

A CRITICISM OF CONTEMPORARY EDUCATIONAL THEORY IN THE  
LIGHT OF GESTALT PSYCHOLOGY.

By

F. W. Simms.

BEING A THESIS SUBMITTED TO THE UNIVERSITY OF MANITOBA  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE  
DEGREE OF MASTER OF ARTS.

April, 1932.

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PREFACE.

-I-

During the period covered by the last half of the 19th century and the interval since 1900, there has been an unprecedented interest in questions of social import. The rapid change in the methods of industrial production throughout the western world has forced new situations to the forefront. The catastrophe of 1914-18 served to emphasize the significance of the chaotic conditions under which humanity was attempting to progress. Post-war development with its ensuing economic instability has aggravated a situation already strained. In the realm of individual conduct former standards have been seriously questioned. The War period had called for an effort of cooperative action hitherto unknown and successful accomplishment had fanned high the hope that long cherished Social Ideals were to be realized.

The course of development has been so rapid that the Student of Social Problems has been hard pressed to keep abreast of the kaleidoscopic changes. In no other phase of human activity has the inadequacy of former conceptions become more apparent than in our Educational Procedure. This is the more to be regretted, since it is truer today than ever, that the sanest way of advance lies along the path of Education.

The march of time is making it increasingly evident that the Educationalist must critically evaluate his ideals in the light of recent world advance. He must be constantly on his guard lest the methods he employs fail to utilize

to the full, such discoveries as have a bearing on his own problems. The underlying assumptions of the Psychology on which current Educational Practice is based are today being widely questioned. There is a growing body of opinion which feels that our schools have fallen short of their opportunities and that the failure has been due to our questionable principles rather than to lack of energy in application.

Those of my readers who are conversant with current teaching methods in the Elementary Schools will appreciate the wide divergence which separates Theory and Practice. In advanced circles of thought it is assumed that the "pupil" is the prime factor concerned and that the "material" to be fashioned is unique, yet the variation in the methods that are actually employed in the class-room reflects the lack of a true understanding of the manner in which learning proceeds.

It is the aim of this Thesis to set forth a threefold point of view:

(I) That the adoption of the principles of "Gestalt Theory" will supply a long felt need and a more or less sufficient basis for the harmonizing of Theory and Practice.

(II) That an adequate appreciation of the Import of "Gestalt Theory" demands a comprehensive review. We shall, therefore, supplement the primary argument by showing that life is creative and unique. We shall endeavor to establish the viewpoint that the context of individual life and racial history is essentially one of unity. We shall venture to

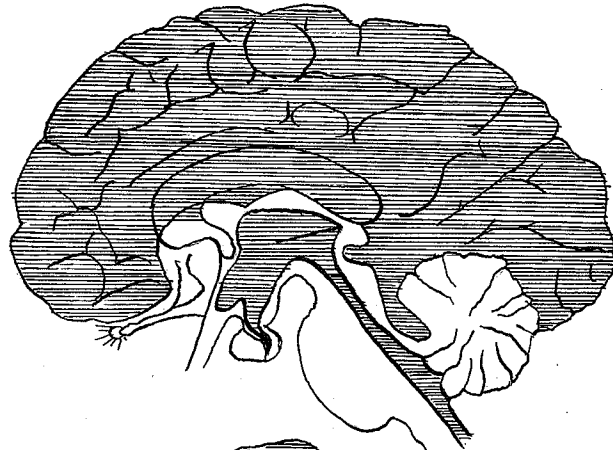
draw this conclusion after we have considered the relative place of "Hermic" and "Mnemic" factors and have pointed out the part which "configuration" plays in both Memory and in Learning. The position will be taken that the unitary nature of all life is exemplified in a progressive series of life forms, extending from the lowliest amoeba to civilized man- and from the weakest "mnemic" traces to consciously directed memory.

(III). Having adopted this stand, we shall proceed to point out a number of practical implications that have significance for educational method. Special attention will be given to the role of "Mind" as the outstanding factor making for a complete adaptation.

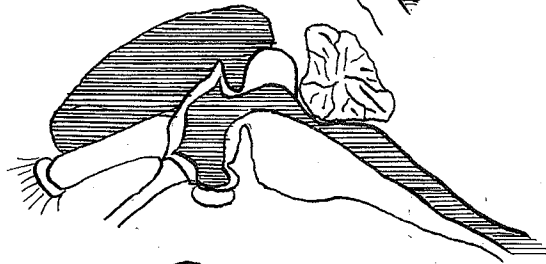
I wish to acknowledge my debt of gratitude to Dr. H. W. Wright for his kindly counsel and sympathy in this undertaking.

To my wife "Edith" I am greatly indebted. Not only has her keen appreciation of the problem given an opportunity for discussion, but throughout she has assumed the burden of detail and arrangement in its entirety.

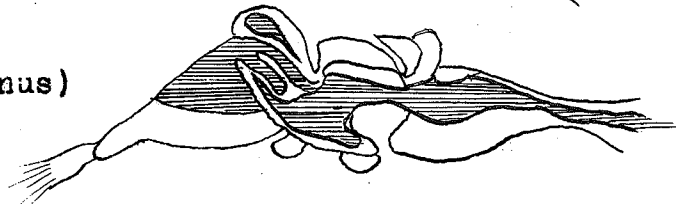
Man (Homo)



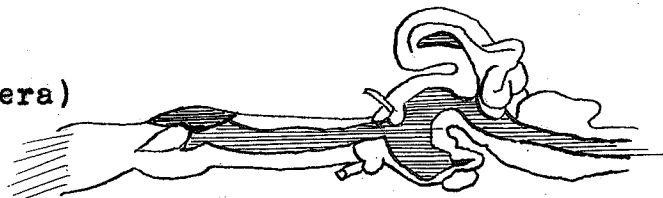
Rabbit (Lepus)



Lizard (Varanus)



Shark (Chimaera)



"Old" Brain, Red: "New Brain, Black.

(After Edinger)

(Adapted from Koffka "The Growth of the Mind" )

PART I. INTRODUCTION.

"Every scheme of Education," says T. Percy Nunn "being at bottom, a practical philosophy, necessarily touches life at every point. Hence any educational aims which are concrete enough to give definite guidance are correlative to ideals of life- and, as ideals of life are eternally at variance, their conflict will be reflected in educational theories."(I).

The existing state of affairs is here nicely summed up and there will be no gainsaying the fact that educational theory and practice have not been developed along consistent lines but have been determined by the divergent ideals which were prevalent at their inception.

The Idealism of Hegel culminated in the subordination of the rights of the individual to that of the authority of the state. The western world has since furnished numerous examples of such a warping of an entire Educational System to serve National Interests. Immediately following the Great War, the centralization of authority which had prevailed, gave way to a more wholesome individualism which seems destined to persist, although the advent of any catastrophe of similar magnitude in the future will probably witness a recurrence of emphasis on the Sovereignty of the State.

Educational theory and practice are primarily concerned with conditions as they exist. The dominance of any particular aim or ideal must give way to a well grounded scheme of advance laid down on broad lines. No matter what theoretical difficulties may be interposed, it is apparent that the individual is the entity with which the educator

(I)"Education, its Data and First Principles. T.Percy Nunn.p.2.

deals and that the individual has social relationships which are requisite for all development, other than that of a rudimentary sort. Professor A.N.Whitehead aptly illustrates this twofold point of view when, speaking of the aims of education he says;

"We have to remember that the valuable intellectual development is self-development, and that it mostly takes place between the ages of sixteen and thirty. As to training, the most important part is given by mothers before the age of twelve;"

and he quotes the reply of Archbishop Temple to one who expressed surprise at the success in after-life of a man, who as a boy at Rugby had been somewhat undistinguished:

"It is not what they are at eighteen, it is what they become afterwards that matters" (1)

The development which takes place in full blown adult life is dependent for its fruition on the contact with the social environment. It is true as the great Blackstone has said that "a nation is a collective body of individuals united for a common purpose and acting together as one man" and his statement well expresses the unitary nature of every social body. The composite nature of Society implies cooperative thought and action on the part of its individual units. It is essentially through cooperation that social progress is made and while many factors incidentally make toward unitary action yet educative influence is the positively directed agency which makes possible a shortcut toward the goal. Man comes into his own when through contact with his surroundings he builds on the basis of

(1). "Aims of Education", A.N.Whitehead. p.1.

his inheritance. Well directed educational training is a real organizing agent in furthering his self-development. An interesting report has recently come to hand from Soviet Russia. The belief that prevailing methods of instruction are largely fruitless, and that an organized curriculum is more or less artificial, led to the abandonment of formal instruction in the class-room. The pupil was thus freed from making any other effort than that required for immediate and strictly utilitarian purposes. Such a method involves a minimum of tuition and directed work. The results of this experiment have not been promising. Able men of Science and Letters with well organized minds and knowledge available for use have not been forthcoming with the result that more systematized methods of instruction have been reinstated by the National government.

Advances in social development are slow and painful. In this field the possibilities of education are relatively untried as yet. To be sure, the potency of a guiding ideal has been previously demonstrated in the case of many European countries. National aims and ambitions have been the controlling influence and with rather disastrous results as subsequent events have revealed. In the absence of a specific aim development is bound to be sporadic. The school systems of recent times have at least succeeded in introducing a modicum of organization into the field of individual development and with the aim of imparting knowledge have unwittingly accomplished a more important



task. Where the opportunity is greater and the organization demanded is more artificial, a conscious directed aim would seem to be demanded. The question at once arises as to what this aim should be. Opportunity for the furtherance of individual development, the fulfillment of national aims and ambitions, and the formation of a communistic society wherein the individual would be submerged, are competing ideals. This is speculative and dangerous ground and the results of experiments may entail more disastrous consequences than have been forthcoming in the narrow field which has already been explored. In the succeeding pages we shall attempt to show that consciously directed thought is the greatest factor making for individual development. Civic consciousness and conscious solidarity are the aims to be cultivated in the realm of Social Relationships. As Professor J.H.Muirhead has said;

"The motive must always be not primarily to produce a special form of social will, but to enlarge understanding and sympathy, and to promote a freer, more candid, and more continuous commerce between the individual and his world. The strengthening and purifying of social purpose is an assured result. But it is assured best when it comes as the response of the individual mind to the appeal of a wider and deeper knowledge of the high adventure of man's social life." (I)

Sec. "2"

The truth inherent in any concept must eventually be established by experimental methods and it is by this standard that the procedure adopted in the past must be

(I)" Social Purpose." Hetherington and Muirhead. p.224.

judged. Whether the reminder be palatable or not it is none the less true that the disaster of 1914 was directly attributable to causes which were within the control of Society. Had there been a wider conception of the order and potential significance of the numberless relationships involved, had a greater amount of foresight been exercised and a wider sympathy prevailed who could doubt that an advancing civilization would have been spared its Armageddon? We, today live in an unhappy world. Perhaps at no other period in history has the ordinary citizen had a keener sense of the futility of his existence. As Graham Wallas has pointed out, the artificial mode of prevailing civilized life may partly account for this condition, yet society should not acquiesce when remedial measures are ready at hand. The educational endeavors of the past have not been without effect, but the results have in great part been other than those which were desired. It is apparent that the organization of the powers of the individual has been one of the most important accomplishments- although done incidentally through the endeavor to build up and transfer systematic knowledge. Nevertheless the direction for further profitable advance is here indicated and the course of future endeavor is likely to run along this line.

Our basic assumptions are today, as never before, in need of constructive criticism. The older conception of man as the crowning achievement of evolutionary development needs a new interpretation. Can Mind be considered

merely in the light of its development as a biological utility or is it to be disconnected from the circumstances of its origin and regarded as a real force making for progress? In what manner is man related to his fellows- is it merely a question of genetic relation or is Society to be deemed an extension of the orderly processes of organization as exemplified in individual attainment? Must society be considered as static, or is it the vehicle for the display of dynamically distributed forces as well as a preserver of the accomplishments already attained? The limitations of the mechanical view are expressed very tersely by L.T.Hobhouse when he says;

"There nowhere appears any reason to impute the existence of any forces but those that we call mechanical or chemical. It is true that the details of the mechanism or of the chemical change are not yet fully made out. But so far as investigation has gone it has yielded no reason for excepting reflex-phenomena from ordinary mechanical laws. The reaction is no doubt complex, but it is pretty nearly as regular and undeviating as the response of any confessed machine to the pressure of a knob or the turning of a handle. The child squeezes its doll and by virtue of a cunningly concealed mechanism it cries. Something squeezes the child and in virtue of a still more cunning mechanism it cries more effectually. (1)

This view, as Hobhouse means to imply, is at least open to criticism. There is need for a review of many of the assumptions which have found a more or less secure place as the basis for present-day curricula and a careful evaluation of them in the light of recent thought would probably modify the application which is given to them in actual practice.

(1) "Development and Purpose" L.T.Hobhouse. p.5.

Sec. "5"

The present day philosophy of materialism is in part the result of a long period of growth. From Hartley, Locke and Hume- to Watson the theory has been maintained which insists that a satisfactory explanation of the life processes can be given in terms of their physical correlates. This age old belief has been dressed up in new guises and at the present time Behaviorism occupies the stage. Current American educational methods are largely based on the principles of this school and Canadian practice has in great measure accepted the same assumptions. It must be admitted that in actual application in the class-room much common sense has been exercised and there has been a lack of the rigid enforcement which an ardent advocacy would demand. Professor R.M. Ogden, one of the leading advocates of changed methods in Education, expressed the feelings of many when he remarked that he had found himself out of sympathy with the "mechanism" which has supplied the laws and principles of many current pedagogical doctrines. The causes of dissatisfaction are manifold and the most common criticism has reference to the deficiencies of the theory rather than of the elements of error. In his experiments the behaviorist lays a minimum of emphasis on the general setting and the condition of his subject, and places great stress on isolated results while failing to draw the constructive conclusions that are expected. No satisfying hypothesis is given of the gap between the "Stimulus" and the "Response" which would be of

such a nature as to aid an educator in practice. Rather, the outworn theory of the materialists of an earlier day is made to supplement the lack of a positive explanation. The method of experimental analysis which is employed will probably set a standard of objectivity for all time and it is rather the lack of a synthetic treatment which must be criticized. The advocate of Behaviorism busily engaged in proving that there are no centrally aroused responses misses the point that every response is centrally determined. Not only are the present resources of the subject minimized but the position is carried still further by the dismissal of the facts of heredity. Dr. A.N.Whitehead in speaking of the place of University Education says that:

"At school the boy painfully rises from the particular toward glimpses at general ideas; at the University he should start from general ideas and study their application to concrete cases." (1)

It is true that details are forgotten in later life and this explanation is given because the process is seen in retrospect. Would it not be truer to fact to recognize that those "patterns" which were of import in the original learning persist as wholes throughout later life? Wolfgang Kohler in summarizing the prevailing trend of present day "functional" psychology says:

"A process starts somewhere independently and its way is determined by a well conducting path pre-existing by inheritance or formation in earlier life. The process, then, arrives somewhere, as a stone which I throw hits the window, and produces those effects which it must produce under the conditions given at this place of arrival!" (2)

(1) "Aims of Education" A.N.Whitehead. p. 41.

(2) "Psychologies of 1925" p. 185.

In addition to citing these instances of the questionable position to which a strict interpretation of the Behavioristic creed leads and to which current pedagogical methods owe a certain allegiance, the time would seem opportune for pointing out a rather disquieting development. Western civilization has made the pursuit of economic considerations its primary aim and it will scarcely be denied that matters of humanitarian interest and more enduring worth have been forced to assume a subordinate position. The battle cries of the economic evangelist calling for a larger mass production of a uniform product, and for greater efficiency, have penetrated the class-room. The result has been a strenuous effort to discover the sources of waste and an unworthy haste to apply an apparent remedy at the point of difficulty. There has, as a consequence, been an intensification of the difficulties to which such a short sighted policy has led. Today when the western world is submerged under the system created by the oft-heralded economic experts, it is from the schools that guidance is sought, and it is not forthcoming.

From the vast amount of effort which has been spent in promoting educational advancement substantial positive results might reasonably be expected. While progress has doubtless been made, it is not of the character or magnitude that was anticipated. This is not surprising when we consider the foundations on which the structure of educational method is built. The advocate of the principles of

behaviorism at the outset of his investigations determines to disregard the facts of experience and in his desire for "epistemological purity" places himself under an insurmountable handicap. The failure to appreciate the unique nature of the material with which he deals confirms the lack of a wider vision. Because of the failure to grasp the significance of the total setting of human life the theory is found wanting, and the lack of social import is its most unsatisfying feature. No cognizance is taken of the function of rhythmic development and the facts of growth and change are left uninterpreted. The results are obvious. Learning has become departmentalized and no attempt is made to interrelate the subjects of the curriculum. Even less effort is put forth to link the material that is studied to the life interests or purposes of the individual.

Criticism alone will not suffice-and while the first step in progress is the recognition of existing inconsistencies, there is need of an explanatory hypothesis. A functional concept is needed and one, which while free from "neurological tautologies," will draw support both from biology and physics. It must draw on the facts of experience to supplement and interpret the objective results of experiment. It must include an explanation of individual life and race history and give a reasonable account of the accomplishment of learning and adaptive response.

Sec. "4"

The formation of English educational methods has been

influenced by the force of a social ideal. The schools have been the brightest of a galaxy of factors that have contributed to the present temper of English Society, which is marked for its wholesome sanity; respect for law and order have become an outstanding national characteristic.

"England halts between two opinions. It has not decided whether to produce amateurs or experts" (1)

says Whitehead. Possibly this is to the advantage of progress. While teaching methods have exhibited a tendency toward variation and away from a dogmatic formula, a complicated set of external rules and precedents have been built up as the natural consequence of a long period of growth. The absence of that haste which has characterized the growth of American Institutions, has allowed time for a slower and more orderly development. Modifications have been taking place continually, yet they have been influenced by the lessons of practice, rather than by a comprehensive or unitary aim. The greatest praise that can be given is, that in the absence of any sure foundation or grounds for claiming the validity of a "Science" of education, judgment has been suspended and the schools have not succumbed to "testing".

