attention to the rôle played by instincts in human behavior. But the traditional belief persisted and many writers still held that human instincts were irrational and undesirable forms of behavior and hence must be supplanted by reason. It was J. H. Schneider and William James who assigned to instincts a leading rôle in the determination of human motives. James asserted that man had more instincts than animals and that there was no material antagonism between instinct and reason.

Partly due to the influence of James, the rôle of human instincts turns to the other direction. Not only are instincts no longer looked upon with suspicion, but they are regarded as the mainspring of human behavior. Instinct has become a current fad in psychology. Behavior of man, origin of social institutions, religious motives, and the like—all these different human activities are to be explained in terms of instinct. Recent social unrest and the labor movement are again attributed to the failure on the part of society to satisfy the instinctive impulses. Writers on the psychology of war almost identify the war motive with the herd instinct, the instinct of pugnacity, and other allied instincts. For

[1] The writer is indebted to Professor J. V. Breitwieser of the University of California for his encouragement and assistance in writing this article.

the Freudian psychologists the sex instinct becomes the most fundamental thing in human nature.

Thousands of passages might be quoted from modern literature of psychology to show how much stress has been laid upon the significance of instinct in human behavior. But the following quotations will suffice to illustrate: "The human mind has certain innate or inherited tendencies which are the essential springs or motive powers of all thought and action, whether individual or collective, and are the bases from which the character and will of individuals and of nations are gradually developed under the guidance of the intellectual faculties."[2] "The behavior of man in the family, in business, in the state, in religion, and every other affair of life is rooted in his unlearned original equipment of instincts and capacities. All schemes of improving human life must take account of man's original nature, most of all when their aim is to counteract it."[3]

There have been some protests among psychologists against the looseness of the usage of the term "instinct." A reader of modern literature on the subject of instincts will be struck by the fact that no two psychologists will agree upon the definition of and what constitutes human instincts. In spite of all these divergencies, however, there are certain generalities that characterize the current views on instincts.

In the first place, instinct is usually defined in either one of two ways: as an innate tendency to action, or as an inherited combination of reflexes. We take Parmelee's as an illustration of the latter: "An instinct is an inherited combination of reflexes which have been integrated by the central nervous system so as to cause an external activity of the organism which usually characterizes a whole species and is usually adaptive."[4] This view seems most acceptable to the students of animal psychology and behaviorists. The former view is adopted by introspectionalists and students of social psychology who find it more satisfactory to define instincts in psychological than in biological terms. McDougall illustrates this view-point in his definition: "We may, then, define an instinct as an inherited or innate psycho-physical disposition which determines its possessor to perceive, and to pay attention to objects of a certain class, to experience an emotional excitement of a particular quality upon perceiving such an object, and to act in

[2] McDougall, *Social Psychology*, p. 29.

[3] Thorndike, *Educational Psychology*, Vol. I., p. 4.

[4] Parmelee, *The Science of Human Behavior*, p. 226.

regard to it in a particular manner, or at least, to experience an impulse to such action."[5]

In the second place, instinct is usually viewed as adaptive or teleological; that is, every instinctive performance always tends to accomplish some biological end or to adapt the organism to its environment: thus the biological purpose of anger is "the defense of the organism by removing the offending object"; that of fear is "the defense of the organism by removing it from the offending environment" and so on.[6] This view is conceded by most of the biologists and psychologists as well.

Thirdly, instinct is assumed either as fixed and stereotyped, or, as capable of modification. The latter point of view is the prevailing one in our modern literature. Psychologists have dealt with the problem of the modification of instincts in various ways: (1) Simply as an increase in perfection of the performance of instinct through practise; (2) that it takes place through changes in the original mode of response or in sensory perception; and (3) that it occurs by becoming integrated into the more complex types of responses.[7] Hunter emphasizes the point that instincts may be modified, before their first appearance, by experience of the organism or through social influence.[8] A great many psychologists maintain that instincts appear at certain periods of life and that they may be lost through disuse.

Fourth, instincts are sometimes conceived by psychologists as a specific response to a specific stimulus, or merely as a general tendency to respond to a variety of stimuli. Thorndike and many of his followers are in agreement with the former view; while McDougall, Drever, and many others, subscribe to the latter.

Three general methods are used by modern psychologists for the study of instincts. (1) The genetic method is used for the observation of the reactions of the infant. If certain reactions function from the birth on with a considerable amount of effectiveness, we assert that they are specific instincts. Nursing is perhaps the only instinct which is supposed to appear at birth. (2) In the experimental method, the experimenter observes the organism under certain controlled conditions in which there is no chance for the organism to acquire certain forms of reactions. If, in spite of such prevention of learning, the organism still can perform such

[5] *Social Psychology*, p. 29.

[6] W. H. Hunter, "The Modification of Instinct," *etc.*, in *Psychol. Rev.*, 1920, Vol. 27, p. 265.