A view, sometimes regarded as being old-fashioned, has always been current in English circles- in fact European schools are more or less agreed, in placing dependence upon the resources of the individual, and as a consequence, greater results are demanded. The high

(1) "Aims of Education" A.N.Whitehead. p.20.



accomplishment that is required of the University Graduate is an indication of this attitude. Not only has the dynamic and resourceful nature of the individual been presupposed but there has also been an adherence to the belief that "thinking" is a "true natural disposition" and that under guidance it becomes the prime element in all advancement. As a result of the emphasis on the resourceful nature of the pupil, there has been a corresponding recognition that his "attitude" is an important factor in securing results. The cultivation of motives and character development have not played a secondary role to the acquirement of specialized skill, but have been used as the basis for such acquisitions. Conscious effort is demanded, and the student must appreciate that the devices which he employs in learning by rote or mere memorizing will not substitute for the strenuous, self-compelled attention which he gives when learning of a higher sort is involved. When a lesson is presented outlining some hitherto uncomprehended fact or principle he must reach forth and endeavor to grasp the relations which the new material bears to what he already knows. The cooperation of the pupil is required and this is an occasion where he should be consulted. When there is a recognition on the part of the pupil that he must play an active role, a step will have been taken in the direction away from the present conditions. It may be that the "process" of hard thinking will no longer be shunned and that prejudice and ready formed opinion will be dethroned.

There is a vast difference between such a theory and our prevailing new-world faith in a nicely developed method of teaching and testing, as the solution of the problem of education on this side of the Atlantic. The prevailing faith is exemplified in the doctrine of "visual" education, as a specific theory. While the basis on which it rests is secure enough the grounds for its general acceptance are rather narrow and unwarranted, and too far-reaching conclusions are drawn. The lowliest forms of life exhibit an awareness of their surroundings and this primitive function is preserved in man. The organism displays remarkable powers of "unconscious" organization and adaption. In vision and audition- in fact at every contact with the environment the cruder adaptive acts are performed without the directed volition which characterizes the finer and more advanced responses. The point at which instruction becomes profitable must be high enough to coincide with the beginnings of "self-instruction" in the individual. Historically, Rousseau and Froebel have lent support to the theory that the role of the instructor is a passive one, and while agreeing to the idea that development is essentially self-development, there has as a consequence been a tendency to minimize the active part which instruction may play. Carried to the extreme, an exemplary system of tuition would consist of the arrangement of a suitable succession of stimuli. A child when given access to the world's store of knowledge would ultimately succeed in working out his own salvation. The

only task is to ascertain the perfect order in which the stimuli should be arranged. Although this is merely a caricature of existing methods it will be admitted that far too little call is made on the innate resources of the pupil and too low an estimate is placed on his capabilities. A larger vision of the relations involved would probably lead to a different interpretation of the part which tuition should play; an endeavor would be made to guide the train of thought and activity when set in action by the motive forces which are at present deemed self-sufficient; and the greatest service of instruction would consist of "giving a lead" and suggesting new avenues of advance.

Sec. "5"

The claim that America has produced a so-called "Science" of education has been widely made. On investigation it is found to rest on rather slight grounds. The assumption that testing of mental ability is possible, at least leaves itself open to question. Further, if it be admitted that an accurate basis for the measurement of inherent capability has been found, does it necessarily follow that it is this native ability which is the all-important factor? Would it not seem more important that the possibilities of progress should be present? Mental ability must be accurately defined before the exactitude of its measurement can be truly established. With a scant knowledge of that which is to be measured, tests have been formulated and within limits the results seem to reflect the nature of the tests rather than

the interposed factor of mental ability.

Many Educationalists of America have welcomed the advent of "Scientific" measurement. It may be here pointed out that the methods of the Physical Sciences have shown a progressive course of development from qualitative observations to quantitative measurement by standards. It would seem requisite that the wholesale adoption of such a mode of procedure should be preceded by a survey of the total situation. It may be very desirable to obtain a "measuring rod" for intelligence but it would seem more appropriate that the inner nature of the psycho-physical organism should first be established on a satisfactory basis before too great an amount of credence be placed on the efficiency of the measurement of end results. The present trend of endeavor lays its greatest emphasis on the factual performance of the subject and it is assumed that performance is an indication of maximum ability. This is a view seriously open to criticism. However this may be, it is necessary to point out that an undue consideration is given to both the "Stimulus" and the "Response" and far too small an effort is made to first investigate the cause of the self-determined acts of the individual. The author of a new test, in praise of the efficiency of his creation usually cites the time-worn example of the contrast which his results exhibit in comparison with the estimate of the teacher. Attention is not drawn to the total situation and little evidence is available to show that the human estimate of the pupil does not

prove to be the more correct one when the actual attainments of his later years are considered. If there is any truth in the oft-affirmed significance of a total setting, if a whole situation lends aid to the interpretation of a single performance, then the teacher still has a function to perform and his activities are not limited to the administration of a set-formal test. However efficient a test method may be in determining the stage of advance that has been reached it fails if it does not succeed in correlating the stage of progress with the pupil's previous attainments. Arguing in similar fashion Madison Bentley says:

"Those who use the testing methods sometimes contend that to measure accomplishment is at the same time to measure 'ability'; that under specified and controlled conditions 'the measure of ability and the measure of performance have synonymous meanings'; that 'for every performance there is a corresponding degree of ability'. But such an equation can only mean that 'ability is ability to do'; that an individual performs as he is able. There is no harm in this tautology unless 'ability' is illicitly made to stand for something more than readiness to perform" (1)

Again he says;

"But whether measurement in psychology is really mental measurement, as some structuralists have argued, I have had occasion to doubt; for I have thought that what we actually measure by the psycho-physical methods is functional output and not anything which can be turned into 'process' (2)

Many will admit that the "Formal Test" has a certain amount of value. If a test can be found which is adapted to the exact situation which is presented, convenience sanctions its use; otherwise all the objections, which

(1) "Field of Psychology" Bentley, p. 430-431.

(2) "Psychologies of 1925" .p.401.

adhere to the use of a set external examination, apply in this connection. It is not the test itself which is the subject of criticism, but rather the far-reaching significance attributed to it and the unwarranted assumptions that are made with so little justification in fact. Kohler strikes a note of caution and makes clear the above point of view when he says;

"Apparently something like a crude total ability for certain achievements is measured by those tests which have been invented and applied since Binet and Simon. And since the test-scores show a rather satisfactory correlation with certain general abilities in study or other work of subsequent life, we have in these tests a first approach towards a practical prognosis. Still there is a grave danger in this very success. Do we know or do we learn by those tests what processes and factors, which are masked by the gross scores, cooperate in the test performance? We do not know, nor do we learn much, concerning these factors. Figuratively speaking, a given total score may mean 3 of 'intelligence' together with degree 1 of 'accuracy,' with degree 4 of 'ambition' and degree 3 of 'quickness of fatigue,' or it may mean 'intelligence' 6, 'accuracy' 2, 'ambition' 1, and 'quickness of fatigue' 4,- and so forth. Quite a number of different factors may combine in various proportions in order to give the same I.Q. And that fact matters, even for practical purposes. In the educational situation a teacher should treat the child according to the actual nature and strength of the various factors constituting the total I.Q. of a given child" (1)

The total resources of the organism must be taken into account before a comprehensive interpretation of the individual life processes and race attainments can be given. Educationalists should be wary in their too-free acceptance of any panacea offered under the name of "Science." Behaviorism has used a one sided method and "experiment, observation and measuring are not the only methods employed by science

(1) "Gestalt Psychology" p. 47. Kohler.

but hypotheses are used." In view of the instability of the tenets of orthodox Behaviorism today such a hypothesis is badly needed and the pedagogue who fondly hopes that the day has arrived when every problem he encounters will not present a unique situation must realize that the course of development will never be halted and that the path of human advance rests on the basis of constant change.

Sec. "6"

Even a brief consideration of the topics that have been outlined here should serve to produce some misgivings as to whether or not all is well. If it be admitted that the last word in progressive methods has not been spoken, a search for new grounds should be initiated. Any change in the theory which lies back of educational methods necessitates a corresponding change in practice. The lessons of contemporary schools of psychology must not be missed and no one system of thought should be adopted to the exclusion of the elements of truth in other folds. It would probably be wiser in a preliminary valuation to scrutinize the wider relations which are involved. In the past the authority of generally accepted philosophical principles has not been invoked. Had it been so, the unsatisfactory predicament of today might have been avoided.

Conditions being as they are it is unlikely that partial measures would succeed and probably a total realignment of theory and method will be required. It is worthy of note that there should have been such a wide-spread adoption of the principles of mechanism and it is equally

remarkable that the educationalist has so seldom questioned the wisdom of this course. Very recently there have been serious misgivings, and the conviction that analysis alone leads nowhere without the company of constructive conclusions is gaining force. Aside from theoretical interest- changing conditions have in their evolution made clear the necessity for new and broader foundations.

Part. "2" Sec. "I"

In a world of inanimate matter it would seem a truism to say that Life is unique. It would be absurd to say that all movement is accompanied by vital organization and subjective experience. Matter as such is subject to the cycle of cause and effect but only living beings have experience. Behavior, as the complement to this feature is the objective manifestation of the influence of stimuli upon living forms. The origin of life is shrouded in mystery and all living things show resources which shadow forth the potentialities of "life forces." Organic life forms are infinitely complex in structure. Kohler has said;

"If organisms were more similar to the systems investigated in physics, a great many methods of the physicist might be introduced in our science exactly as the physicist uses them. But the similarity is not very considerable, practically. One of the greatest advantages which makes the physicist's work so much easier, is the simplicity of his systems. And his systems are simple because in physics the experimenter determines their main properties himself. He prepares them, more or less. I am far from believing that organic processes are of a supernatural kind. On the contrary, the most startling difference between the organism and a simple system investigated by the physicist is the enormous number of physical and chemical processes which, depending upon each other in the most intricate manner, occur in the organism



simultaneously. And we are utterly unable to create simple organic systems for elementary study. An amoeba is a more complicated system than all known systems of the inorganic world!" (1)

In addition to the complexity of structure which even the simplest organisms exhibit, another factor that points to the unique character of life is seen in the numberless adaptations which living forms have made and the wealth of variation that is displayed throughout the animal world as the result of evolutionary progression. Inorganic matter does not behave and the student engaged in psychological research would never confuse a fact of behavior with its apparent immediate cause. To again quote Dr. Kohler:

"We would also know that, in studying the properties of a nerve-muscle- preparation, we are not investigating 'a part' of natural behavior; because, physiologically its properties are not only simpler but also radically different in some respects from what they would be if the same nerve and muscle were contributing to normal behavior. It is the whole organism, as some behaviorists have rightly said, the behavior of which is our subject-matter. (2)

The essence of living forms is their self-identity. Unlike inorganic matter each individual has properties and differences which mark him off from his fellows and these variations are not essentially those of physical structure but "total" differences that depend on the autonomy of the individual. Unlike gross matter, life wherever it exists gives evidence of its unique nature by the display of self-direction and advance. There is an organization of the

- (1) "Gestalt Psychology" Kohler. p.44.  
(2) "Gestalt Psychology" Kohler. p.45.

"field" internally and always with adaption as the end to be served.

Not only is life a unique factor in an inorganic world but it is creative. Through interaction with its environment adaptive acts are performed and such useful action presupposes change within the agent. Every moment of life as it brings different surroundings demands a change in the subject if an adequate response is to be forthcoming. Professor R.N.Ogden states this fact very clearly when he says:

"The form of action or behavior is constantly changing into something new, different, never before attained. This is a principle of evolution which may be truly described as a transformation. (1)

And again,

"What was previously a mere dependent member or aspect of some larger whole, now, under appropriate conditions, emerges as an individual within the set conditions of the whole; a member suddenly articulates itself into a new and original pattern, distinct from the matrix from which it has emerged. Accordingly, we have the paradox of a genetic continuity constantly throwing off individual patterns of matter, of behavior, and of experience."(2)

Historically, the growth of structure and consequent ability to make an appropriate response would seem to have followed the path of necessity and conversely the newly acquired resources have led on to attempts to surmount the obstacles of environment; thus both need and the potential power of advancement have acted as alternating and competing agents making for progress.

(1) "Psychology and Education". Ogden. p.120.

(2) "Psychology and Education". Ogden. p.121.

"To speak of individuality as the ideal of life implies, then, that life as a whole is autonomous and that it constantly strives after unity" (1)

says Percy Nunn. The adaptive nature of all response to the surroundings implies a beginning and a subsequent continuity of action. To again quote Nunn;

"Biological studies give one a lively sense of a solidarity in nature running through the whole gamut of animal existence. They teach us that all animals, from the amoeba upwards, are centres of energy, in constant dynamical relations with the world, yet confronting it in a characteristic attitude of independence" (2)

The organism, through intercourse with the environment is constantly meeting new situations with a unique adaptive preparation and from the contact arises another set of relations and a changed agent- but always, the genetic relation is maintained and the new situation is grounded in its antecedents. Low down in the scale of animal life the physical structure is relatively simple. As central development proceeds, each succeeding life form displays an increasing differentiation of function, yet the "whole" responses assume a greater simplicity due to their newly acquired efficiency. The movements of Infusoria while more or less uniform, serve a variety of functions. Let this be contrasted with the act of a bird in uttering a mating call. Here, the structural organs involved are highly specialized and the function served is a unity and nicely adapted to the larger life situation. Had there been an inability to muster all the resources of the organism to

(1) "Education, its Data and First Principles". Nunn.p.II.  
(2) "Education, its Data and First Principles". Nunn.p.I7.

cope with each contact of the environment, life would have been unable to progress from its initiation whereas its very nature implies a capability of action. Every moment of existence and more particularly each point of outstanding overt action, requires that the total of inherent powers should focus to meet the situation. The interaction is of a dynamic nature and the organism, that it may the better perform its function brings an additional contribution in the form of an ability to anticipate the situation-

"So we are led to a more complete application of the theory of direct dynamical determination" says Kohler. "There is no mere sequence of indifferent events, connected indirectly. Each phase of what happens grows out of its predecessors, depending upon their concrete nature. And the subject, whose experiences are an expression of this one developing context in the brain-field, will experience the development, along with its 'referring to', 'depending upon', 'away from', and so forth- that is, with insight" (I)

Human life is very different from the existence of the lower animals. Mind was evolved to master things and it is in the realm of brain development and the growth of mind- its psychic correlate, that the strongest proof of difference lies. The behavioristic experimenter in formulating results too often disregards the truth of this statement and the results of "animal" studies are very uncritically applied to human learning. The organization of the "Internal Field" is vastly accelerated and the human agent depends for his advance on this superiority in this respect, and less on the resources which had been previously acquired. Even as an animal, man had proven his

(I) "Gestalt Psychology" Kohler. p. 390-391.

superiority; he had reached a stage of growth wherein adaptation was facile and more adequate than that of his evolutionary forbears. His restless nature had made him an excellent subject for the operation of the processes of "Trial and Error". Due to his precocious mental development the opportunities for the operation of "insight" and "forsight" were widened and these factors came as accretions to supplement the advantage of a developed intelligence. Only man exercises true will and viewing himself objectively can obtain a true perspective of his relationship with the world of "otherness". It has been said that every individual life-history is a recapitulation of racial development; however this may be it would seem significant that the functions which were first acquired in the course of the race history are least subject to conscious control. The visceral organs operate on a level below that of voluntary control. It may be inferred that "consciousness" has been relatively late in breaking through, and that the purposes it serves are of a higher plane than those demanded by the crude adaptive responses solely concerned with survival utility. "The will stimulates a mental activity" contrary to nature with the indirect result, that man far surpasses all other life forms in the completeness of his organized "patterns". The processes of "Trial and Error" are hastened-being staged on the plane of imagery with the aid of an efficient intelligence factor. The mastery of language in infancy bespeaks an unhitherto attained stage of organization and definitely marks man as being different from the

brute. This degree of present clearness depends in large measure on "true" memory which is characteristic of man. The experiments of Dr. Watson prove that animal memory is "motor-memory" and allied to "kinaesthetic" activity whereas in man the activities of recall are largely subject to conscious control and aided by a more adequate and lively imagery serve as the foundation for easy adaption. The interposition of conscious control between the stimulus and the otherwise "automatic" response is effectually paralleled on the side of motives to action. By reason of the "overgrowth" of intelligence, man, as we have said, is able to conceive himself as an objective unit in a dynamic situation. The direct consequence is evident in the human appreciation of the altered relation which exists when the "ego" becomes one with the "alter." "Aidos" as Graham Wallas terms it, is a very real factor in determining human action. In the animal kingdom there is no counterpart of human moral action. Professor Muirhead has remarked;

"At a certain time there is what Mr. Wallas calls a 'quantitative which amounts to a qualitative distinction'. However much the intelligence of the higher animals approximates to that of man in the use of memory and association, man has the advantage, co-ordinated with the use of language, first of being able to analyze a situation, distinguishing means from end, and organizing action for the attainment of a purpose, and secondly of distinguishing between the relative value of purposes and the resulting organizations. The consequence is that as the lower animals depend on the automatic action of association for the control of their lives by experience, so they depend on the mechanical action of natural selection for progress. In contrast to this, man has the power of interpreting the results of experience and embodying them in a rule or tradition. In Kant's language, while the animals are guided by law, man is guided

by the idea of law. It is true the law may work automatically, if we choose to say so instinctively, as in habit and custom. But the idea is there, and may be made an object of reflective thought. To us it seems a short step from the one to the other, and if again we like to say so, it is a step which is instinctively made. But in human history it has taken a long time to make it, and it is only being made at the present moment under exceptional stimulus by any large part of the human race. When it is made the result is twofold. On the one hand it appears as a loss. The instinctive balance of impulses, the natural aplomb of unreflective life, which Aristotle called 'natural virtue', is lost or remains only like a memory of innocence. On the other hand, it is a gain. It means that the way is open for progress towards an ideal of perfection which stands to the life of instinct as a picture to the kaleidoscopic grouping that might contain its general form and tones. If the unconscious is alone complete, the self-conscious can alone seek completeness" (I)

The concepts of the physical sciences are inapplicable in a description of living things. A theory that is sufficiently well-founded to be accredited and to deserve to be retained must accept the proposition that a new set of data is required for the adequate description of the phenomena of life. It has hitherto been assumed in certain circles that a "mechanical" explanation can be given for every act. It is because this mechanistic interpretation has failed that its validity is called in question. The categories of physics cannot give a satisfying account of an organic world where every act is unpredictable and unique. Further, as William McDougall has pointed out:

"In the present state of physical science, it is absurd to pretend that its categories must prescribe the type of all legitimate description and explanation. For these are in perpetual flux. In the palmy days of materialism, it was common form to assert

(I) "Social Purpose" Hetherington and Mairhead. p. 54-55.

dogmatically that the universe consists of atoms of matter, that all energy was the momentum of such atoms, and all change the transmission of momentum by impact of one hard and resilient particle upon another. But those days of the 'billiard-ball-universe' are gone forever, save perhaps in the imagination of a few belated biologists who have picked up their views of physical science from old-fashioned text-books. All the categories of physical science, matter, energy, motion, momentum, mass, and Space and Time themselves, are in question; and no man can say whether any one of them will emerge alive from the fermenting chaos of modern physical speculation. For, if the matter of the brain can generate 'sensations' which can combine to constitute the various forms of experience, then the account of it which physical science gives is most misleading, and the categories of that science, however useful they may have been, are only distant approximations to the truth! (1)

And again to quote McDougall:

"To all appearance the life-processes of living things are fundamentally different from inorganic; and we have no guarantee, no adequate ground for believing, that this appearance is illusory. And, if we uncritically adopt this mechanistic faith, and under its influence elaborate a picture of the world in mechanistic terms, we inevitably arrive at an absurd position, as the history of thought abundantly shows; we find we have created a picture of the world which leaves out of the picture entirely that mental process, that purposive striving, that creative activity, which has produced the picture, our conscious striving to construct the picture, our conscious appreciation and understanding of it when constructed, remain outside it as something whose relation to the picture is entirely unintelligible. And so we have to start all over again, and strive to 'remould it nearer to the heart's desire', the desire to understand man's place in the universe!" (2)

In the following pages an attempt will be made to suggest the manner in which a new set of data, already at hand, may be used to interpret the relation of the organic to the inorganic world.

(1) "Outline of Psychology" McDougall. p. 33.

(2) "Psychologies of 1925" p.303.



Sec. "2"

Life is the manifestation of "hormic" forces operating through the medium of matter. Their nature and strength, in the absence of the opportunity for immediate observation, must be inferred from their results. It may seem a false method of attack to ascribe the existence of living things to certain forces and then in turn to interpret the nature of the forces by a study of the life which they sustain. It must be kept clearly in mind that life is essentially different from inorganic matter and since it displays behavior it becomes necessary to postulate the existence of innate resources. A preview of the field involved in such a hypothesis must first take cognizance of the similarity of the behavior of organic forms wherever observed. While it is true that the needs and immediate accomplishments of each individual exhibit a wide variation, yet there is an ever-present tendency to act. In the early stages of evolutionary progress cognition and conation probably went hand in hand. It may be presumed that, since a knowing depends on an experiencing and as no experiencing is possible without activity, that conative action preceded the advent of that awareness, which the advanced forms of life display. Further, a changing environment and new demands did not over-tax existing potential capabilities, and wherever the development in physical structure kept pace with new needs, motives for action were not lacking, and the unity and expanding continuity of the existing hormic powers were exemplified. As the process of development proceeded, new characteristics

were transmitted, and each succeeding period of growth marked a higher point from which advance could be made. The inherited "patterns" became more complete and while the nature of the conative urge remained unchanged, the vehicle of physical structure became more efficient. A theory now current ascribes all power to initiate action, to the body of "unlearned activity" or instincts. (1) While it must be admitted that instinctive promptings are overwhelming in many instances, there would seem to be a danger in the failure to differentiate the nature of the "forces" involved from the ready-formed patterns which they tend to follow. The very multiplicity of the instinctive responses would indicate a common source of origin. The weakness of the theory is disclosed in the failure of its advocates to satisfactorily explain the psychology of "play." McDougall says:

"The creature is most disposed to play when it is so well nourished and rested that it has a surplus of stored energy. But this is true also of work.(2)

and again:

"Play is activity for its own sake, or, more properly, it is purposeless activity, striving toward no goal. Whence, then, comes the energy that sustains it? The answer is, I think, that the well-fed and well rested animal, especially the young animal, has a surplus of nervous energy which works through the channels of the various motor mechanisms" (3)

This seems to beg the question. It is not enough to say that play is the outcome of "surplus nervous energy." Whence the key to release this energy and what is its nature? Under what

(1) "Purposive Psychology"

(2) "Social Psychology" McDougall. p.92.

(3) "Outline of Psychology" McDougall. p.171.

conditions is it freed? It seems inconsistent to ascribe such a common phenomenon to mere "surplus physical energy" and yet credit the inherited patterns of instinct with the power of initiating activity. A common source of power must be postulated and its discovery will serve as a starting point for an explanation of all life activity. "Play" as the typification of unshackled hormic power is a significant indication of the tendency of all organic forms to act in dynamical relations with the world of matter, and while this action is generally guided by previously organized patterns, yet it may on occasion assume the freedom which characterizes the acts of the lowlier forms of present-day organic life.

Historically, the distinction between the nature of the motivating power of life activity and the vehicle of distribution has not been clearly made. It is understandable that the observable expressions by which the nature of the activating source of energy reveals itself should be taken for that which they exemplify. Yet a failure, to grasp the real point of difference involved here, precludes the wider view which is necessary for a conception comprehensive enough to interpret the multiplicity of single phenomena which constitute life activities. It may be readily admitted that behavior is unique and characteristic of the organic world alone and also that the mode of distribution of the potential energy of living things is infinitely complex and wonderful, but there must also be a clear understanding of the difference between the end results with their instruments of attainment

and the original sources which initiate and sustain the life processes.

The extreme refinement and adequacy of the physical structure reflect the persistency and magnitude of the energizing forces which motivate life. The student of psychology in every experiment with living matter assumes the fact of behavior. More to the point- behavior is the characteristic by which organic existence is identified. Not only is all life characterized by overt action, but such action wherever found, exhibits common tendencies. To a greater or less extent the responses to the surrounding medium have an adaptive value. There is a building of the new on the basis of previous attainment, and continuity is preserved side by side with the elements of progress. The very existence of a continuous development implies a beginning, while the fact that progress is possible postulates an end- though it may be in large part undefined. Nor may development be considered as an accumulation of previous attainments only, since at each period of growth a transformation is effected, and the resulting process may be admitted as the experiments of dynamic psychology assume it to be, viz: the unfolding of a complete whole. Biology has taught that all development of animal forms is cyclic and save for freak variations repeats its own periods of rise and decline and each individual history is but a small part in a larger scheme of advancement. The hypothesis that the underlying cause of life is uniform and constant and finds only a partial fulfilment of its possibil-

ites through the medium of existing structures, will go far to explain the phenomena of evolutionary development. Such an assumption will account for the recurrence of similar forms and the coincident outward steps of advance that are accomplished at rare intervals.

A comprehensive survey of the larger aspects involved would result in a correction of the perspective. The behaviorist school has placed its emphasis on the significance of the wonderful body-mechanism, while its opponents have dwelt on the facts of experience. Speaking of the development of mammalian forms, Bentley says:

"We find life taking many courses; each course laying its own emphasis upon some particular function or group of functions. But these emphases pertain more to the extension of a given function toward its limit than to the evolution of any new basal functions" (I)

Here we observe the limitations of the theory which endeavors to explain the history of development in terms of non-purposive or sporadic adaption. The significance of the evolution of physical structures is twofold, and a corresponding growth of experience is involved. Its unity in the life-history of the individual persists from birth till death and is only paralleled on the side of structure by the totality of the processes of racial history. Subjectively, the unity of the experience of each individual would indicate a cause. Since a theory is unsatisfactory which proceeds to explain such a result by the analysis of consequents, the existence of a "hormic" factor must be postulated. A method of approach which aims primarily to explain the nature of physical

(I) "The Field of Psychology" Bentley. p. 530.

development in the light of experience, and that searches for "qualities of sensation" that they may throw light on the nature of structural adaption, seems to be an inverted order of procedure. Bentley unwittingly instances this point of view when he says:

"The loss in coordination and in central control as we pass toward the lower phyla of invertebrates suggests that we proceed cautiously among these simpler forms for evidence of qualities. First, the close structural and functional relation, in the higher organisms, between nervous and muscular elements, leads us to ask whether muscle and nerve had a common origin in a primitive cell or tissue, possessed at once of receptive and motor characteristics, or had, instead, independent origins and came only subsequently into functional union. It appears now that the contractile muscle-like structure is the older. Its independent existence has been observed in certain of the sponges (Stylotella) in which the intake and outlet pores for water are opened and closed by surrounding effector tissue which is directly acted upon by water currents, injury, and certain drugs" (1)

An acceptance of hormic activity as the basis for investigation would reconcile the interpretations which are offered in support of the doctrine of the evolution of structures and the psychology of experience respectively. Dr. Watson suggests that an advance would be made by substituting

"The Activity Stream" for James' "Stream of Consciousness." (2)

This seems quite reasonable and is a nearer approach to a satisfactory basis of explanation. Yet, both James' conception and its suggested substitute have a basis which is insufficient to support a satisfying interpretation of the facts of life, and a synthesis of the elements of truth in both

(1) "The Field of Psychology" Bentley. p.516.

(2) "Psychologies of 1925" p.33.

contentions is made if it be assumed that both action and experience are but varying manifestations of a common cause. Kohler has made an attempt in this direction and indeed, carried it to great lengths.(X)

The evolution of mind is the crowning achievement of hormic activity. Its subdivision into conscious and subconscious activity is not a problem that need be discussed here. Rather, the mental processes must be thought of being unitary in nature and should be treated as the evidence of previous organization. The theory that the resources of the developing organism outrun the demands of necessity has been already set forth. If mind be considered as the highest product of progressive development then it may be expected that the part which it plays in anticipating and furthering advancement will be its most significant feature. When speaking of the means by which social progress is furthered, E.J.Urwick says:

"In every stage of social life- very slightly in the earlier, very markedly in the later- aims and purposes are subject to a force which appears always to be drawing them on to some goal in front. Even the push of necessity and the impulse of natural feeling are, in the most primitive human societies, slightly modified by the pull of something resembling an ideal; and this pull seems to gather force as mind becomes more directive and the effects of the social interaction of minds become more marked. For in the mental stage progress takes place by means of inventions, using the word in the wide sense, which includes new ideas as well as new contrivances. We are often tempted to say that inventions are for the most part accidental; there seems to be no particular reason for the invention, at some particular time, of a spinning jenny or a steam engine or a new political or religious dogma. But a little reflection shows that it is truer to say that inventions are never accidental,

(X) The endeavor to show that some physical phenomena express true tendencies.

but always appear in response to felt needs and purposes. This is probably true, even of mechanical contrivances; much more certainly of idea-inventions. And when we trace the cause of inventions to felt needs and purposes, we are falling back once more, not upon given and discoverable pressures, but, in part at least, upon the causal influence of the ideal whose origin we have not yet discovered!" (1)

It need not be pointed out that the existence of ideals depends on mental activity as against the cruder forms of adaption which served a more primitive function. Not only is mind the prerequisite of the formation of any end or purpose but all future progress depends on the visualization of ideals. To again quote Urwick:

"For the process is unintelligible, both as regards the origin of the idea, and its development as a force of change, unless we assume the existence (in some minds, at any rate) of the conception of an ideal future which determines what ideas shall originate, and how far they shall be allowed to grow in influence. Apart from this 'force beyond,' the process in each stage is really purposeless. It is only significant for us as thinkers and as self-conscious beings in so far as the purpose derived from some kind of ideal end enters into it!" (2)

A whole philosophy is involved here and any present treatment must of necessity be brief. It will suffice to point out that one of two courses may be adopted. Life may be naively interpreted in the light of its evident manifestations and no endeavor be made to link the individual acts of behavior with the total context, or some explanation may be sought in the nature of its causes. If such a view is taken, it is imperative that the place of mind as an instrument employed to advance beyond the present stage of attainment, be not disregarded. An undue attention to the achievements already

(1)"A Philosophy of Social Progress" E.J.Urwick. p. 174.

(2)"A Philosophy of Social Progress" E.J.Urwick. p. 175.



acquired inevitably leads nowhere, and emeshed in the toils of the "mechanics" of the process, there is a failure to appreciate the total setting and the organism's unique ability to project itself into the future and by anticipation to objectify the values which it realizes at a later time.

Preview of Sec. "3"

In the following pages an argument will be set forth which maintains that the forces of life are subject to a dynamic distribution. The acceptance of such a radical principle would necessitate the abandonment of the principles of orthodox behaviorism; therefore, the claims of that school will be the subject of criticism. While the view defended will be in general agreement with the contentions of "Gestalt Theorie," yet an attempt will be made to show that it serves but as a foundation. The implications of Gestalt psychology will be developed and more than incidental importance will be attached to purposive action and its connection with the evolution of mind.

Sec. "3" Sub.Sec. "I"

Historically, the doctrine of behaviorism is on strong ground. The attempt to compass the facts of the universe by a mechanistic formula has persisted from early Greek days to the present time. Aristotelian astronomy, long sufficed to explain the nature of the universe and the conception of a Descartes has held enough appeal to be still retained by many as a basis for explaining the behavior of living things. The wide use that is made of measurement and the accurate employment of suitable

instruments is quite in accordance with advanced scientific procedure. The difficulty does not lie in a lack of precedents or in the methods applied in investigation but rather in the conclusions which are drawn from the available data. The doctrine of "apperceptive synthesis" which was current at a not distant date contained an element of truth and represented a position in advance of that now held by the behavioristic school. Each new perception was made to depend upon the existing body of "knowledge" for its interpretation. By its incorporation with previous knowledge, the experience of the moment indirectly came to exert an influence on the future. The fact, that the human organism is subject to constant change and growth, was not sufficiently emphasized and the result was the formation of a "Static" psychology considered in relation to the position herein set forth. This advance on the plane of structural development had prepared the way for the advent of the "dynamic" theory and its potential truth was evident enough to secure its early condemnation at the hands of the "mechanicians." Beyond a certain point the parallel ends, and the theory that a concept is formed, and that new contacts fit into their appropriate places would not suffice. A new set of data is discovered when the organism is conceived as being more mobile, and as being ever new at every point in time as a result of its ceaseless growth and change.

The behaviorist will admit no psychic explanation and from the very nature of his hypothesis this must be so.

He holds that all the phenomena of life can be easily explained by a combination of nicely adjusted units each consisting of a single stimulus and a direct response. No matter how complex the act may be it can be eventually made clear if only the search for more units of "Stimulus and Response" be efficiently prosecuted. Certainly, mentalist implications are forever barred, and in addition no credence can be given to so reasonable a theory as that set forth by "dynamic psychology." As a matter of fact, no theory, which would offer a comprehensive basis for the interpretation of life and its activities, may be considered. Movement or action takes the place of adaptive or purposive response. Any cause other than the nearest, last, and apparent agent of stimulation is left uninvestigated and no question of a far-reaching purposive end can be proposed or considered. Accomplishment becomes the principal aid to interpretation and the remarkable feature of the theory is the apparent failure to appreciate that this principle, that the facts of behavior can explain the nature of life, even though it contains so much of truth, cannot stand in its present isolated position. It is deserving of a kindlier and more acceptable setting than that which it holds. Madison

Bentley says:

"To depict a function or operation in its own terms is always better scientific method than to substitute for it its end. To say that printing is that process which turns out books and newspapers is not descriptive. It gives no intelligible idea as to how the printing press works. This is the easier way. Means and modes are often fugitive or complicated; whereas products are likely to be permanently at hand for deliberate scrutiny!" (1)

(1) "The Field of Psychology" Bentley. p.200.

Behavioristic investigation has taken the easier and more obvious course and life is described as that which results in Behavior. No theory other than that of a primitive sort has been formed and it does not attempt to describe the inner nature or cause of life in terms of mode but only in the light of accomplishment. Although excuse may reasonably be made for such an erroneous procedure, small grounds can be found for the retention of so narrow a position for any considerable time.

The pursuit of the study of physiology, and of its bearing on psychology, has not been fruitless. As a result of the investigations of the experimental psychologist, many disputable points have been established beyond question. Still, there has been an ever present tendency prematurely to close the circuit of possibilities, and as a consequence, a dogma of "eternally" true principles is laid down and an endless discussion ensues in its defence. As McDougall has said:

"Description requires classification of like with like; and the use of any word which denotes a class of like objects of thought implies the hypothesis that these objects are so far of common nature as to justify us in thinking of them as alike- for the particular purpose we have in view. Classificatory hypotheses of this kind are necessarily made by every science; and they have to justify themselves by their successful working. Without them, not only science but all intelligent discourse is impossible, whether about human nature or any other topic. The discussion of experience, of its conditions and its expressions, necessarily makes use of such classificatory hypotheses." (1)

Behaviorism is loathe to accept the validity of experience and thus discards an indispensable source of aid. Its

(1) "Outline of Psychology" McDougall. p.10.

greatest contribution has been the emphasis it has placed on the role of experiment and it will be for other schools to evaluate and utilize the results of the laborious and painstaking investigations that they have undertaken.

In his denial of "experience" the behaviorist misses an aid which is fundamental to every investigation. This is obviously due to the limitations of the doctrine which it has embraced. The reply of R.M.Ogden to the attack upon the validity of experience, is fairly adequate. He says:

"Two replies can be made to this attempt to treat psychology without its psyche. The first is that to place physical stimulation in opposition with a biological response is to misstate the facts of behavior. As we have found many occasions to note in our discussion of instinct, and as we have just now shown in the simple experiment of visual fixation, the physico-biological organism is not two things- a physical situation and a biological response- but one thing, in which the formal pattern of the situation participates in the organic response.