[7] See J. R. Kantor's "Functional Interpretation of Human Instincts," *Psychol. Rev.*, 1920, Vol. 27, No. 1, p. 52.

[8] *Psychol. Rev.*, 1920, Vol. 27, pp. 255–261.

reactions, we conclude that they are specific instincts. Spalding's experiment on the flight of birds and Scott's on the social influence on the singing of birds are examples of the second method of studying instincts. (3) In the observational method, we simply observe the characteristic activities of a race. If certain activities characterize the whole species, they are regarded as instinctive. Thus, the mouse-hunting reaction is supposed to be an instinct that belongs to the cat because it is a characteristic reaction of the whole species.

Non-Existence of Specific Instincts[9]

1. We have stated that there is no general agreement among the students of instincts as to the number and kinds of instincts. Writers on the subject arbitrarily list them in accordance with their own purposes. If the writer is interested in social psychology, his list of instincts will be based on those reactions that are socially significant. If his interest is in economics or in religion his list will inevitably be a quite different one. As the purposes are varied so the classifications of instincts are unlimited and uncertain.

2. The so-called instincts are in the last analysis acquired trends rather than inherited tendencies. By an acquired trend is simply meant a habitual tendency to act in a certain way under certain conditions. In this connection it must be kept clearly in mind that a trend or tendency to action is different from an actual act; the former is simply a potential behavior which becomes an actual act when the organism is properly stimulated. A behavior tendency can only be developed as a result of the previous experience of the organism—that is, as a result of previous performance of an actual act in the presence of adequate stimuli. To assume any inborn tendency is to assume *a priori* relation between the organism and stimulating objects; for every behavior is an interaction between the organism and its surrounding objects. Such an assumption is no less objectionable than the theory of innate ideas. As a matter of fact both the theory of instinct and that of innate ideas are based on the same conception; namely the conception of *a priori* relation of the organism to external objects. If it is true that one can not have an idea of a tree before one has actually seen or learned

[9] The central position of this paper is quite different from that of Professor Knight Dunlap. (*Cf.* "Are there any Instincts?" in *J. of Abnorm. Psychol.*, 1919, Vol. 14, 307–311.) A careful examination of Professor Dunlap's article will show that he has by no means denied the existence of instinct. What he seems to have objected to is the teleological groupings of instincts which are to him unpsychological. In the present paper we attempt to deny not only the classification of instincts, but their very existence.

about a tree, it must be equally true that one can not have any food trend before one has ever eaten food.

To illustrate how our trends of action are developed let us consider the following hypothetical cases: A new-born babe, when stimulated by a certain object, displays a number of random acts. If some of these acts incidentally result in satisfaction, it is likely to be repeated on similar occasions. If, on the other hand, it results in pain, it is likely to be avoided. Through a number of trials and errors the ill-adaptive acts are eliminated, perhaps inhibited by the emphasis on the favorable reaction, and the adaptive ones are selected. If these selected acts are called forth frequently enough, by similar stimuli or "conditioning" stimuli, they tend to become habitual trends of reaction. If a child is first presented a number of wooden blocks he reacts to them in various ways: he pushes some of them away, pulls some near to him, puts some of them into his mouth, kicks them with his legs, slashes them with his arms, *etc.* In such cases, there is nothing that can be called purposive; all of them are random in character. But, if he incidentally puts some of them together and derives more pleasure from this than from other act (the reason why it gives more pleasure is probably due to certain reflex bodily effects, or it may be due to the fact that, as M. Meyer has suggested, the sensory impression in the pile of blocks is more intensive than a single block; or, it may be due to the approval and encouragement of the attendant or nurse for this particular reaction, the putting together of blocks) he is more likely to react in this way when the blocks are again presented to him on the next occasion. Now, if such a reaction is called out often enough, there is built in the child a habit of putting blocks together, and when this reaction is transferred to other objects (conditioned response) we may reasonably conclude that a rudimentary trend of construction is formed.

The habit of acquisition is generated and developed in exactly the same way. Through imitation or encouragement by persons surrounding him, the babe may form a habit of gathering his playthings together. And when this reaction is later transformed to other objects, there is bred in him a trend-of-collecting reaction.

Again, the so-called moral instinct is a result of the combined influences of various social forces. From birth on the child is subject to social impressions. These impressions and the reactions of the child tend to modify the cortical structure and leave their permanent registration in the cerebral neurons. On proper occasions these cerebral neurons are aroused and the similar reactions are likely to be reproduced by the child. But owing to his inability to recollect

the sources of these influences, he may reproduce them as if they came directly from his original nature. Our conscience is a product of various social sanctions. The authorities are first imposed upon the child from without, but gradually they are transformed into the internal authority, which gives rise to conscience. The transformation takes place so slowly and so gradually that the organism is not aware of the process. A child is repeatedly told not to do a certain thing, and that if he does do it he will be punished by some authority. He refrains from doing it at first merely because he fears the punishment, but finally it becomes habitual through frequent exercise, and he feels his duty not to do such a thing even though there be no threat of punishment for the breaking of the habit at all. In case the habit should be changed, it will involve a deep feeling of uneasiness which is commonly regarded as the awakening of conscience. Many psychologists who observe his behavior fail to trace the sources from which this habitual trend of action is developed and attribute it to an instinct.

Other trends of action are developed in the same manner. If we watch the stages of the development of human behavior closely enough, we shall not have any difficulty to trace the sources of social influences. To call an acquired trend of action an instinct is simply to confess our ignorance of the history of its development.[10] Many psychologists have denied the moral and religious trends as specific instincts. But is there any difference between these and trends such as parental care, sex, acquisition, fighting, self-display, curiosity, *etc.*? Why can we not on the same basis deny them? Whatever has been denied as an instinct is simply referred back to some other instinct. We are told that there are no religious and moral instincts as such; they are simply a combination of other instincts. But these other instincts few psychologists have ever attempted to analyze further.

3. Psychologists frequently speak of instinct in terms of purpose or teleology. Certain reactions accomplish certain ends. If these end reactions are performed without previous education, they are called instincts. Thus, if a bird has never seen other birds build a nest or has never been taught to build it, the first nest that it builds is considered as the result of an instinct. But an end reaction may involve a great number of mechanisms or subordinated acts most of which may be acquired, and yet all of these acquired mechanisms or subordinated acts may be overlooked because of interest in the end reaction, the "instinct." Walking is usually asserted to

[10] Pillsbury seems to have frankly confessed that we call those responses instincts because they can not be explained by experience. See his *Essentials of Psychology*, 1920, p. 268.

be the result of instinctive action. But how many acquired mechanisms are involved in the walking process? The movements of the trunk, of the head, of the legs and feet, hands and arms, in fact almost every part of the body, must be coordinated before walking can take place. Are we justified, then, in calling walking an instinct while the mechanisms involved in the process are acquired? How many mechanisms or other activities are involved in fighting, in sex, in parental care, *etc.?* How many of these mechanisms are not acquired? We are told that certain instincts can not function until certain mechanisms necessary for these reactions are ready. Sex instinct, they say, is not capable of functioning until the mechanisms necessary for the sexual performance have been acquired. But since these instincts have no ready-made mechanisms of their own, do we have any right to call them inherited responses? Moreover, the same acquired activities or mechanisms may be combined in different ways to produce different end reactions. The constituent acts of the fighting instinct may be identical with those involved in flights; the mouse-hunting activities of a cat may be identical with those involved in play; and do we not sometimes spend the same energy and employ the same mechanisms to construct something as to destroy something? What may sometimes seem to be unlearned activity is a new combination; its constituent acts may be as old as the life history of the organism.

That an instinct has a definite inherited neural pattern few students will deny. But such a conception can not be applied to many of the supposed instincts. General observation tends to show that the so-called instinctive reactions are very variable. Swindle has reported that even nest-building in birds, which is always supposed to be perfect and definite, involves a great deal of variability of response.[11] When we can not find any definite responses in instincts, we wonder as to the definiteness of inherited neural patterns. The teleological conception of instinct seems to reduce it to a "trend" or tendency of action, and gives up its neural correlate altogether.[12] But we have shown that the trend is acquired rather than inherited.

4. The methods used in investigating instincts are unreliable. The genetic method seems more advantageous than the others, but it has so far yielded few positive results. What it has found in the young babe is a number of random and unorganized acts. Nothing that we can call a specific instinct has been found to have ever appeared at birth, or even shortly after birth. If the student of

[11] *Amer. J. of Psychol.*, 1919, Vol. 30, pp. 173–186.

[12] *Cf.* E. C. Tolman's "Instinct and Purpose" in *Psychol. Rev.*, 1920, Vol. 27, pp. 217–233, especially page 222.

instincts limits his list to these random and unorganized acts, we shall have no particular objection to his using the term "instinct"; but we do object to the calling of any reaction an instinct if it does not appear at birth or shortly after birth; for, as we shall see, all the activities of the organism in later life are various organized reactions of elementary movements.

The general observation method is altogether inadequate; according to this, when we find a certain reaction which is characteristic of the species, it is an instinct. But a careful analysis will show that the members of the species have similar reactions, not because they have inherited the same instincts, but, rather, because they have inherited the same action system and live in a similar environment. Given an action system in a given situation the two organisms will react in identically the same way, if their past experiences and the physiological states of the moment are identically the same; change the environment and a different reaction results.

Furthermore, social influences also play a very important rôle in assimilating behavior, both in human beings and in animals. They begin to work on the organism from birth on. The results of Scott's experiments on the social influence on the songs of birds have clearly shown that the mere observation of the common types of behavior possessed by the members of the same species can not give us any warrant for the conclusion of the existence of instincts.