The second reply is that a situation-response as a single organic whole is revealed only in terms of felt enjoyment. The original datum of whatever is formed or patterned can be stated only in terms of experience. It would therefore be highly unscientific if we were to lift ourselves entirely outside of experience when we systematize empirical facts; because we must still employ the formulae which have been derived from experience" (1)

and again he refutes the statement that experience lacks validity because it is a matter of individual concern only:

"Facts are discovered by experience, and the formulae of logic and mathematics which are applied in their interpretation are likewise derived from experience; and hence to deny a scientific status to experience on the ground that it is always an individual phenomenon is to deny the validity of objective facts which must first be observed before they can be formulated into a scientific system" (2)

In other words experience is valid as it is a product of the

(1) "Psychology and Education". R.M.Ogden. p.II5.

(2) "Psychology and Education". R.M.Ogden. p.II6.

body-mind organism. In addition, it has the strongest of all proofs, viz: "it works" in practice, and for all ordinary purposes the judgments based on individual experience, serve in every-day life in a satisfactory manner.

Sub. Sec. "2"

Certain inadequacies and absurdities of the contention of the behaviorists are apparent. Their vocabulary abounds in such words as "reflex," "conditioned reflex," "stimulus and response." Many of these terms have not been clearly defined and have been allowed to stand for much which their authors would not be able to defend. The "stimulus" which is frequently mentioned, is subject to such qualifications. As one author has said, to speak of a mouse as a stimulus, is a play upon words and involves a shortcutting in expression which is not allowable. An object or event becomes a stimulus to the subject only as it has significance for him. In speaking of the implications which have grown around the word, "reflex," one critic says:

"No wonder that in these days the young student of psychology swears by 'conditioned reflexes' and is apt to regard the term as the key to most of the riddles of the universe, or at least as the master key of human fate! Having grasped this master principle, he feels, and in some quarters he is encouraged to feel, that he need no longer rack his brains over the traditional puzzles of psychology. For it has become clear to him that love, honor and duty, faith, hope and charity, reason, will and moral effort, are merely so many names by which we denote as many varieties of 'conditioned reflex,' of somewhat complicated pattern no doubt, but not essentially different from the scratch-reflex of the dog's hind-leg. He sees clearly that the good dog is the one whose 'conditioned reflexes' lead him to the softest spot and the best bone. Equally clearly he sees that the good man is he whose conditioned reflexes have been established by a

judicious system of rewards and punishments; and that the wise man is he whose conditioned reflexes lead him to avoid pain and to pursue pleasure. Sic itur ad astra!" (1)

The behaviorist in attacking his problems puts forth his efforts in a single direction, and his perspective is so limited as to lay him open to obvious criticism. The lack of a wider vision is exemplified by the extremes to which inexpert followers have carried the implications of the orthodox theory, and the position which is reached amounts to an apparent absurdity. Speaking of the methods of analysis employed, Koffka says:

"Although a natural-scientific observation is commonly supposed to be strictly analytic, the application of strict analysis to an animal's behavior at once reduces it to mere mechanics of limb, and physiology of muscle and gland- a reductio ad absurdum which even some of the younger behaviorists have begun to realize. Yet the difficulty of maintaining a scientific point of view disappears when we allow ourselves to assume that animals possess certain characteristics that can not be thus reduced to terms of analysis!" (2)

The defence of such an extreme position has been undertaken in the name of "science!" It should be admitted that all judgment ultimately rests on the basis of individual experience and although the behaviorist is not the only one who has questioned the security of this position, yet for all practical purposes science has adopted the findings of individual experience- subject to the verification of analogy and after consideration of all the relevant factors involved in the total situation. If the methods which behaviorism uses have an objectivity which is not common

(1) "Outline of Psychology" McDougall. p. 25-26.  
(2) "The Growth of the Mind" Koffka. p. 30.

to every day situations then it has failed to disclose and define it.

It may be true that the methods of introspective analysis are open to question. For the moment the relative importance of judging each individual act in relation to its total setting may be ignored. It may be difficult to substantiate the postulate that mind is a real agent and in a different category than its neural accompaniment. The doctrine of "mechanics" maintains the position that "consciousness" should not be considered a reality but only entertained as a myth. Let these various points be for the moment, admitted. When this has been done, does it at once follow that the explanation which the behaviorist offers is the only possible one? Having easily established some grounds for the rejection of "consciousness", it was forthwith assumed that the way was open for the acceptance of Behaviorism. It does not seem clear that this is entirely so. Even if the "psyche" of living things be repudiated the theory of point to point correlation between Stimulus and Response based on the outworn "mosaic" theory of psychology need not necessarily be, and indeed cannot be, the satisfactory solution. In the same connection Bentley says:

"There is still another defect which, while it is not peculiar to structuralism alone, deserves to be set down in this list with considerable deliberation. It appears in the assumption that the parts or members of experience run a course parallel to that of excitatory processes in the receptor. In the structural accounts of sensation each element has its own specific antecedent, and the 'theories' of sensation (visual, auditory, and the rest) attempt to set forth the antecedent term in this invariable sequence.



A corollary of this one-to-one relation between sensation and neural process appears in the emphasis laid by the structuralist upon 'stimulus! We see, then, how naturally sensationalism has tended toward a peripheral and sensory theory of bodily substrates. Again, in Angell's biological functionalism consciousness confesses its dependence upon physical antecedents within and without the organism. While the one-to-one correlation is less rigidly carried out here, the same principle of determination is evident. Only in the selective powers of attention and volition does consciousness wear the appearance of an originator and director. Nowhere, however, does this principle appear so fundamental to any psychological doctrine as in the stimulus-response hypothesis of behaviorism. There the consequent term is not sensation and not conscious function, but movement. As the organism is stimulated so does it move. Without this one-to-one parallelism behaviorism falls to the ground, or else it becomes (as we now frequently see it becoming) something different, though wearing the same label!" (I)

Behaviorism deals with "part" reactions. While it is freely admitted that the pursuit of psychology involves a study of the whole organism, at the same time the measurement of accomplishment is made in terms of partial reactions—rather, it should be said that the totality of factors concerned is neglected. Emphasis is laid on the result, to the neglect of the very necessary interpretation in the light of the antecedent causes. If it is of importance that an object becomes a stimulus only as it has a significance for the subject, it is equally important that the dynamic relation involved be carried farther, and it should be recognized that if any response is made it is a response of the whole organism to a potential situation. The discovery of the "all or none" law was indeed a high hurdle which the advocates of behaviorism have not successfully surmounted. The explanation of the acquirement of language is an

excellent example of the summary methods which are employed. Language is not considered as the supreme achievement of orderly organization, and as little significance is attached to this accomplishment as is given to the advanced cerebral development which characterizes the human race. Language consists of words and words are the results of physical reactions. Given the appropriate vocal organs and a proper environment, language will ensue. While it may be admitted that all which behaviorism has claimed in this connection may be true, yet the failure to appreciate the import of such an unusual achievement is an indication of the superficial treatment which is characteristic of its methods.

The essence of the dynamic theory may be briefly summed up by quoting Dr. Kohler's proposition;

"To a context, experienced as 'one thing' belonging together, there corresponds a dynamical unit or whole in the underlying physiological processes!" (1)

and again to cite the commentary of Madison Bentley when speaking of the "Gestalt Theorie"

"For them stimulus is not the real determiner of experience. As the latter is always a unitary whole or totality, so does it depend upon a similar kind of total-function in the body. Stimulus is the more or less incidental occasion of the experience, not the model or pattern of its integral characteristics!" (2)

To the proposition, that the patterns produced by organization in the sensory processes are the basis of ordered experience, behaviorism makes no emphatic denial, yet its acceptance is precluded since any guiding principle which would seek to give a comprehensive interpretation of the

(1) "Gestalt Psychology" Kohler. p.66.  
(2) "Psychologies of 1925". p.403.

phenomena of life must forthwith be rejected. The sanctions of behaviorism are negative at a time when positive concepts are needed. How greatly experimental investigation would be accelerated were it to be assumed that a single stimulus as such is unimportant except as it serves to initiate a train of purposive action! What a transformation in method would result, were the basis of investigation to be the organism as it really is, viz: a developed agent, possessing certain capabilities and resources and one which is equipped to interact in a dynamic relation with every new- arising situation! The long acquaintance with analytic methods of investigation of static factors, and the protracted period which has been spent on animal experiment, has blinded the exponent of behaviorism to the capabilities of the human agent. The results of animal experiment have led to the false assumption that the learning process is entirely a matter of "Trial and Error." Let it be admitted that it does play a part, would it not seem reasonable to admit, that intelligence when sufficiently developed plays a major role and adequately supplements the primitive process which sufficed at a lower level? If it be allowed that the stage of development is most adequately measured in terms of organization, then the place which developed intellectual power holds in relation to the process of "Trial and Error," is made clear.

Sub. Sec. "3"

True reflex action does exist. It is most perfect in those organisms high-up in the scale of development and is less perfectly illustrated in the lower forms of life.

The method of the earth-worm in securing its food could not, for example, be cited as an instance of reflexive action. The response in this instance is a total one and involves other factors than those which characterize the true reflex. The reflex may be identified by the machine-like rigidity of its performance, for with minor variations, due to material factors, its action is invariably the same. The heart-beats of mammalian forms, the visceral action of the amphibian and the tropism of the sunflower are widely scattered instances of the automatic action which results in an unvarying response. It is here that a disciple of "mechanism" would be at his ease.

Such action must be sharply differentiated from the "total-response." It is of great significance that those organisms, which exhibit the most perfect system of reflex-action arcs, are relatively high in the scale of neural development. Here would seem to be the proof of the mechanist's explanation of the way in which development has taken place. The responses of Salamander exhibit a paucity of reflex action and a correspondingly greater part is played by the total-responses. The higher vertebrate forms are presumably of a later period of development and this is quite incompatible with the assumption that evolutionary development has been a progressive course of advance from the first perfected reflex action to increasingly complicated aggregations of reflex arcs. The fact that the higher forms of life exhibit an appreciable number of reflex-action systems, lays itself open to misinterpretation. It may be inferred

that the presence of an increasing number of reflex arcs is indicative of the mode by which development has taken place. Such a view will not stand closer analysis. It must be recognized that the reflex act is but an instrument; that it serves those ends, which on account of their nature could be best carried out in a machine-like fashion. It has acted in a conservative capacity and, always subordinated to the larger good of the organism, has played little part in initiating the actions that had import for racial growth.

The conditioned-reflex is unsuitably named. It is not an instance of true reflex action since it does not display the constancy and automatic reaction which are its outstanding characteristics. Neither is "conditioning" a mere matter of association in time and place but rather it amounts to the incorporation of new factors. This involves an ever changing agent and a "total" dynamic situation. The following is an interesting description of simple reflex action and accurately outlines the ground on which behavioristic psychology has based its additional assumptions;

"Descartes' account of reflex action was merely a brilliant guess; but the subsequent course of physiological discovery has justified it abundantly. It has been shown that, in both men and animals, some elementary but seemingly purposive movements may be evoked, even when the brain is wholly out of action or destroyed and the individual remains unaware of the whole process. Thus, if the sole of the foot is pricked, most men and most animals will quickly draw away the foot. Common sense says: 'He feels the prick and draws away the foot in order to avoid the painful impression! Well, physiologists have shown that this withdrawal of the foot may occur in a very similar way, when the spinal cord has been separated from the brain. And a man in this condition, though he may see his foot move when pricked, does not feel the prick

or the movement; and he knows nothing of them if his eyes are closed. They have shown that the prick excites a nerve in the foot, that this excitement spreads up the nerve to the spinal cord as a wave of physical change (not unlike a current of electrical change in a telephone-wire) leaps across from the sensory nerve to a motor nerve (much as the electric spark leaps from one terminal to another) and so issues along the motor nerve and, reaching the muscles of the leg, causes in them an explosion which in turn causes them to contract and so withdraw the foot. That is the type of reflex action as conceived by Descartes and studied by modern physiologists. (I)

Sub. Sec. "4"

The conception suggested by Descartes' "brilliant guess" is an insufficient basis for the interpretation of organic activity. It has been previously admitted that reflex action does take place, but it is at best, a partial reaction and is evoked as an incidental factor in a total adjustment. There is here as little ground for the explanation of the accomplishment of memory as there was to account for the phenomenon of adaptive behavior.

A further search must be initiated and no better beginning can be suggested than to examine the manner in which the simplest adaptive act is carried out. In the first place the act is initiated by the drive or urge which T.P. Nunn defines as "Horme" ( $\delta\rho\mu\eta$ ) A certain object or constellation of stimuli serve as the signal for the initiation of the act, yet, as has been pointed out such objects or events would have no effect apart from the potentialities of the organism. The existence of "horme" has been questioned and it has been criticised on the ground of its vagueness. Such comment loses its point if it be kept

(I) "Outline of Psychology" McDougall. p.22.

in mind that *horme* is a characteristic only exemplified in organic life and that it is never discovered in isolated freedom of performance. The essence of organic existence is the presence of *mneme* ( $\mu\upsilon\eta\mu\eta$ ) side by side with the "will to live!" It would necessarily follow, that each occasion for action finds the organism in a state of preparedness. Chaos and the free association of factors, dictated by chance, do not rule. Each new act is the outgrowth of certain antecedents and the previous life and racial history of the individual is the guiding factor in determining the bias under which a new act is carried out. Disregarding the operation of hereditary transference, each moment of existence contributes its quota of effect upon the growing entity and from birth till death the field at no time presents the characteristics of a "tabula rasa!" "*Horme*" is the propelling force and "*mneme*" the conservative factor. Without the preserving influence of *mnemic* action each encounter with the environment would present an entirely new set of features that would over-tax the assimilative powers which are present.

"Progressive coherence and adaptiveness" feature the advances in neural development and the effect of experience exerts an influence in direct ratio to the wealth of physical endowment. This cannot be due to a mere chance relationship, and must rather go to prove the strength of "*mnemic factors*" in making the environment more intelligible. Experience is orderly, and unless it be disregarded altogether, the nature of its coherence must be explained by the neural equipment

that serves as the medium between the experienced "self" and the world. Since experience is orderly both in space and time, it must be so either on account of a real order in the environment or to the interposing agency of neural activity, or both. If the common sense view be taken that the world exists in the ordered fashion in which it appears, then the existing neural action must be deemed to be efficient. In the past, the effect of stimulation has been thought of as a process of "stamping in of impressions". The result has been the formation of a cast-iron psychology. The smithy of environment by successive blows succeeds in moulding a thing "he knows not what" and each stroke is guided by chance- both author and subject being passive participants in a game of blind-fold. Such a conception has long outlived its usefulness, and if the effect of previous conscious and unconscious memory be admitted it will not suffice to consider its effect as being the consequence of mere succession. Nor, on the other hand, will the association of contiguous factors give a satisfactory explanation.

An account of the place which "mneme" plays in progressive development, is only intelligible, when the manner in which perception takes place is made clear. On the other hand, the "dynamic" hypothesis here proposed is confirmed by the presence of mnemonic factors and the manner in which they function. Koffka says:

"Mere chaos can neither be meaningful or unitary. To cut a long story short, we find at the beginning, in our most elementary reactions, even at the level of the



reflexes and instincts and again in training and in intelligent performances unitary, articulate, meaningful wholes; to which we apply the name of Gestalt, configuration, structure. Development starts not with chaos or with a multitude of mental elements without order or meaning, but with structures, however primitive their character may be. Development proceeds by transformation of such structures. Gradually, by a number of smaller or larger leaps and bounds, we achieve different orders, different articulations, different meanings" (1)

Such a theory may well account for the speed and efficiency with which physical adaptations have followed opportunity and necessity. The wealth of individual experience is not heterogeneous in its nature. It is not static, and its mobility postulates a similar condition in the underlying physiological processes.

"Dynamical interaction undisturbed by accidental impacts from without, leads to orderly distribution, though there are no special regulative arrangements" (2)

Another feature, which does not depend on subjective experience alone for its proof, is the ability of organic life to concentrate its energy and attention in a single moment at one point.

Kohler says:

"All the resultant forces together form one texture of stresses. From the principles of physics one can deduce, therefore, that, for the system as a whole, the immediate effect of all those forces will have one definite direction. At each point the forces will produce changes of movement or process which, when considered in their totality, bring the system nearer to the balance of the forces themselves. The factor of inertia may cause the real course of events to deviate from the ideal exemplification of this principle. But where, as in most organic systems, inert velocities not corresponding to actual forces are destroyed by friction, the real distribution of processes will exhibit the principle perfectly, and will finally reach a state of stability, of rest or of stationary process" (3)

(1) "Psychology of 1925" p.141.

(2) "Gestalt Psychology" Kohler. p.139.

(3) "Gestalt Psychology" Kohler. p.139.

The effect of this distribution, alike enables amoeba to focus its resources to meet the surrounding medium in competent fashion and civilized man to exert that freedom of choice which is characteristic of life. The acts of a nursing infant are not due to the point-to-point correlation of stimulus and response but a single stimulus sets off a train of activity, guided by its mnemonic antecedents. In the physical world, undisturbed dynamic-interaction will produce an orderly distribution. Taking the neural structure at its face value as a mechanical system, it would be pre-supposed that there would here be a level of equilibrium also.

Subsidiary and analogous proofs of "dynamic distribution" are at hand. Every contact of organic life with the environment is a dynamic situation, all too inadequately explained by the reflex and the so called "laws of association!" The hormic nature of living things predicates that this should be so. As a result, the total context of experience is subject to strain and stress. The previous individual history is pregnant with significance for the present. The doctrine of Freud has not belittled the part which previously organized trends and complexes play in everyday life. From the viewpoint of an observer the present act can only be adequately explained by a knowledge of the conditions preceding and surrounding it. The individual is still further equipped, to act as a potential agent in a dynamic situation, by reason of his emotions. While it is true that the transference from one individual to another is effected by the

conservative method of sympathetic adoption, rather than that the effects themselves should be transferred, yet the emotions serve a purpose. Not only does the emotional disturbance of the agent attune his bodily functions to performance, but his associate is made a partner to the situation through the absorption of his companion's emotional tone. The lack of suitable stimuli and the consequent inaction, will, on occasion, lead to unhappiness. The potential ability to react and the bodily tuning in anticipation of an impending situation eventuates in internal strain which Graham Wallas aptly terms "balked disposition". The effect of mnemic traces in the life of the individual, in the history of the race and in every situation, in fact, can only be interpreted by an appreciation of the conditions under which they have been built up.