Those experiments on animal instincts that have yielded negative results will, of course, discredit instincts; but even those that have yielded positive results may still be subject to criticism. As we have shown, the end reaction may be performed by the organism without previous education, but its constituent acts or the mechanisms employed to produce the result are as old as the life history of the organism. There may be a new combination or a reintegration of old activities under the demand of new environment which tends to produce new result; but there is no new mechanism involved. If the experimenter can prove that birds can build nests without being taught or seeing the same activities of other birds, he must be reminded of the fact that the mechanisms and the subordinated or constituent activities which are combined to produce a complete reaction of nest building are practically the same as those that they have employed in eating, mating, fighting, flight, etc.

We may even question the validity of Spalding's experiment on the flight of birds. He confined newly hatched birds in small boxes so that they were prevented from stretching their wings and were not allowed to see the flight of other birds. These birds were not released until they reached the normal age at which other birds of

the same species began to fly. Spalding found that these birds could fly well upon being released. He thus concluded that flight was an instinct. Such a conclusion is erroneous. That the birds could fly without previous education was rather due to the maturity of action system (wings, and other flying mechanisms). Given a mature action system and given an environmental demand a definite reaction can be fairly predicted. It is no more natural than that birds with well developed flying mechanisms will fly when conditions demand such reaction. In other words, the so-called unlearned acts are not manifestation of innate responses but rather the direct effect of new situations and of the action system which possesses the possibility of such acts. The behavior of an organism must always be described in terms of its relation to the surrounding objects and its action system rather than in terms of inherited responses. The organism possesses no "preformed" reactions any more than germ cells possess a "preformed" embryo. The preconception of instinct has often betrayed the psychologist into overlooking the new environmental factors which are chiefly responsible for the supposedly unlearned acts. Instead of observing and describing the situations which call forth new acts he attempts the discovery of instincts.

This leads us to the rejection of the theory of periodical appearance of instincts. The so-called "delayed instincts" such as the sex and parental instincts, *etc.*, if they could be actually demonstrated at all, must be regarded as a result of changes in action system (for instance, changes in the structure of the sex organs at puberty which are accompanied by new intra-organic stimuli) and changes in social situations, rather than as a result of the manifestations of some mysterious forces. Any change in life situation and action system as effected by maturity of development will inevitably result in a new mode of behavior. And yet how many psychologists have not been at error in attributing it to the sudden appearance of instincts?

5. There have been at least two motives which have led the psychologist to insist on the existence of instincts and their significance in behavior. The first is the notion that every instinct has an adaptive function. Biased by the Darwinian theory of natural selection, students of psychology are apt to interpret every spontaneous reaction of the organism in terms of biological value. They argue that instincts play a very important part in the preservation of the organism and the species. These instincts, because of their adaptive value, are preserved in the race through natural selection and are handed down from generation to generation. This view is both theoretically and practically ungrounded.

In the first place, these supposed instincts might be adaptive in certain generations; but there is no guarantee that they will be adaptive in all generations and under every circumstance. Our environment is constantly changing, and new environment requires new adaptation. If instincts persist from generation to generation, they, instead of being adaptive instruments for racial or individual preservation, will become mal-adaptive in a new environment. This is especially true of those human races whose civilization has been progressing. There, the social situation changes so rapidly that no member of a new generation will have to recapitulate the old way of reaction in which their ancestors have reacted to the former environment. Should we have inherited the same instincts as our ancestors of a few thousand years ago, how awkward we would be in adapting ourselves to modern society.

In the second place, and this is more important, actual fact does not show that every spontaneous response of the young infant is adaptive. On the contrary, our observation of the behavior of the young infant seems to indicate that except those reactions that are connected with vegetative functions, most of the responses that it makes are non-adaptive, or even ill-adaptive. An infant not infrequently reacts positively to those stimuli that are harmful and negatively to those that will do no harm or are even beneficial. It will be very ridiculous to say that the young infant attempts to grasp the fire or a harmful snake, when presented to him, because such a reaction is useful to the organism. The fact that children do survive in spite of many ill-adaptive reactions that they possess, is due to the artificial elimination by society of those harmful stimuli to which they will respond positively. Children are born in a society where the stimuli are so controlled that they have little chance to exercise ill-adaptive reactions.[13] The period of infancy is a period of helplessness. This is a period that requires social protection. To say that the so-called innate responses of the young human organism have biological value is to overlook the fact that from the moment that the child is born it is taken care of by society.

6. The second motive in the discussion of instincts I wish to combat is the motive on the part of the students of instincts to conceive an instinct as an impulse which furnishes the drive or motive power that leads the organism to action. We quote McDougall again: "The human mind has certain innate or inherited tendencies which are the essential springs or motive powers of all thought and action, whether individual or collective, and are the

[13] *Cf.* Watson's *Behavior*, pp. 257–258.

bases from which the character and will of individuals and of nations are gradually developed under the guidance of the intellectual faculties."[14] "Take away these instinctive dispositions with their powerful impulses, and the organism would become incapable of activity of any kind; it would be inert and motionless like a wonderful clockwork whose main spring had been removed, or a steam engine whose fires had been drawn. These impulses are the mental forces that maintain and shape all the life of individuals and societies, and in them we are confronted with the central mystery of life and mind and will."[15] Here we are obliged to take sharp issue with McDougall and all of his followers who maintain that all the motives of human activities are derived from instincts. A general observation of child behavior will show that the activities of the new born babe are aroused by external stimuli rather than by internal "drives." Professor Woodworth has well said: "But this assumption of great inertia or inertness of the organism, though it might perhaps have a semblance of truth as applied to adults, is rather grotesque when applied to children—it is to children above all that it must be applied, since it is only young children who are limited to native tendencies, older individuals having developed derived impulses, as indicated in one of the quotations above. If anything is characteristic of children, it is that they are easily aroused to activity. Watching a well-fed and well-rested babe, as it lies kicking and throwing its arms about, cooing, looking here and there, and pricking up its ears (figuratively) at every sound, one wonders what is the nature of the powerful impulse that initiates and sustains all this activity. The fact is that the infant is responsive to a great variety of stimuli and that he is driven very largely by the stimuli that reach him from outside; though, when he is hungry, we see him driven by an inner 'powerful impulse' through a series of preparatory reactions towards the consummation of feeding. In the play of older children, also, it is difficult to find a strong incentive necessary; almost anything can be made play and then become attractive on its own account. It is true, as a general proposition, that as the individual grows up, his actions are more and more controlled by inner drives rather than by the immediately present stimuli; but even adults are less inert than McDougall seems to assume. Their activity is more easily aroused, and requires less interior motive or drive than he supposes."[16]

But in adult life the case is somewhat different. As Woodworth

[14] *Social Psychology*, p. 19.

[15] *Op. cit.*, p. 44.

[16] *Dynamic Psychol.*, pp. 64–65.

has pointed out, the actions of the human adult "are more and more controlled by inner drives." But these inner drives are by no means mystical forces suddenly bursting forth from the organism; on the contrary, they have their history and development: they are products of the constant interaction between the organism and its environment. There is every reason to believe that the motive forces of human behavior are largely shaped by society. Living in a given community one acquires certain motives of action. It is not that the social instincts tend to create society, but that the constant association tends to breed the social trends in the organism. The man is fond of living in a family not because he was born that way, but, rather, because he has lived in that way. No organism can be sociable unless it has social contact with other organisms. Isolate the child from human society as soon as it is born, would it still possess the motive forces that are common to human beings? McDougall and his followers, when they speak of these "powerful impulses" as the foundation of human behavior, forget that they are really dealing with the acquired trends rather than with instinct as they have defined it. McDougall cites from Galton the case which he regards as the display of gregarious instinct in the South African ox. He says, "The ox displays no affection for his fellows, hardly seems to notice their existence, so long as he is among the herd; if he becomes separated from the herd, he displays an extreme distress that will not let him rest until he succeeds in rejoining it, when he hastens to bury himself in the midst of it, seeking the closest possible contact with the bodies of his fellows."[17] McDougall here seems to be dealing with an acquired trend of the ox rather than its innate tendency of gregariousness, for it may be doubted if this ox would still react in the same way even if it had not lived in the herd before. In my own observation of pigeons, I have found that some pigeons, raised in isolation, like to stay aloof from their fellows even when social contact is possible.

One more illustration will make our point clearer. We quote it from C. O. Whitman on *Behavior of Pigeons*. "If a bird of one species is hatched and reared by a wholly different species, it is very apt, when fully grown up, to prefer to mate with the species under which it has been reared. For example, a male passenger-pigeon that was reared with ring-doves and had remained with that species, was ever ready, when fully grown, to mate with any ring-dove, but could never be induced to mate with one of his own species. I kept him away from ring-doves a whole season in order

[17] *Social Psychol.*, p. 84.

to see what could be accomplished in the way of getting him mated finally with his own species, but he would never make any advances to the females; whenever a ring-dove was seen or heard in the yard he was at once attentive."[18]

H. Carr and Hunter interpret this phenomenon as the modification of the mating instinct by habit before its first appearance. Such an interpretation is very far-fetched. It presupposes that the pigeon must necessarily possess an instinct to mate with the female of its own species. In our own opinion it is just as natural for it to mate with a female of another species as to mate with one of its own. In such a case no instinct of any sort has been modified. The difference lies only in the fact that this male pigeon was hatched and reared in a different environment, so that it developed a different type of sexual reaction. Whitman has also found that a male pigeon might be paired with another male, and a female with another female. Some male pigeons even refused to be paired with females, while insisting on securing sexual relation with some inanimate object or the hands of the experimenter.[19] All such cases must also be looked upon as normal. There is no sexual perversion on the part of the pigeon. For there is no sex instinct in the sense that it necessarily involves coition between two opposite sexes. The fact that mating always takes place between two opposite sexes of the same species is because the members of the same species always live in the same community where the hetero-sexual habit is normally developed. If, on the other hand, the organism is born and reared with other species, it may develop a habit of mating with the member of that species as we found in Whitman's pigeon; or, even, if it is reared in isolation, it may, in all probability, develop a homosexual or autoerotic habit. But from the standpoint of a natural scientist this involves no sexual abnormality whatever. We must remember that sexual perversion is merely a socio-moral problem. It has nothing to do with the physiological process. The point I am here driving at is this: that all our sexual appetites are the result of social stimulations. The organism possesses no ready-made reaction to the other sex, any more than it possesses innate ideas.