The way in which future action is anticipated, lends further proof that the method of distribution in neural action corresponds to the dynamic context of experience, and thus indirectly aids in establishing the import of the mnemic patterns. The operation of the nest-building instinct of birds will serve as an illustration. The behaviorist says that it is determined by pre-existing reflex-arcs established in racial development and transmitted downward. Now, this may for the moment be admitted, yet is it not true that these same adaptations were originally built up through contact with the surroundings, and though they are crystallized in the instincts, yet still maintain their dynamic import when asserted in actual operation? At a somewhat higher level,

the actions of "Kohler's ape" when in search of the fruit placed outside his cage indicate the manner in which one situation grows out of another and the way in which single objects obtain significance when incorporated in a total setting. "Sultan" is unable to directly reach the bananas. He goes in the opposite direction and thus initiates a new train of action. The branch of the tree which is utilized to reach the fruit, previously had no significance- but once it is objectified as the means of solution, it attains significance. One situation grows out of another and the factors that are present are charged, not only by their place in the previous context, but also by their bearing on the developing situation which is not yet completed. Only a few processes are used at any one moment of experience. Were this not true there could be no focusing in attention. As Kohler has said: " a word when heard does not call up all its many relationships but only those which have a place in the total setting." Irrelevant associations having been barred the circuit still remains open and there is only a general readiness or sureness for transition.

An attempt has been made to show that the theory of the reflex is insufficient to account for the facts of life. It has been suggested that all activity is self-motivated by the urge to act and hence to live. It has been concluded that all experience has a counterpart in neural activity and the nature of this relation both in present activity and in anticipation of the future has been described. These conclusions have a bearing on the part which the presence of "mneme"

has played, both as a conservative factor and as an agent progress. If dynamic distribution of forces occurs in activity, it is none the less true that the traces which are engraved are definite patterns. Remembered experience is always cast in certain settings, and the outlines which were the important parts in the original act persist in memory.

In action, the functioning of one habit prejudices the operation of all others. As in perception there is a focusing to meet the situation, so in habit formation this tendency has become crystallized and even in the repetition of the pattern, other elements tend to be excluded from the field. The presence of dynamic interaction results in a constancy in experience. The varying effect of a constellation of stimuli is modified by the activity in the underlying physiological processes. The result is an ordered world of experience rather in advance of the real external order. A similar situation prevails in memory. It would seem that no ordered survival of previous experience would be possible, were it not true, that the original experience fell along dynamic lines and as well, that the traces left in the processes should be in definite form. This outline at first is fluid but becomes firmed. The passage of time works certain changes in the patterns. In this connection R.M. Ogden says:

"This change, which takes place regularly, both in perception and in the residua of memory, as 'a tendency on the part of every configuration to become more simple and precise' may be called the law of precision.

Not only do perceived objects and the residua of memory undergo these alterations, but also dynamic

configurations in the apprehension of movement, and in the responses of bodily adjustment. On the physiological side, the condition of the organism called *tonus* is a general state of readiness for response, which serves as a 'ground' from which the so-called phasic pattern of the specific behavior arises. This behavior-pattern follows the same law of precision, and varies in the directions of over- and under- emphasis according to the conditions of re-arousal, just as does the reproduction of visual figures in memory" (1)

Confirmation of the place which configuration plays in memory, is seen in the way that an act is reproduced. This is best instanced in the operation of the instincts. The yucca moth performs a series of acts which while apparently purposive, are of so intricate a nature as to be inattributable to the effects of its own experience. The various acts unfold in a definite manner. It would be difficult to formulate an explanation based on the theory of mechanical interaction of single successive stimuli. As a result of the mnemonic antecedents, the individual on the one hand and certain situations on the other, become charged with potential significance for each other. Kohler says:

"In more than one example it was not so much an existing state of the self which we felt to be determined directly by the properties of a given fact before us, but a change of the self as growing out of something particular, just appearing in the field. Sudden fright at an unexpected event of a certain sort is an instance of this sort of dynamical determination. Again, when in climbing a mountain we reach a dangerous place, fear may grow out of the observation of the lay of the land where we must quickly take the next three steps. After these steps have been successfully accomplished, a feeling of relief will develop out of the situation, no less directly" (2)

Sub. Sec. "5".

The origin of the reflex is to be found by investigating

- (1) "Psychology and Education" Ogden. p.237.  
(2) "Gestalt Psychology" Kohler. p.379.

the ontogeny and phylogeny of the organism. Its nature and effectiveness have long ago been determined and embedded in the developing matrix, and it functions with little variation of performance. As the supreme accomplishment in the category of mechanical perfection and regularity, it has ceased to play any part in the initiation of adaptive behavior. It would appear that had the mnemonic traces been more definite, had they issued in reflex action, then progress would have ceased. Such has not been the case, and trends or patterns as general guides to behavior, have preserved that which was of value in racial experience and at the same time have allowed for the amount of modification which was necessary for complete adaptation. As if to insure the advantages of their repetition, the life of each individual is not only guided by the patterns of racial behavior but they occur and reoccur in rhythmic sequence. Of the variety of conditions which have contributed to an orderly world of experience, possibly none has played so large a part as that of rhythm.

The investigations of biology have fostered a consciousness of the presence of periodical stages of growth. In the same connection Nunn says:

"Rhythm rules in physiological activity, in breathing, in the circulation, in muscular action, in anabolism and katabolism. In many ways, obvious or hidden, the life of man moves obedient to the cosmic rhythms of the day and the year. It is natural, then, that the perception and creation of rhythm should be enjoyable and should, among other things, play an important role in evolution of art. It is not surprising to find that among primitive peoples the rhythmic element in music is often highly developed, while the harmonic and even the melodic element is still rudimentary. Much the same was true of Greek music and for the same reason-

namely, that the rhythm of music comes from the dance, and dance-rhythms are only physiological rhythms of natural movement elaborated and formalized" (1)

Zoologists have demonstrated the part played by the recurrence of similar forms in the evolutionary series. There is similar rhythm in the physical life history of the individual, and in the development of certain characteristics at a definite time. There is a parallel in the order in which the various instincts make their appearance. The physical changes attendant on puberty are accompanied by the appearance of the delayed impulses of sex. Nor is the presence of rhythm confined to the realm of physical development and the operation of the instincts. As Whitehead says:

"Life is essentially periodic. It comprises daily periods, with their alternations of work and play, of activity and of sleep, and seasonal periods, which dictate our terms and our holidays; and also it is composed of well-marked yearly periods. These are the gross obvious periods which no one can overlook. There are also subtler periods of mental growth, with their cyclic recurrences, yet always different as we pass from cycle to cycle, though the subordinate stages reproduced in each cycle. That is why I have chosen the term 'rhythmic', as meaning essentially the conveyance of difference within a framework of repetition" (2)

The emotional accompaniment of all activity and experience furnishes a fertile analogy. Nowhere is the cyclic rise and fall of the bodily and mental states more clearly paralleled. Elation follows depression and appetitive distress is succeeded by the satisfaction of repletion. The whole gamut of experience from the grossest bodily appetite to the finest moral judgment is reflected in the change of emotional

(1) "Education, its Data and First Principles" T.P.Nunn. p. 60.  
(2) "The Rhythm of Education." (London, Christopher; 1922, p.9.



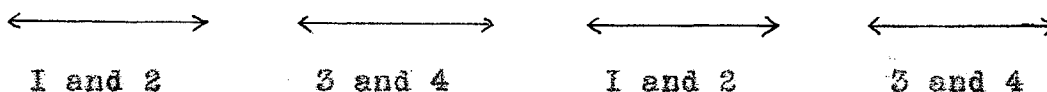
attitude. Unshackled by the details which are inherent in the pattern of every act, the emotion depicts a clearer and more regular outline and lends itself to closer observation.

Individual experience is influenced in a twofold manner. Both the present and the past furnish their quota of significance to the dynamic situation which exists at every moment of waking life. The configurations which have resulted from previous interaction are being constantly recast under the effects of the moment, wherein the environment provides the stimuli. The resulting distribution of forces is in accordance with the laws of dynamics, but at the same time the strength of the impinging stimuli contributes to the nature of that distribution and aids in the formation of other definite outlines. The total effect seen in retrospect is a series of configurations all of which are dynamically related. As a consequence of their nature and manner of formation, they in their turn, will recur at definite intervals as the developing cycle of existence demands their aid. The experience of a heard melody is a totality and its recognition depends on whether or not it has been previously experienced and also on the depth of the original impression. The fragments which compose the total pattern are themselves complete wholes and the pronounced rhythm which is present is due to the intervals separating the smaller patterns. The repetition of a single tone may be illustrated thus:

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A closer analysis of the experience will reveal the grouping proclivities of the processes and the larger whole may be

disintegrated as follows:



Every moment of experience is located in a context whose outline is ever changing, and the total field is divided and subdivided into forms of configuration which recur in cyclic order at definite intervals.

Sub. Sec. "6".

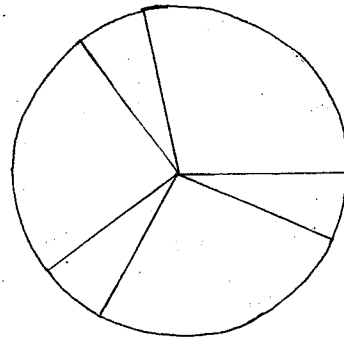
Perception implies a perceiving organism and the briefest consideration will disclose the limited possibilities of "reflex action," even with the aid of mnemonic factors, as being sufficient to account for it. The admission of dynamic distribution in the sensory processes is a long step in advance and one which goes the greater part of the way in giving an account of the phenomena of life. Such a hypothesis does away with the need of any central connection in the neural system. As a matter of fact, the opposing theory of behaviorism has not shown that human cerebral development has had any special significance. There is an enormous gap to be filled between the thousands of stimuli furnished by the object, and the meaningful unit which the same object denotes in experience. The "sensation" of behaviorism cannot be identified as a differential and its existence has never been claimed on other than a hypothetical ground. Since it is very doubtful if a combination of sensations can produce a true picture in experience, the reasonableness of the dynamic contention must be admitted. The remarkable fact is not that the sense organs are capable of stimulation, but rather that they have

the additional power of "self-organization!" The contentions of the structural psychologists which maintain the validity of qualitative and spacial patterns in experience, are instructive. With the recognition that common sense sanctions the acceptance of their views, it at once becomes possible to postulate the existence of similar patterns in the neural system. It is a useless procedure to mix matters by ascribing the recognition of form to mental activity enhanced by "sensory organization," as it is clearly a case of "putting the cart before the horse!"

At this stage no claim is made for a factor of "consciousness" and indeed it is not needed to explain the outstanding thesis of Gestalt Theory. The absurdities and inconsistencies of current mechanistic theory and the coincident common-sense observation of everyday situations has led to the formulation of this hypothesis. The individual is born into a world of matter and from the beginning of life his surroundings are ordered in experience. The progressive orderliness of the subjective field was formerly attributed to the activity of "mind," or to a mysterious process whereby the objects of the exterior world were reflected in the sense organs that, somehow, acted as a mirror. The plausibility of such theories having been questioned, they were supplemented by the doctrine of meaning. The effect of the interaction with the environment led to a consequent growth of experience and a wealth of associative bonds were built up with the result that each new situation was orientated by the previous contacts. A number of direct proofs, as well as the inferences based on

analogy are available to show that these explanations are not valid.

Below the level of conscious action- and indeed of meaningful action, a universe of organization obtains. Throughout life the surrounding medium is made intelligible by the activity which may be termed an "automatic organization." The individual confronts his world with an hereditary equipment which functions in perfect fashion. On opening his eyes he sees objects- not disintegrated light rays or sensations. Blind from birth and acquiring sight, he at the first instance distinguishes the contents of the field of vision as being comprised of objective entities. In all vision space forms stand out from the ground and it is neglected in favor of the dynamical context. A fixation of vision on the accompanying diagram will illustrate this point.



(Adapted from Kohler)

At the first inspection either pattern I. or form 2. will be seen and the one which is not brought into prominence is withdrawn within the ground.

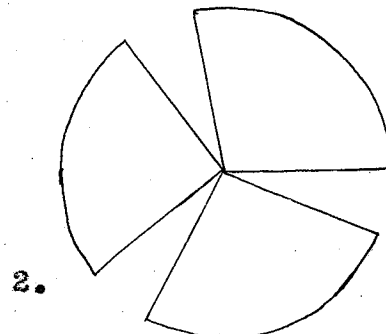
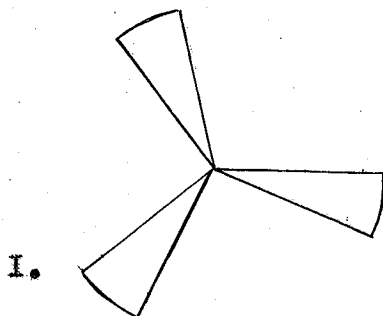


Fig. 3.



Fig. 4.

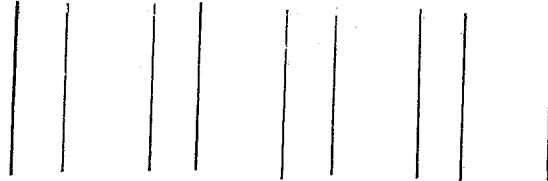


Fig. 5.

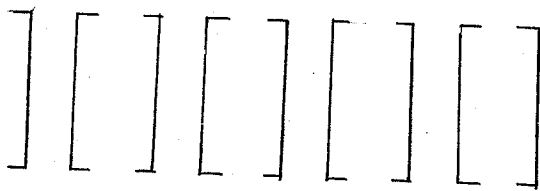


Fig. 6.

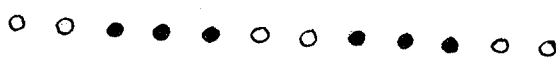


Fig. 7.

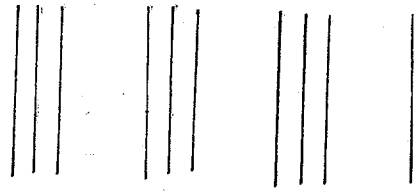


Fig. 8.

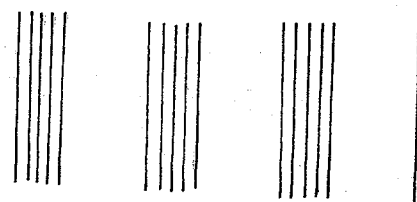


Fig. 9.

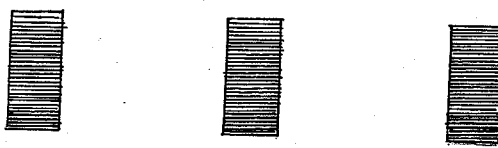
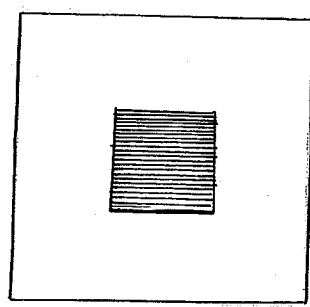


Fig. 10.



On continuation of attention each pattern will "stand out" alternately, with a consequent recession of the other, suggesting a state of indecision, or a competition of two agents for control of the field. A glance at Fig. 3. will show the tendency of such an arrangement of dots to fall into well defined and similar groups. The straight line of Fig. 4. shows an even more pronounced tendency in the same direction. With the addition of the lateral lines which are added in Fig. 5. the groups that appear spontaneously are more striking. The ordinary powers of concentration will hardly suffice to break this natural grouping into an artificial alignment. That the addition of the horizontal lines aids in the formation of the units, would seem to indicate that an enclosed unit or one indicating closure is more easily observed than one which is not. Another point of significance is revealed in a perusal of Fig. 6. Here the grouping is aligned on the basis of similar properties in adjacent units, and another factor other than proximity or distance is introduced. Here the distances separating each part of the group is uniform and the visual grouping is due to a different cause. With the addition of intermediate lines as in Fig. 7. the groups become more stable and if the process is continued as in Fig. 9. an extreme case is illustrated. The factors of distance and enclosure are climaxed by the perfection of the homogeneous characteristic of coloring. The result is the appearance of solidity. Not only are three separate units revealed, but the totality of units form a single pattern. There is a "standing out" from the uniformity of the white

ground. If one unit be present, as in Fig. 10. the appearance of "otherness" is enhanced by the absence of the extra members. Such an apparently disconnected number of observations stand in need of explanation. The following quotation from Kohler is pertinent.

"The fact that not the local properties of given stimuli but the relations of those properties to each other ( the total constellation of stimuli, to use a better word) are decisive for the formation of units, suggests at once the idea that dynamic intercourse in the field decides about what becomes a unit, what is excluded from it, what is 'figure' and what falls back as mere 'ground'. Indeed, at the present time not many psychologists will deny that, acknowledging those real units, etc., in the visual field, we have at once to draw the adequate consequences for that part of the brain whose processes are corresponding to our field of vision. The units, sub-units, boundaries, the difference of 'figure' and 'ground' must exist there as physiological realities!" (1)

The tendency toward grouping and enclosure is carried out in the case of a uniform pattern, so



may be seen



The underlying physiological process is not entirely "automatic" as has been suggested, since some brief time elapses between the visual fixation and the time when the ordered field is apprehended. Following its initiation, the activity proceeds to a definite end.

(1) "Psychologies of 1925" Kohler. p.179.