A Suggested Reinterpretation of Man's Native Equipment

We are now in a position to suggest a new interpretation of man's original responses which will be totally different from most of the

[18] Whitman, C. O. *The Behavior of Pigeons.* Carnegie Inst. Washington Publ., No. 257, 1919, p. 28.

[19] The same phenomena have been repeatedly reported by many observers; the writer also had the same observation.

current conceptions of instinct. On account of the lack of adequate experimental data at present, our statement will be bound to be more or less dogmatic. But in spite of this, we shall state our position in objective terms so far as possible.

1. The human infant is endowed with a great number of units of reaction. By units of reaction I mean the elementary acts out of which various coordinated activities of later life are organized. The reaction units are what we find in the child's spontaneous activities and random acts. The new born baby is characterized by being easily aroused to action; it is exceedingly active. It performs a great number of movements, such as those of the eyes, ears, arms, legs, hands, fingers, toes, face, head and trunk, in fact, every part of the body. "Stimulate him in any way and these movements become more frequent and increase in amplitude. Under the influence of intraorganic stimulation as seen in the hyperactivity of the smooth muscle contractions in hunger and thirst, and especially in the hypersecretion of the ductless glands in rage, fear and other emotional activities, these movements become much more numerous. In pain, likewise, the number of movements is increased."[20] Such spontaneous and random acts are all that we can credit to the native endowment of man.[21] These are non-specific instincts, for they are reflexes in character and involve few, if any, complex neural patterns, as opposed to most of the conventional ideas of instincts which suppose highly complex patterns.

2. With the exception of those activities that are connected with the vegetative functions the activities of the new born babe are non-adaptive in character; and while there are certain coordinate reactions such as eye coordination, the sucking reaction, *etc.* which appear at birth or shortly after birth,[22] we agree with Watson that in the young organism the random or unorganized and non-adaptive acts outnumber the coordinate and adaptive ones. The general observation of the behavior of the new born babe seems to support this view. Most of the babe's acts are aimless or non-teleological. It responds to almost any stimulus that can reach it; anything that touches its hands it grasps and puts into its mouth. When it is lying on its back it kicks with its legs and slashes with its arms. All these movements have no biological significance; likewise a great

[20] Watson: *Psychology*, p. 270.

[21] The assumption that emotions are inherited responses is very questionable. The writer expects to discuss this problem at length in the near future.

[22] It may be doubted, even, that such coordinated acts are at all genuine innate responses. Habits begin to be formed at birth, or even in the embryo. There is good reason to believe that these coordinated responses are the earliest habits of the organism.

many other reactions. The child must have gone through a number of failures before it can begin to stand, to crawl, or to walk. The psychologist has failed to observe how difficult it is for a child to coordinate its movements in order that it may be able to stand, crawl or walk, when he insists that neural patterns for these reactions are inherited.

3. These reaction units are the elements out of which all the coordinated acts of the organism are integrated. Perhaps a simple type of the integration of reaction units can be illustrated by the hand-eye coordination. Watson found that the beginning of reaching for the candle, which was presented before a babe, was between the 120th and 130th days. A somewhat more complex integration in the child is found in walking which involves the coordination of the movements of the legs, feet, head, trunk, visual organs and some other parts of the body. The next more complex organizations may be found in reading and writing. The former involves the coordination of the movement of the eyes, vocal cords, lips and tongue and other related parts. The latter involves the coordination of fingers, hands, arms and eyes, and the head and the trunk which maintain the general position of the body. In playing piano, the coordination is still more complex than any one mentioned above. Here we have the movements of the legs, feet, hands, arms, general bodily position and the auditory and visual organs, and in case singing is accompanied we have to add the movements of vocal apparatus, lips, and tongue—in fact, the implicit vocal movements are involved even when the player is singing silently.

Not only the elementary acts can be integrated into a single act, but the organized acts are also capable of various combinations. A single case will be sufficient to illustrate the point. A normal child of six or seven years old has a considerable degree of coordination in walking and in the movements of various other parts of the organism. But if he is to be taught the dancing lesson, a new coordination is needed. The steps of his feet must be coordinated with his hearing, the movement of the body must follow his steps and so on. Such an act is not a direct integration from the original units of reaction but a recoordination, the elements of which are more or less coordinated in themselves.

4. There are several characteristics in the integration of the reaction units into coordinated acts which must be emphasized here.

First. The process of the integration always involves selection and elimination. We have stated that most of the acts of the new born infant are non-adaptive. What we mean to say is that in the early childhood there are few appropriate movements. The appro-

priate acts of the child can only be secured through a number of trials and errors. Natural selection is always operating in the random acts of the babe. But there is another factor of selection which is more significant from the standpoint of education. It is a selection controlled by society. A child is very likely to make indiscriminate reactions. We have noted that the child not infrequently responds positively to harmful stimuli and that in order to protect the child from being injured by such reactions, society removes the stimuli that will call forth ill-adaptive reactions. The educational process in one sense is to control the environment in such a way as to eliminate the possibility of wrong reactions of the child.

In this connection, there is another important function of education. We saw that the process of acquiring adaptive reaction by trial and error or through natural selection is very slow and laborious. In primitive society where life was very simple, where the demands of society upon the individual for right actions were far less complicated than they are now, we might leave him to adjust himself without the assistance of education. But since the modern social structure is so complex and the social demands are so great a child, if he is left alone, may fail to fulfill the social requirements. Furthermore, if the learning process is not shortened, the time and energy of the individual will not be sufficient for him to acquire all the necessary social adjustments. Herein lies the fundamental justification for education. The fundamental motive of education is to assist the individual to adapt himself to society in a most economical and effective way. Through instruction, useless and ill-adaptive movements in learning may be avoided and the appropriate acts be quickly performed. The chief function of education, in other words, is time-economy and labor-saving; the main problem in educational psychology is the problem of efficiency of learning.

Second. If the stimuli that have aroused certain responses in the organism appear so often that the bond between the stimuli and responses becomes fixed, we have specialized responses or what is ordinarily called habitualized acts. Our habitual acts are stereotyped acts that have been integrated from the elementary acts. In general, the oftener the same stimuli appear the more specialized the reaction to these stimuli becomes and the more rigid and fixed is the habit.

Third. On the other hand, on account of the demands of novel environment, our habitualized activities may be reorganized so that the organism will be enabled to adjust itself to the new situation. It is only a truism to say that there are different possibilities of reorganization of early acquired habits in different individuals.

There are individuals whose habits are so fixed and stereotyped that they are almost incapable of reorganization of any sort. Individuals of this kind often fail to adapt themselves to novel environment. On the other hand, there are individuals whose habits are so plastic that they are easily reintegrated under the demands of new situation. On the whole, the plasticity of habits depends on the richness of experience of the organism. The more experience or the more variety of stimuli it has, the less fixed and rigid are its organized reactions.

This leads us to an emphasis on the importance of liberal education. Liberal education means from the standpoint of psychology that kind of education which provides great varieties of experience for the individual in such a way as to enable him to adapt himself readily to novel situations. The training of adaptability is more important than that of specialization in education. I do not mean to minimize the importance of specialization, but in modern education there is great danger in over-emphasizing this phase of training. Vocational education is often secured at the expense of general education. We must not forget that the more specialized the individual is, the less adaptive to novel environment will he become.

Fourth. (And this is simply to restate the chief element of our contention in this paper.) The type of integration of the elementary acts into complex reaction systems largely depends on the nature of the environment. Our daily acts are organized as a result of environmental demands; our trends of actions are products of the constant interplay between the organism and environment. If a man is born and raised in a highly civilized community, he may acquire a powerful trend of parental care which he extends to humanity as a whole and even to animals. On the other hand, if he is brought up in a savage tribe where the custom of cannibalism prevails, he may acquire a habit of taking pleasure in killing. At times the same native equipment may be developed into compassion, while at others it may be developed into cruelty. The tender-hearted Buddha differs from a bloodsucker not so much in his native constitution as in his acquired characteristics. This principle also holds true of animals. The passenger pigeon when hatched and reared with the ring-doves will refuse to mate with the female of its own species. The goslings, when reared away from water will refuse to go to water. Chickens, when hatched and reared in the absence of a hen, may follow any moving object and refuse to follow any hen. We need not assume that the instincts wane or are modified in order to explain such phenomena. The theories of waning and modification of instincts have no scientific ground whatever.

Psychologists have often been misled by the assumption that certain reactions which are common to the species must belong to the category of instinct while deviation from any such common reactions must be regarded as the waning or modification of instinct. If it is realized that the organism possesses no specific instincts whatever and that different types of behavior simply result from different environmental demands, these two theories will at once become superfluous.

The fact that the nature of environment determines the organization of reaction systems accounts for both social solidarity and individual differences in occupations and in types of behavior.[23] In every society there are certain kinds of social stimulation that are common to all members of the group, a fact which makes similar reactions among the members possible. On the other hand social influences are so complicated and so varied that no two individuals will happen to live in an identical situation. Different experiences and different training tend to produce individuality.