"If the local process in an extensive system is by dynamic intercourse in this system a dependent differential, it will change, and so will the process in the whole system, until equilibrium is reached in a stationary distribution without further change. We were treating visual fields in the state of rest. They must be the psychological correlate to a stationary equilibrium distribution in the corresponding processes of the brain. There are enough cases in physics where a process originating in a system under a certain set of conditions develops its stationary distribution in extremely short time. The time in which the equilibrium of an optic process is developed must also be rather small. Because, if we give a set of stimuli suddenly, say by projection, the phase of 'something happening' which we observe, has an extremely rapid appearance, and in a moment we see the field, its units and their forms at rest!" (1)

For a long period of time the theory of a rigid and unbending system of neural connections has prevailed, and while the arguments deduced in support of the contentions of "Gestalt Theorie" are important and interesting, yet the point which is of greatest concern to this thesis is the admission of the presence of organization in the field previous to experience. As an example of the attempt to trace the physical cause of dynamic distribution let Kohler be again quoted;

"In consequence of unequal stimulation in different areas of the retina, different areas of a cross section of the optic sector contain unequal chemical reactions and so contain unequal chemical material in crystalloid and colloid form. If these unequal areas are in functional contact, they certainly are not in equilibrium. There is 'energy able to work' in the system wherever areas of unequal properties have common borders. Here in the contours must be the main source of energy for dynamical intercourse. It would be so in physics or physical chemistry under corresponding circumstances." (2)

Such an argument is rather beyond the scope of the present discussion, and the reasonableness and necessity of the hypothesis can be established by general inference enough

(1) "Psychologies of 1925" Kohler, p. 184.

(2) "Kohler, Die Physischen Gestalten, etc." p. 185.



will have been accomplished.

The primitive group formation which results from the action in the processes, is not confined to the visualization of "flat" patterns alone but applies alike to objects of extensity. If the question be raised as to why there is, as a rule, a correspondence between the objects of the external world and their optic counterparts, it may be answered by the very general reply, that both the environment and the perceiving organism being genetically related, the evolution of the neural processes has taken place under constant contact with the external world. The continuation of the correlation is ensured by reason of the homogeneous nature and similarity of outline which characterize like objects in nature. Man-made objects are generally so constructed that they correspond to the patterns into which they are fashioned by the neural processes. The entry into the living quarters of a comfortable dwelling results in the feeling that all is appropriate, and that things are as they should be. The mistress does not place the various articles in a haphazard fashion or even in order of convenience, but rather in a definite way, in balancing groups. in short, everything is "in its place." The practice of "camouflage" practiced extensively in warfare depends on the principle of fashioning objects in such a way that they do not conform to optic realities.

It is a doubtful procedure to ascribe the orderly nature of experience to the meaning which accrues in the course of an individual life. The assertion that experience consists of the entry of meaningful relations is quite true,

yet without the basis, which is present by virtue of heredity, no experience would be possible. At best, it would consist of the blind gropings which are present in the most elementary organic forms. Man's status at birth is like the entry of an European into a forbidden city of Thibet. The dress, the customs and the temples, are strange and the language is unintelligible. All the primitive requisites necessary for an understanding of the situation are present but the meaning and interrelationships of the presented scene will only become clear through his activity of investigation.

The accretion of meaning rests on the basis of ready formed configuration, and in an analogous fashion the validity of the total unit patterns in the processes rests on the presence of the smaller elements of which it is composed. The traces of functional wholes are themselves detached wholes. While they are merged in the whole pattern, they at the same time exist as smaller totalities. Such a whole pattern as Fig. II. is an optical reality and Fig. I2. may or may not be seen.

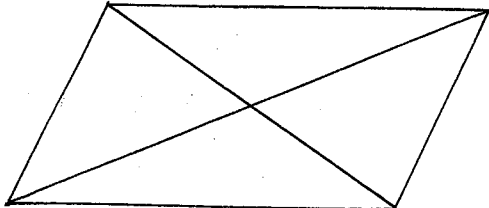


Fig. II.

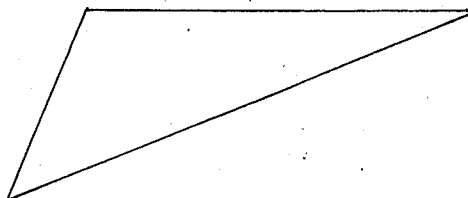


Fig. I2.

Such an outline as Fig. I3. will more likely be observed,

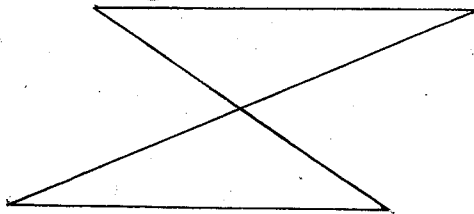


Fig. I3.

but the significance of either- though the same constellation of stimuli are present as when incorporated in the whole pattern,- is hidden by the predominance of the total configuration. A mutual interdependence of part and whole prevails. Where the part is taken initially as a single unit, it in turn, depends on the presence of smaller functional parts, and at the same time robs them of the significance which they would attain, if existing in isolation. Such is the fate of the part when incorporated in an ascending order of integration, but a necessary one if progress is to prevail!

While the foregoing analysis of the interdependence of whole and part supplies direct evidence of the dynamic relationships involved in the composition of the patterns, it is not the only proof. To go back of the effects of distribution, it may be observed that there is a mutual interaction in the field of the forces themselves. Hasty walking attunes the whole organism and fosters rapid thinking. A search with the aid of the eye is paralleled by a keenness in the auditory field. Kohler describes the tempo of experience as follows;

"Quite generally the inner processes, whether emotional or intellectual, show types of development which may be given names, usually applied to musical events, such as: crescendo and diminuendo, accelerando and ritardando. As these qualities occur in the world of acoustical experiences, they are found in the visual world too, and so they can express similar dynamical traits of inner life in directly observable activity."(1)

Another proof of the importance and force of configuration in the neural equipment is still further evidenced. As will be contended hereafter, mind is a very real element

(1) "Gestalt Psychology" Kohler. p. 248.

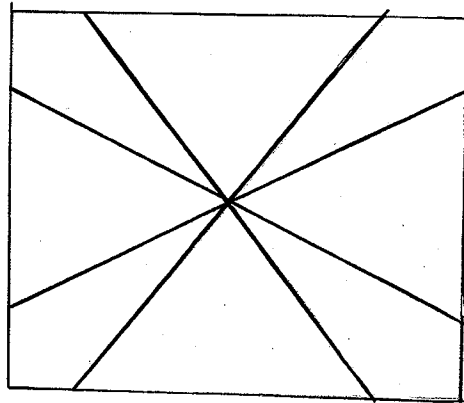
in determining a course of action, yet the inherited sensory patterns often form an opposing barrier to this lately acquired agent of organization. Instinct, will, on occasion, override the dictates of reason. The fond father, knowing that the guilt of his child is most probable, at the same time persuades himself of its innocence. Lawyers, in a preponderance of cases believe in the justice of their clients' claims. Similarly, in numberless instances the patterns of inheritance or experience determine a course of action which cold reason would condemn.

A comparison of the relative completeness of inherited patterns of behavior furnishes a standard for judging the advancement of the human infant. The cretin comes into the world with patterns which are incomplete, when compared with the normal infant. In this connection Ogden says;

"Why should not one thing, or one way, be as good as another? Why is not the defective child with his crude nursing as good as a normal child with his self-regulating perfection of behavior? As a matter of fact the behavior of the defective child is quite as true and quite as real as the behavior of the normal suckling. Yet by comparison the behavior of the normal infant is somehow richer, fuller, livelier than that of the defective?" (1)

Such a statement of fact has value, since a comparison with the other parts of the total dynamic context furnishes a standard for judging as to what is good and what is bad.

Taken on a higher plane, there is a grouping process in memory. Details are forgotten, or rather, merged in the ever enlarging configurations, and the new groups tend to be displaced toward the average. It may be noted that this (1) "Psychology and Education" Ogden. p. 15.



(Adapted from Kohler.)

is in accord with proven facts. In the course of evolutionary development the majority of the items encountered have been near to this average. While there need not be agreement with the terminology employed, attention to the following quotation from Graham Wallas is instructive. He says:

"If, again, a man is told to learn by heart a long list of numbers he tends automatically to form them also into groups, and the numbers in each group are 'displaced in memory towards the average' of each group.

In these cases, therefore, of colors and numbers, the answer to the old question of priority between the individual fact of experience and the general idea, is that the fact is prior to the idea, and that the idea arises from the grouping of the facts in memory; the points round which the grouping takes place depending on the circumstances of each case. It will be convenient to call ideas so formed 'artificial' (1)

The patterns (ideas) are indeed artificial, if the "automatic organization" accomplished by the sensory processes as an aid in making the environment intelligible, may be so described.

The further distinction which he indicates when he says:

"But in other cases an idea crystallizes round a point which is fixed beforehand by some inherited disposition, and then it may be convenient to call the idea 'natural' (2)

is a matter of arbitrary classification. It is inconsequential whether or not the hereditary patterns be distinguished from those of experience. The important point, is the accomplishment of the organism in the production of this conserving device which allows an ordered experience of an otherwise complex world of multitudinous unrelated factors.

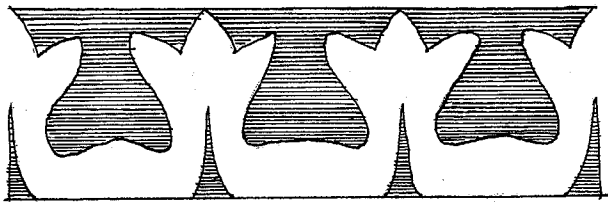
Sub. Sec. "7".

Madison Bentley has said the "comprehension or understanding is a kind of acquisition". There is an element of

(1) "The Great Society" Wallas. p.199.

(2) "The Great Society" Wallas. p.200.

truth in such a statement but at the same time it is not an adequate account of "meaning". It has been previously contended that progress is due to certain hormic strivings, and that the consequential interaction with the environment results in progress being made. No advance would be possible however, did the organism not possess the unique power of recording its experiences. The vague mnemonic tracings occasionally issue in the well defined and machine-like reflex. This not being sufficient to cope with changing surroundings, the development of an elaborate neural structure provided a vehicle whereby the ceaseless outward change is paralleled, and reflected in experience. Even yet the world does not become intelligible, and it may be presumed, that, at a somewhat later time, 'ere the system providing for the distribution of forces was complete, a new and unique element appeared as a supplementary agent. An object or situation is, to a certain degree, known at the moment it comes within the field and the more perfectly that it coincides or is related to the previously existing configurations of the subject the more certain is the recognition. It is true that meaning is entirely dependent on this elementary coincidence of the external objects and the neural attunement, yet it is in a manner unique and different. The further experience which follows the initial contact is another stage of advancement. The process of change within the patterns and the establishment of a multiplicity of interrelationships takes place. In short, experience of a higher sort supercedes the primitive organization. As has



(Adapted from Koffka.)



been pointed out before, it is this ability to profit by experience which marks off organic life from inanimate matter. An example may make this point clearer. An unfamiliar object seen in twilight often takes on swiftly changing contours as the stimuli fall first into one incomplete pattern, and then another. After a moment's hesitation, recognition takes place, and you exclaim, "oh it's a sheep!" Following the recognition, the whole meaning implied breaks in upon you, all that you know of sheep, your knowledge of their habits, the bit of conversation overheard relating to the loss of this particular animal by your friend. It must not be inferred that the emergence of "meaning" has awaited the complete evolution of the neural system- but rather that at an early date the unique accomplishment of the modification of automatic grouping entered as an aid, and that the emergence of meaning is but a relative factor making toward the ever more perfected process of orderly distribution.

The orthodox disciple of Gestalt does not clearly distinguish the point at which meaning enters in the cycle. When the question is raised, it is ordinarily placed as following perception and after organization is complete. The contention here set forth is somewhat different and it adds to the reasonableness of the account to credit the development of "meaning" as a potential agent tending toward the extension of organization. A truth concept is partially established when the objective group is seen. It does not become fully established until "meaning" alternately leads and follows in the process of realignment,

till the truest possible concept under the existing circumstances has been established. Thus "meaning" on the one hand, implies more than mere reconstruction of the patterns- and may rather be termed the "effect in experience" of the rearrangement. On the other hand it is not identical with the potential factor, "mind", whose emergence it forecasts.

The psychic-stimulus theory enunciates a partial truth only. That "mind" supplies meaning from its inner resources may be admitted, but as automatic grouping in the processes (and consequently in experience) did not await the advent of meaning, so in analogous fashion, meaning in its primitive appearance has not been dependent on "mind". Let a practical illustration be introduced. A child is making his first attempt at reading. It has been ascertained beyond question that there is a definite "natural eye span" and the number of fixations in each line is depicted in (A) of Fig. 14. It may be noted that it is not purely a question of eye-mechanics which determines the length of the fixation, otherwise such a variation in length would not be evident- rather, it must be inferred that the inherent patterns in the neural structure influence the size and composition of the unit which is selected. The eye moves from group to group and recognition takes place in the intervals. A child whose natural eye span is "broken" through faulty procedure on the part of a teacher is ever after unable to regain his original capability in this direction and is condemned for life to be a "word reader". That reading may take place without any meaning whatsoever entering in, is a fact that

any primary teacher knows. It appears that meaning is not necessary for the mechanical recognition which takes place on the basis of "automatic grouping" and the "machine-like" recognition which ensues in the intervals. In contrast to this is the orientation and progress which is evident when even a faint glimmering of true meaning enters. A transformation is effected, and while it depends on a more primitive acquirement, yet at the same time it is so different as to mark a revolutionary stage of advance. Though this is true, the pupil is still a passive agent and displays none of the characteristic resourcefulness or purpose which attend the functioning of mind as illustrated in adult life situations. The oft-used illustration of memorizing a series of "nonsense-syllables" is familiar. There is a definite limit to the number which can be learned off-hand. In the usual method of acquirement the factor of meaning or artificial grouping does not enter and the smaller units into which the series is unconsciously broken, suffices. If the material be of greater length too great a strain results and an artificial regrouping has been found efficient and necessary as the basis of mastery. Involuntary organization serves as the basis and it is furthered by the entry of even a minimum of meaning. Directed attention and attitude are the highest factors of value as they are the last to be called on for aid.

Gestalt Theory opposes the mechanical assumptions of behaviorism with weapons fashioned of similar stuff. By its advocacy of dynamic relations as governing the physical

correlates of experience a foundation has been constructed that is reasonable and that will serve as a practical basis for future progress. At the same time it is not an all-sufficient explanation. Many suggestions have been made in an effort to explain the unique accomplishment of man in the use of language. Throughout, there has been a disregard of an essential fact, viz; that words only have significance as they carry meaning. Doubtless the principles of Gestalt Theory are involved in an adequate account of the origin of language, but at the present time the conclusions of behaviorism are undisputed. Here is a fertile field of inquiry, for the acquisition of language is poorly adapted to illustrate the principles of behaviorism, and on the other hand cannot be fully explained without recourse to a broader basis such as that furnished by the dynamic theory. Development is not limited to a mere totalling of individual factors, but depends on an orderly process of incorporation which is nowhere more apparent than in the growth of language. Until the present time the disciple of "Gestalt" psychology has been engaged in refuting the obvious inconsistencies of "mechanics" and the far-reaching consequences of "his theory" have not yet been fully appreciated.

Sub. Sec. "8".

There is an undeniable element of truth in the results achieved by exponents of the theory of "association" and these results have been sufficiently impressive to secure the too-ready and general acceptance of the so called "laws" of reproduction, as Kohler says, is made to

"depend upon the specific location of paths and nuclei in each particular case, as though such simple location were a true representative of definite process. Only if this were so, might a theory of reproduction become a purely topographical matter. In the optic sector of the nervous system, at least, a given process may be conducted in one bundle of fibers at one time, and another process may be conducted in the same bundle shortly afterwards. Furthermore, the same process may be conducted in certain fibers now, and in other fibers later on. Therefore, the necessary requirement for making the machine theory of explanation possible is not fulfilled in the case of our most important sense organ. In the optical system the correlation between the different kinds of process and the different localities in which they may occur is very near to zero. This should destroy all hope of treating reproduction exclusively in terms of topographical conditions!"(I)

Without a sufficient time for the study of the hypothesis from all possible angles, rather far-reaching conclusions have been drawn entirely on the basis of certain observed results.

The investigations carried on largely by experiment on animals, have established curves of learning for various types of activity, ranging from the habits of "the dancing mouse" to the actions of mutilated rats finding an exit from a "maze." The experiments performed with humans have been little more enlightening. In both instances a true conclusion has been drawn, viz: that progress in these types of activity is largely due to the growth of motor or kinaesthetic habits. The further assumption that all learning is confined to this type of acquisition is quite unwarranted and cannot be proved to be true. Where a minimum of meaning is involved the arranged situation is the principle moulding agent. The remarkable similarity evidenced, for example, in the "Learning curves" of archery practice, in typewriting, in the pecking habits of chickens and the memorization of nonsense material,

(I) "Gestalt Psychology" Kohler. p.346.

is quoted as proof of an overworked theory. It is not recognized that these various activities are instances of a lower stage in the scale of organization. Instances of a higher type of activity are shelved on account of the danger to the theory of admitting an element of meaning or the effects of previous experience. The spectacular advance which is made on a higher plane of activity is reflected in a comparison of such curves as in Fig. 15. and this the "laws" wholly fail to elucidate. So predictable is the progress that may be expected of "motor" learning, that norms have been set up in order that the minor variations from the standard may be recorded.

While recognizing the value of investigations so carefully carried on and recorded, it would be more reasonable to exercise caution in drawing conclusions from them. "Association" should be admitted- but only as the after-effect of the process of dynamic organization. In the reproduction of a series of syllables such as "lar- nun- sid" the syllable nun will suffice to "call up" sid. If the series be not quoted as a whole, this is not the case. Sultan, before mentioned, turns away from the fruit outside his pen and directs his attention to the tree whose branches he utilizes to secure the food. The associationist cannot explain why he does not continue to press his nose against the bars forever, and neglect the tree. On the assumption that the continuity of attention is determined by the totality of the situation, the explanation becomes clear. In every-day life, each reaction to a suggestion is not evoked by a single element or a selected class but is connected with the total context

prevailing. If someone near repeats the number three, the number four is not necessarily brought to mind and references is just as likely to be made to the time of day or the inches of snowfall, all depending on whether the discussion has been about the weather or the arrival of the afternoon train.

Sub. Sec. "9".

The inference of Dr. Watson that habit formation is purely a mechanical process is open to question. Just as there is no definite line of demarcation which would indicate the time at which meaning makes its appearance as an aid to the primitive organization effected in the processes of perception and motor response, so the line marking the separation of habit formation from the stage where intelligence lends aid is equally vague. Indeed, such distinct periods of evolution do not exist and better conception is that of a graduated scale of progressive attainments each shading into the other. Speaking of Thorndikes' experiments performed on animals wherein he concluded that their actions were essentially stupid, Koffka says:

"These curves show not only a sharp descent, but no recurrent rise even after a long interval of time; a result which also contradicts the law of exercise, since a long pause ought to weaken the bonds previously established. Why should we not proceed from cases like these, and lay our emphasis upon the suddenness rather than upon the gradualness of learning? The gradual type of learning, however, which Thorndike found in most of his experiments impresses him so strongly that he dismisses sudden learning with the remark that 'of course, where the act resulting from the impulse is very simple, very obvious, and clearly defined, a single experience may make the association perfect, and we may have an abrupt descent in the time-curve without needing to suppose inference! But the position he takes is open to objection, because the description of a solution as 'simple! obvious! and 'clearly defined'

can apply only to the experimenter and not to the animal. According to Thorndike's own presuppositions the animal does not participate at all, nor does it even understand the solution after it had been mastered; and hence there can be no point in saying that the solution is 'obvious' to the animal. The time curves we have reproduced will indicate how differently different animals behave in the same situation; yet Thorndike is unable to refer to individual differences, because the individual has been excluded from his theory. Therefore, whatever is 'simple' or 'obvious' can only include that which is 'objectively' simple or obvious, and not at all that which is simple or obvious to the animal!" (1)

again, he says:

"The fact that in these experiments a sudden fall in the time-curve ever should occur, and that it sometimes happens that an animal is able to master its task in a single trial, are matters that can not be simply brushed aside when they do not agree with the law of frequency, which requires a long and troublesome development even for the objectively easiest tasks. Since in the initial trial a single response must always be selected from among a large number of equally possible responses, the law of effect is, therefore, the only one upon which the explanation can be based, and we have already seen that this law is itself in grave need of elucidation!" (2)

If the proposition be accepted that habit formation constitutes the whole learning process in animals, and its corollary be admitted that it is therefore essentially non-intelligent, the additional inferences that have been made are not necessarily valid. Human action is not to be explained so easily, nor the philosophy of man's destiny determined in such summary fashion. "Back to the animals" becomes the slogan, and "exercise care that they be of the lower orders." The ability of the primates is illustrative. Without the use of language- and hence according to the behaviorists devoid of thought- they give evidences of an advanced mental

(1) "The Growth of the Mind" Koffka. p.164.

(2) "The Growth of the Mind" Koffka. p.165.



development. They display all the capabilities of the lower animals and possess the "motor memory" that characterizes life wherever it exists. In addition they possess a type of memory and an activity in adaption that forecasts the unusual powers of man. While it is probable that only man has evolved the dynamic concept of "self", yet this is not sufficient ground for asserting that animal behavior is entirely non-intelligent. That all sub-human activities are confined to the formation of motor habits, that their only method of advance is by a crude method of trial and error, that nowhere does meaning enter and that nowhere does intelligence guide- these are propositions whose acceptance common sense will deny.

Sub. Sec. "IO"

Meaning, though always present following the first faltering steps of progress, finally emerges, and in man it becomes conscious and real. Mind, and thought as its product, are the outstanding agents in the clarifying and ordering process that issues in such a result. The origin of mind, and the metaphysical arguments deduced in support of its existence are not of primary concern in this thesis, and the common sense judgment that it is a very real force, and that it is rightly deemed so by reason of its accomplishments, is accepted in lieu of disproof. With this ground established it will be profitable to make certain comments on the nature and functions of this, the most remarkable capacity developed by organic life.

Whatever else it may be, thought is not identical with

speech. The importance of the acquirement of language is recognized as being of great moment, but the coincident denial of mental activity is in the nature of a subterfuge. The mastery of speech is an accomplishment which is well nigh perfect, yet there is no reason why the thought processes should be made identical with sub-vocal language. The strict dependence of a large part of every-day thought on such a relationship is evident, and the parallel growth of mental activity and language mastery has not been the result of mere chance. A rich and well developed speech is characteristic of those races which are possessed of mental virility and a paucity in language development is rightly taken as a mark of inferior intellectual ability. The offspring of the African negro born in America does not show a marked increase in mental capacity even though the wealthy heritage of the English tongue become his and displaces the crude dialect of his forebears. The claim that a movement of muscular mass always accompanies the sub-vocal speech which behaviorism makes synonymous with thought, is probably true. James has indicated the manner in which the processes of active thought effect the heart and its circulatory system. Even though these physical correlates be always present, other conclusive evidence would be needed to justify the acceptance of so inadequate and superficial an explanation. It would seem that at best, the physical adjustments are but the effects of mental activity and it is not in accordance with the conservative nature of the processes of organic development to discard entirely the

instrumentalities of an earlier epoch. Rather, it should be recognized that this is a further instance of the incorporation of the old into the new, another case where a fitter adaptation makes use of a cruder means. That the thought processes of civilized man depend largely on sub-vocal speech, must, as has been said, be admitted and at the same time it should be allowed that the use of language aids and sustains a mental alertness by reason of the wealth of meaning which words carry. Though it be true, that speech is the instrument by which thought is furthered, still these two factors are not identical. The outstanding cerebral development in man is a sign of the perfection of the physical means of progress, but that mental activity and its physical correlate are categorically linked, need not be assumed. In a similar manner the language "habit" doubtless rests on an instinctive basis and has been nurtured through constant contact with the environment, but that it is not essentially enhanced and furthered, and in its highest manifestation- even due to the activity of mind- remains a possibility which cannot be easily disproved. A clear conception would make plain the function of mental activity as the important factor in language development, relative to the actual physical adjustments, that are necessary, though largely incidental- and which are in no wise the chief cause of humanity's greatest achievement.

If it be concluded that thought is not identical with language, it becomes necessary to go farther afield, and since there is no possibility of direct observation of mind,

inference and analogy coupled with a study of the products of mental activity, form the only avenues of inquiry. Though it be intangible, it is nevertheless a real agent, and the presence of a high degree of organization would seem to imply its influence. There must be no misunderstanding here.

McDougall says:

"This fact, that the mind is active in perception, supplying from its own resources something very essential, over and above the sensory qualities with which it responds to sense-stimulations, this fact is occasionally brought home to us very vividly by some such experience as the following: As I walk quietly through the forest, something, probably some slight movement or sound, provokes me to gaze curiously in a certain direction. There before me is a confused patchwork of light and shade and color, which, perhaps, I perceive as a rock partially concealed by foliage; until suddenly, without any change in the sense-stimulations I am receiving, I perceive an animal standing motionless gazing at me; the patchwork of light and shade and color has resolved itself into the animal; or rather, my mind, working under the impulse of curiosity, has suddenly found a richer 'meaning' in the confused visual impression" (I)

Such a reference implies the presence of a vague and unlimited ability. It has been previously pointed out that such a measure of organization has definite bounds, and that while efficient, is of a lower level. It is a primitive acquisition and though its recognition has been long delayed, at the same time this does not justify the claim that it is the outstanding aspect or achievement of the operation of mind. The view as defended in these pages, does not presuppose the entry of the mysterious factor "mind" at a certain time, but rather its presence is implied alike, in the activities of the lowliest and highest organic forms of life. Only in man

(I) "Outline of Psychology" McDougall. p.246.

does it break through in the supreme achievement of self-consciousness. Even at a lower level of attainment it is present as an agent making for organization and harmony, and to describe its nature in the light of one of its primitive accomplishments is to allow the surprise of a new discovery to cloud the vision. The argument for the potentiality of mind as an organizing agent is founded on the assumption of the validity of mind and the acceptance of the common-sense judgment that it is a real force exercising a tangible influence. Man thinks, and as a result of his thought processes he is a more efficient agent than any sub-human organism. That human accomplishment so far surpasses the highest animal attainments lends proof that the degree of organization effected by mind is of a higher sort than that ordering which results in mere animal perception. It is probable that man alone has the ability to think logically, and in the last resort this is the final test. No agent other than mind can account for the orderly distribution of such diverse relations as those which are encountered, and mastered, by present-day civilized man.

The effect of mind on the operation of instinct and habit is significant. An instinct is an hereditary pattern of behavior and, as will be shown later, it is no unimportant factor as a preserver of the racial attainments. It owes its genesis to original acts evoked by vital needs and environmental pressures in the race history. The manner in which intelligence cooperates with the unfolding of the instinctive patterns is a parallel of the way in which those traces were

originally derived under the influence of the hormic urge. Nowhere does the operation of instinct rule supreme, and from ammophila- to man, the course of experience guided by intelligence, acts as modifying influence on the simple operation of instinctive behavior. Higher up in the scale of organic forms the cooperation becomes closer and more unified, till the stage is reached wherein the acts of intelligent behavior entirely supplant the automatic responses that follow the outlines of the patterns of instinct. There seems to be a definite relation between the role which instinct plays and that behavior which is guided by the operation of habit. During the life-time of the individual the patterns of instinct are largely replaced by new reactions which become crystallized in habitual lines of action. At the inception of a new habit the factor of intelligence plays an outstanding part, but once the perfection of the new mode of behavior becomes established, its influence is minimal. The more closely that behavior falls along the line of the instinctive patterns, the less is the influence which intelligence and habit formation exert. It would appear that the operation of instinct is in inverse ratio to the capacity to form habits of action. In man, the promptings of instinct are strong, but the lines of their execution are ill-defined and the consequent modification which habit and intelligence effect, serve to preclude their primitive fixity of operation. Man exemplifies the manner in which instinct and habit are on all sides subject to reorganization at the supreme dictates of intelligent self-governance.

A discussion of the relation of mind to the operation of "mneme" will illustrate the importance which attaches to the emergence of mind as the outstanding achievement of man.

McDougall raises a pertinent question when he says:

"Yet, if 'memory' and 'habit' are identical functions, the reproduction of the sensory pattern must be regarded as dependent upon a multitude of neural links of the same order as those few involved in the motor habit. How, then, are we to account, in terms of the hypothesis, for the immense superiority of sensory to motor memory? Facts of this order seem to me to constitute in themselves an insuperable objection to the hypothesis of the identity of memory with motor habit.

The common assumption that 'habit' and 'memory' are fundamentally identical functions and both alike explicable by the principle of 'association' (understood in terms of paths of low resistance in the brain) is then highly disputable on the face of it!" (1)

Here the distinction between motor and sensory memory is made. According to the view taken in the previous pages the point is rightly taken and while the former is of a more primitive origin than sensory memory, it is also of lesser value. The patterns formed during perception have their counterparts in recall, but even they are not synonymous with the highest type of memory which corresponds to the processes of "directed thought." In a general sense memory makes meaning possible and it is also true to say that when this high stage of development has been reached the presence of meaningful relations enhances memory. No such clear distinction can be made, as that which would differentiate the type of kinaesthetic memory which depicts the primitive mnemonic traces, from the visual and acoustic memory formed in patterned outlines through dynamic interaction, or from the

(1) "Outline of Psychology" McDougall. p.300.

highest type of recall that depends on the volition of the individual and whose strength is in proportion to the degree of intelligence. It should be observed that there is a similarity of cause throughout, and an approximate relation in functioning. It is absurd that one stage of memory should be branded as "mental" and another as being of the physical order, since all are accomplishments of the whole organism with its total resources.

As was intimated in the previous paragraph, the attitude of the subject is of paramount importance. If this is true in the case of recall it is of still greater import in the original learning process. Bentley says;

"To be 'in attention' only means- so far as mind itself is concerned- to be clear and organized" (1)

It is here that volition, which the developed mentality of man makes possible, is of greatest importance. The voluntary attention of the moment may become integrated in a fixed attitude and insofar as it is self-directed and the offspring of individual choice it becomes a true determining agent in a dynamic situation. The subject by his display of a definite determination in the face of a situation that demands overt action, asserts the autonomy of his nature. Nowhere does the presence of mind make itself more felt than in the persistency with which an unfinished task intrudes.

"The following experience is common: I have a task which, perhaps, I do not like, but which is urgent. In the course of the day I find myself occupied by a great many other things. I talk with friends, read a book, and so forth. But time and again something like a dark pressure appears somewhere in the field and,

(1) "The Field of Psychology" Bentley. p. 172.



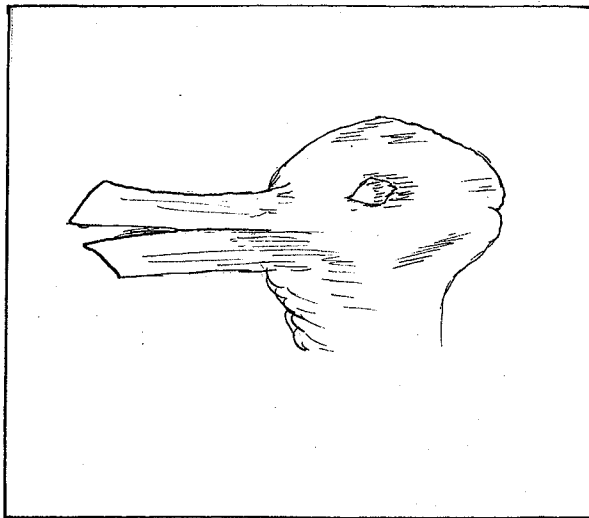


Fig. 18.

(After Fliegende Blatter, from Joseph Jastrow. Fact and Fable in Psychology.)

(Adapted from Bentley.)

if I examine it, it will be found to issue from that task. Here we have a persistent tendency toward reproduction, or reappearance in the actual field, and this perseveration seems to depend upon the particular nature of the trace in question." (1)

Concentration is demanded in the endeavor to follow a given course of study or in the search for the solution to a problem. Were the mental activities not guided by the principles of dynamics in a manner similar to that in which the hormic stirrings of a lower level were shaped, it would be difficult to understand why the "general" impulse to pursue the task should not follow off on the track of the numerous irrelative leads. Kohler says:

"If, even then, I am occupied with a given thing at a given moment, a great many 'deflections' of attitude will occur in the course of time until finally the work itself begins to be the development of one functional whole. What about reproduction during such a happy period of work? All the words and concepts occurring in the work itself are associated with other words, concepts and situations which have nothing whatever to do with the development of the work in question. These associations belong to very different epochs and interests in my life. If each of them automatically led to the appropriate reproduction, the field would become a chaos of incoherent stuff in a few moments, instead of one identical whole transforming itself in an orderly manner toward the solution of my one actual task." (2)

Every situation is, to a great extent, influenced by the predisposition of the organism. This is often apparent in vision where the operations may be easily observed. Speaking of Fig. 18. Bentley remarks:

"Suppose that you are suddenly confronted with the duck-rabbit picture. Whether you see the duck or the rabbit will usually depend upon the way in which you are disposed. If you had been shooting game-birds just before you sat down to read, the chances are that the duck would have first appeared. On the other hand,

(1) "Gestalt Psychology" Kohler. p.329.

(2) "Gestalt Psychology" Kohler. p.337.

anything which disposes you toward the perception of a rabbit would have turned you the other way" (I)

If this is true of such a relatively simple situation, would it not seem reasonable to credit the attitude which a self-directed agent brings to a more complex situation, as having at least as great an amount of influence?

The word "consciousness" has been used in such a variety of ways that its employment demands that it be accurately defined. It is here used to signify that concept of "self", thought of in dynamical relation to the environment. When the individual has reached the height where he is enabled to survey himself in his true relations with others, the dynamical relation is qualified and his acts as an independent agent take on new meaning. By reason of his appreciation he is able to direct his own destiny and to conquer new situations, while the actions necessitated by further encounters with similar conditions are relegated to the level of habit. All learning presupposes the existence of hormic activity, and the conscious apprehension which ensues only follows the increasing organizations of unrelated elements. Understanding is the essence of the ideal accomplishment and the instrument that will best suffice to abbreviate and hasten the processes of integration. The definition of an object which a child gives is invariably in terms of use and his primary consideration is therefore that which is related to this meaning. Koffka has said that a theory of meaningless learning is untenable and the truth of such a statement seems obvious. If it be admitted that meaning or understanding is essential for the adequate progress of the learning process,

can one disagree with Hobhouse when he says:

"Our argument then has led us to conceive Mind, whether in man or brute, as part of a psycho-physical structure which grows under the conditions of heredity and is modified in each individual by experience. This structure reacts in accordance with the laws of its constitution to that part of the environment with which it comes in contact, in such a way generally as to adapt the actions of the organism to the needs of race-maintenance. The method of adaptation in which Mind is specially concerned is the correlation of one experience or one act with others, and we may regard all such correlation as partaking of psychological character. Its special organ is consciousness without which new correlations are only effected indirectly and cumbrously. The development of Mind can accordingly be measured by the nature of the correlations effected and the conditions under which they are effected, and in comparing these we shall find every gradation from the case where the activity of consciousness is at zero, to that in which it is the effective determinant of the entire function" (1)

The primary test of "consciousness" is its practical efficiency and it is the results that it accomplishes which gauge its importance. A train of mental activity is a continuity and as McDougall says:

"There is a further peculiarity of mental activity which is commonly discussed under the head of attention, namely, the fact that a train of mental activity has, not only conative continuity, but also conative unity. The fact is sometimes expressed by saying that we can think of only one thing at one time, or can do only one thing at a time; or, again, it is said that 'consciousness' has a narrow focus, so that only one 'idea' can be at the focus of 'consciousness' at any moment" (2)

As it has been remarked, the agent, conscious of his dynamic relations with his surroundings is able intelligently to direct his own attitude- and his thinking becomes an ordered process wherein the total of his previous knowledge is brought to bear on the problem. By his conscious endeavor

(1) "Development and Purpose" Hobhouse. p.39.