There are more possibilities for the organizations of the original units of reaction into a complex system, than society can supply stimuli. Man possesses more latent potentialities than he has actually realized. On the other hand, society furnishes more opportunities for individual development than the organism can make use of. One individual can not at the same time be a politician, a scientist, an educator, a poet, carpenter, a miner and fruit raiser. When the development of the individual reaches its limit, it becomes very hard for him to acquire any new organization of reaction systems. Everyone realizes how difficult it is for an individual to change his vocation or to acquire a new skill after the age of thirty or so, in spite of the fact that he possesses all these possibilities.

Fifth. That the original units of reaction are the elements out of which our organized activities are directly developed is more true of children than of adults. In adults the habit formation consists more in the reintegration of the old habits than in the direct integration of the original elementary acts. The development of human behavior is from simple to complex, from unorganized to organized. Human reaction systems are always organized in hierarchies; each new habit utilizes some of the previously formed habits; we build our more complex organizations of reaction system upon the simpler ones. In other words, the units of the acquisition of new habits in later life are not the original units

[23] Individual differences that are due to heredity are simply the differences in the degree of latent possibilities in the integration of the elementary acts into various complex reaction systems. The theory of native capacities as advocated by Woodworth, Thorndike and others is as untenable as that of instincts.

of reaction but the earlier acquired habits. We never learn how to walk in order to learn how to dance, we never learn how to coordinate the movements of eyes and hand in order to learn how to use a typewriter, for all such simpler coordinations have been acquired in early childhood; the only thing we have to do in learning these things, to repeat, is to organize these simpler ones into a more complex system. Watson says that it takes the child a longer time to learn to drive a nail well than it takes an adult engineer to build an airplane. This is literally true, for in the child the systems of reaction are so simple that little can be utilized in new learning, while in the adult highly complex systems of organization have been achieved that can be made use of in a new acquisition.

The development of human behavior is essentially the increase of complexity in the organization of reaction systems. This fact has been overlooked by most geneticists. Genetic psychology in the past has been largely devoted to the study of the periodical appearance of instincts. The geneticists have failed to analyze the complex forms of behavior into their simple elements. To be sure, they investigate the different stages of development. But they have seldom scrutinized how each stage is related to its previous and subsequent stages. They have occasionally noticed the spontaneous and random movements in the new-born babe, but have never realized that all the complex activities in the adult can be analyzed into such simple acts; they tell us rightly or wrongly that at certain ages the child displays certain types of behavior, but how they come about they have failed to investigate altogether. Such failure is, of course, partly due to lack of adequate experimentation but more largely to the preconceptions of instinct, especially that of the periodicity of instincts. Indeed, genetic psychology in the past has practically failed and the need to start it all over again on a purely objective and experimental basis is now imperative. To do so we must first discard all presumptions of instinct altogether and study the development of behavior in terms of increase in complexity of the organization of reaction systems as they are integrated in various ways either directly or indirectly from the original units of reaction. And, further, greater attention should be paid to the study of environmental factors which affect the organization of the reaction system; we should look to the specific stimuli or situation rather than the instincts for the explanation of the development of behavior. It is no small handicap to the genuine understanding of the development of behavior to assume instincts existing as specific faculties in the organism.

5. There are a number of elementary acts that are not integrated with other reaction systems and remain relatively independent acts throughout the life of the organism. They may respond to stimuli independently of other organized reactions which concern the organism as a whole. Such acts belong in the categories of reflexes, such as knee-jerk, winking, sneezing, yawning, etc.

By way of conclusion, we may state that such a theory we have so far advanced is not an altogether new one. The importance of the spontaneous and random activities of the young organism has been duly emphasized by Professor Watson.[24] But we can not agree with him that, besides the activities of this sort, there is another group of innate reactions or instincts. In fact, the results of his investigation on the behavior of the new-born babe do not indicate any appearance of specific instincts, except a vast number of random movements. Having failed in discovering specific instincts in the young babe, he is forced to accept the theory of temporal order of appearance of instincts which has not any scientific proof and has been rejected altogether in this paper. Further, he has done violence to his own definition of instinct when he accepts many of the conventionally listed instincts. For, as we have seen, the responses of these instincts involve a great deal of variability and it is very hard to find in them any definite inherited neural patterns which is his essential conception of instinct. We are, therefore, obliged to repudiate all his theories of instinct. For we have found that the random or unorganized acts in the young babe are sufficient to account for all complex and organized forms of behavior in adults, and that it is not only superfluous but harmful to our genuine understanding of human behavior to assume the existence of any specific instinct.

Note. This article was placed in the hand of the Editor in February, 1921. After several months an article, entitled "The Misuse of Instinct in Social Sciences," by L. L. Bernard, appeared in the March number of *Psychological Review* (1921). While my position regarding instinct is different from that of Bernard there is some relation between these two articles. I wish to call attention to the fact that my article was accepted by the Editor before I had access to Bernard's article.

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CLASSICISM AS AN EVANGEL

"THE knowledge of what is possible is the beginning of happiness." This sentence when reflected upon will start in different minds trains of thought resulting in contrary conclusions:

[24] See *Behavior*, Chaps. 4 and 6, and *Psychology*, Chaps. 7 and 8.