(2) "Outline of Psychology" McDougall. p.277.

and aware of the part which he himself plays, his mental activity becomes of such an effective and pregnant nature as to far surpass any previous attainments. He is capable of anticipating the future and the "eternal ideals" which Plato extolled, may become very real goals toward which he progresses. Such a distance do the presence of mind and the concept of self indicate in the gap between the potentialities of inert matter and man as the embodiment of the "urge to live": "the owner of a soul," or "the dwelling place of a spirit! "

There are but two ways in which life may be interpreted. It may be viewed as a mechanical process in its entirety as behaviorism has done- in a manner which allows of no retrenchment, or it may be interpreted as being of a purposive nature. The argument advanced in this thesis has endeavored to show that while the theory of dynamics is more likely to account for the correlation of experience and the objective world than is the behavioristic hypothesis, yet it is not a complete account of life. While its principles adequately explain the primitive manner in which the world is made intelligible, it offers no explanation of the nature of life nor does it examine its highest manifestations. Gestalt is solely concerned with a description of the physical distribution of the life forces and does not seek their origin or their end.

It has been assumed that life is the manifestation of Hormic Force working through the medium of matter, and if this be true, the products of evolutionary development

are so varied and so complex as to warrant the further hypothesis that the underlying "Urge to Live" is powerful and possesses the capability of working progressively upward. Matter has been subordinated and has become the garment for the ever developing and ever more efficient organisms which have marked the successive stages of spiritual advance. Man marks the upper limit of the progression and his ability to anticipate the future, and thus control his own destiny, is the final achievement which was forecast in the first successful act of autonomy and adaptation. In humanity the indistinct stirrings of amoeba become articulate and the activity of mind terminates the upper end of the series. If the hypothesis which has been here advanced be adequate as an interpretation of life, it would follow, that the motivating forces must be powerful, and greater than matter. The order which has been ascribed to their operation implies the original orderliness of the cause. If a mechanistic interpretation be not accepted, then growth is not dependent on relationships governed by chance but the nature of "horme" must be such as to allow of high attainment in the realm of advance from simple elements to complex integrations. To the observer it is at once apparent that the acts of organic forms can only be interpreted by him, on the assumption that their acts are purposively self-directed. As well, there is the spontaneity of behavior and the whole life process which are inexplicable without assuming that the activities move toward a definite goal. Both the activities of the individual and the total process viewed historically, could be made

intelligible if it were assumed that every act and every moment of life is ordered in such a fashion as to imply a notion of the end on the part of the individual. Such an assumption should not be made because it is far from evident. To imply an element of goal-seeking in the acts of the humblest organism, to assert that mammalian forms are largely guided by immediate ends and even to admit that man in great part, exercises self-direction and true will, do not tax the credence of present-day belief. To say that no signs of purposive action are evidenced and that the cosmos is a machine without a creator is an untenable position. On the other hand, the implication, that the embryonic element of purpose as reflected by the observance of the kaleidoscope of life, is but a part of a larger and conscious purposiveness, is a hypothesis for the metaphysician.

Part. "3" CONCLUSION

The analysis of the learning process by the behaviorist is not entirely satisfactory and the theory has not been applied in a way that would exclude all irrelevant factors. There has, therefore, been no opportunity of knowing how a thorough-going application of such a principle would operate. The results that have been forthcoming are not very promising and would appear to indicate the necessity for a modification of present methods. The results of that kind of teaching which merely aims at improvement of the existing "topography" and makes all learning a process of tracing out the useful connections in the neural system, have not been successful. The curve of learning which results from teaching that is guided by such a principle, is merely that which is obtained from a graphic representation of the "Law of Probability", and we must conclude that either this is a true indication of the way in which learning takes place or it may be due to the fact that such a method of tuition has very little influence in the acquirement of knowledge. A broader inquiry substantiates the latter alternative. A child in the relatively brief period of infancy obtains a complete mastery of the colloquial tongue. The student of a modern language spends thrice the time and effort, and the results are far from being perfect. Where a truer method will improve existing conditions the failure to apply it becomes a vice. Since it is generally conceded that a state of perfection in teaching methods does not obtain, it would seem the course of wisdom to admit that the pupil is, to say the least, a resourceful agent, and that



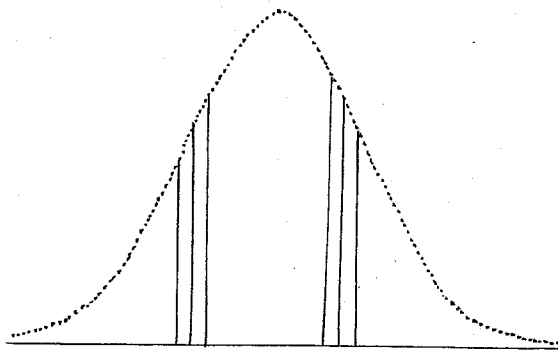


Fig. 19.

Normal Frequency Curve.

Abscissa--number of successful responses.  
Ordinate--number of pupils.

(Adapted from Pyle.)

his capabilities are such as to allow of a much speedier advancement than that which he ordinarily makes in the schools of today. It is not suggested that present-day methods entirely lack value, but rather that a wider conception of the various relations involved would effect a substantial improvement and that a change in the place where emphasis is brought to bear would justify many of the pedagogic practices that are presently in vogue and which fail to secure the results which their careful application would predicate.

#### OLD CONCEPT AND MASS PRODUCTION.

The old belief, that an infant is a groping, aimless creature, which stumbles on a mode of behavior, does not sufficiently account for the attainments that are made. Applied in the class-room and bolstered by the results of hastily administered external "Tests" the same concept has produced a system of "Lock-step" advancement. This has been the natural consequence of the assumption that an orderly presentation of the facts of knowledge and a suitable arrangement of all the circumstances surrounding the acquisition of new facts are all that is required to ensure the uniform progress of every pupil. The counterpart of this method is reflected in the once prevailing conception of learning as something contained in books, to which reference may be made when occasion demands. While education is no longer looked upon as a process of packing things in a trunk it is nevertheless true, that the methods which are often used, tacitly assume that this is so. The trunk is slightly more commodious though not as stably built as before, and efficient ways

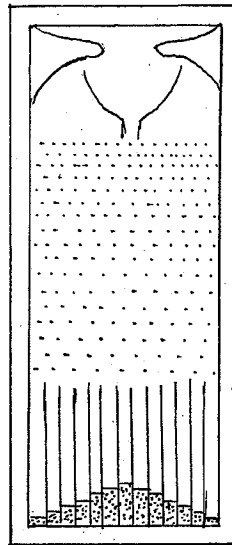


Fig. 20.

Mechanical representation of "Normal" Distribution.  
Shot placed in the funnel at the top finds its way  
downward over small pins to the piles at the bottom.

(From F.Galton. Natural Inheritance.)

(Adapted from Bentley.)

have been devised of packing more articles therein. A little more pressure is exerted here, and a little less there than the crude methods of a previous day would dictate. Where resistance is encountered, a test will measure the need and suitable drill will complete the task. The ancients aimed to impart wisdom and this was not synonymous with the present-day endeavor to "transfer" knowledge. The process of dealing with "inert ideas" leads to what Whitehead terms "dry-rot." It does not succeed in inter-relating the various truths which are present, and a deeper appreciation is needed of the fact that these connections can reveal themselves only to an organized agent and that they do thus reveal themselves is a consequence of the nature of the observer. If, in an analysis of the learning process this elementary truth be kept clearly in mind, the existence of cause and effect independent of perception will be correctly estimated as a fact of secondary importance. Such a narrow understanding of the nature of the pupil and the task to be accomplished, results in an impasse, and staleness rules where joy should be supreme. The crowded class-room precludes the necessary attention to each individual, and the "mass" production which prevails in well-ordered city systems further aggravates the unhappy state of affairs. The pupil is approached from one angle at a time and seldom is there a focusing of his total resources in the conquest of a situation, which should under normal circumstances test his total capacity and bring him the joy which only accompanies creative achievement.

A NEW CONCEPT AND CHANGED AIM.

It has long been recognized that a shift of emphasis must take place, and up-to-date pedagogic treatises make suitable reference to the pupil as the prime consideration in the educational system. Opinion has wavered between two extremes and at one time a rigid discipline prevails and there is a meticulous prearrangement of the numberless details involved in the administration of a proper "dose" of the material to be learned. On the other hand, the free development of the pupils' powers has become a popular "fad" at various times and no reason has been advanced in its support other than the general "feeling" that it would be a good thing to foster- even if it be somewhat novel. The time would seem opportune for a restatement of the aim which the schools should foster, and for a review of the factors which are within the domain of the educator. Nowhere is there such variance as in the delineation of the aims which education is supposed to further. A close examination of the facts of the situation will reveal the origin of such a diversity of opinion. The observed effects of organized instruction are more or less approved, and these effects with their multiplicity of applications henceforth become incorporated as aims to be cultivated. It having been observed, that "schooling" produces a good citizen, the cultivation of citizenship forthwith is an aim of the schools. A liberal education is seen to produce the tolerant man, and straightway the direct inculcation of the virtues of toleration find their way into the curriculum. A deeper understanding would

appreciate that life in its uniqueness belongs in a different category from the subject-matter of any other branch of investigation. Irrespective of the effects of tuition, certain principles can be laid down which will revolutionize the present-day procedure in the class-room. The elementary fact, is that the pupil is a live and resourceful agent who is endowed by heredity with the accumulated wealth of ages of evolution. He is not devoid of capability and from birth on exhibits an autonomy and resourcefulness which are hard to explain by a theory of "mechanics". He is capable of self-development and as organization proceeds his powers become articulate. The business of the school is to aid the child in his natural tendency to progress. His capacity to adapt his world of inner experience to the orderliness of the objective surroundings, is inherent to all life, his endowment of instinctive tendencies aids him in the mastery of his surroundings, but his outstanding mental ability indicates the way of future progress. It is in the furtherance of mental development that present-day education is concerned, and since development depends on the increasing organization of previously unconnected factors a conscious appreciation of the way in which incorporation takes place would enable the teacher to render more than a casual or incidental aid. The intelligent child of adolescence will not stray from the paths of virtue nor will the highly educated adult need the ready-formed opinions of a mentor to guide his thought and conduct. If the avenues of development be kept open and a wise guidance along general lines be exercised, the contents

of the set curriculum will become of minor importance and the lasting effects of education will be correspondingly greater.

### THE IDEAL

As organization proceeds, the individual establishes his self-identity. The means by which this is accomplished are various and of secondary importance. The single fact that is presented, the particular text that is used, and the total slant of the course of study, even the response of the pupil- are all relatively unimportant except as they indicate the establishment of a relationship in a larger context. Certainly it seems to be a misplacing of emphasis to disregard the total effect on the pupil and the consequent significance which his development will bear to a wider social purpose. More attention ought to be given to the flow of the forces which sustain his activity, and their guidance along lines which are in keeping with his "natural" mode of attainment. This is essentially a process of creation, and as each act is entirely new and unpredictable, the role of the teacher is limited to a general guidance which will facilitate the initiation of the new mode of behavior. Sufficient attention has not been given in the past, to the creative nature of all activity on which true progress is based. Too often tuition is made a process of memory secured by a dead repetition. The real nature of the child asserts itself on occasion and breaking the bonds of precedent, reaches forth in an unlooked for way. An atmosphere of freedom is necessary for the play of the creative forces and the development of "personality" which is the acme of all educational endeavor. Freed from the

bias of artificial regulation, his energies conserved by careful guidance and his creative efforts commended, the developing child may proceed with increasing speed toward the goal which by present methods he attains in a more or less painful manner- if at all. The casualties and waste in the schools of today are enormous and a different tale would be told did a wiser guidance allow each to develop to the full, the capabilities of which he is the possessor. The teacher, text and curriculum are necessary adjuncts, but should never be the agents for stifling of the possibilities which more freedom and opportunity would make apparent.

INSTRUCTION SHOULD BE POSITIVE.

A preliminary order is imparted to the individual's experience by the "sensory organization" which operates from birth onward. Interaction with his surroundings rapidly modifies the naive presentation of the earlier stage and the child of school age has gained a momentum which meddling teaching fails to stem. A variety of disconnected topics and modes of tuition each bring their little quota of effect, but any effort to stem, or change the characteristic forward march of assimilation is fruitless. It is well that this is so, for otherwise the differences in the product of the class-room would reflect the pet attitude of each mentor under whom the pupil has learned. But we should no longer console ourselves with the fact that a lasting injury can hardly be inflicted by the most stupid teaching. The time has come when the efficiency of applied instruction should replace the unenlightened methods of a former day. "Directed teaching"



must become a positive factor and no longer be content with giving an occasional push to the cart of progress. It must exert a continuous guiding influence, confident of the validity of its methods. The absence of any outstanding disastrous results in the past must not bring about a false sense of security. In the broader field of Social relations the world of today is witnessing an enormous upheaval, old ties are broken down and a machine out of control careens onward with none wise enough to halt its mad rush. In a smaller way the innate efficiency of individual organization prevents catastrophe, yet this does not furnish an apology for the inefficiency of instruction.

PRINCIPLE AND DETAIL IN LEARNING.

The methods of present day pedagogic practice may be likened to the builder, who proceeds to erect a house by placing brick on brick- each being truly laid- yet if he has no preconception of the nature of the completed structure, the dwelling will reflect the make-shift fashion of its erection. A constant linking of detail to the total context is necessary, if the meaning which accompanies true progress is to emerge. The great majority of adolescent students when confronted with the algebraic expression  $\sqrt{x} = 16$  will forthwith give "4" as the solution. Such an interpretation is primarily due to the methods by which the pupils have been trained. The radical sign is noted, and such perfection in the mastery of detail exists that the perfect root "4", at once comes to mind. An intelligent prereading, which would be the consequence of an attitude directed to see the total

problem involved, would abolish such an error. There is a total perception relation to every situation and the mastery of details, though important, is subordinate to the real method by which development takes place. In the teaching of mathematics the material is bound to be concrete, but the methods should be correspondingly general. The practice of a former day placed stress on the mastery of principles and the details were clustered about the central theme. Today, a tabulation of errors and a supposedly scientific treatment, prescribe the amount of attention which shall be devoted to each point where difficulty appears. Rather than appreciating the difficulty as being really due to a failure to apply the principle involved, the remedial measures are based on a survey of all the exceptions to the rule. A relegation, to "drill", of those facts which should be mastered in a "parrot-like" fashion may be excused for purposes of convenience, and if a fixed attitude of viewing each problem in its totality is encouraged the evil effects will be minimized. The wise teacher, only, is capable of differentiating the part which "drill" shall play and that which intelligent understanding shall accomplish. Much can be achieved by encouraging the student consciously to organize his "ideas" as an aid to the real incorporation which should ensue. Nowhere is the function which incorporation should discharge more evident than in Recall. The more meaningful the material is, the greater the wealth of detail which memory can furnish; whereas the original mastery of the same material in isolation from the pattern round which it clusters will be well-nigh impossible.

Great concentration is needed in the economical mastery of "nonsense material." That which carries a modicum of meaning is more easily learned, while a body of truly intelligible facts is acquired with an ease which is in proportion to the existing field of organized relations to which it may be linked. The process of grading pupils according to age, grade, and subject is, to say the least, but a rough classification. A selection of groups of individuals who have similar quickness in the dynamic incorporation of new factors, would result in an economy of time and effort. Both present attainment and capacity for further adaptation are important aids in grading, though the latter would be a truer measure for making a happy selection. A reversion to the older method of teaching "principles," a more correct judgment of the pupil as being a capable agent and one not requiring direction at every particular move, and a grouping of students according to their ability in acquiring new "ideas", would each contribute its quota to a more sensible procedure than that which obtains.

#### MOTOR LEARNING AND DRILL.

The drive for stamping out the heresy, which affirms "mind" to be the true agent of rapid learning, has had its full effect. There is no differentiation made today between the highest attainments of mental acuity and the crudest primitive movement of physical adaptation. It is not to be denied that the accomplishment of autonomous activity was a remarkable advance. The school child is an excellent animal, as such, but he is more. The "Laws of Association" have dealt with his meaner and elementary accomplishments in a realm where his

superlative powers are not displayed. A wealth of data has resulted from these investigations and the validity of the theory is not as real as its practical utility. The narrowing of the field of inquiry to non-meaningful material, has prevented the absurdities of the most important assumption from becoming noticeable. The wholesale adoption of the "Laws" was made when investigation had unearthed enough material which gave what appeared to be a plausible working basis of certain hitherto unexplained phenomena. By many, education came to be looked upon as the formation of a sequence of useful habits. It is not too much to say, that to a great extent the entire procedure of the class-room, consisted of the inculcation of those habits which the author of a course of studies or a text had laid down. The endeavor of the teacher has been confined to the restraint of intelligent beings in an effort to make them go through an activity which is quite unnatural. Often no incentive has been given—a thing which the director of an animal experiment would never omit. This may seem like a caricature but is only too true to fact, and if the child has not continued in the state of perplexity which an animal in a "puzzle-box" displays, it is due to his recuperative powers rather than to the wisdom of the methods employed. A knowledge of the instinctive equipment of the child is an excellent beginning for a wise planning of his school-life. An understanding of the way in which certain primitive learning takes place is also essential. Even here the dogma of "drill" has exerted its withering influence. An example is afforded by the popular

mode of initiating a child into the mysteries of arithmetic. Each number from 1 to 50 or 100, is carefully analyzed and picked to pieces. The more ingenious the teacher, the more numerous become the combinations of relations which are presented. The logical analysis which the adult mind of the teacher formulates, is transferred in its entirety to the immature pupil- on the plea of "dynamic" teaching. A child tutored under such a method was heard to remark "I am thinking that three fours make eleven, I should be thinking something else, but I can't remember what the teacher said it should be." At a later time the same child could glibly give all the "facts" of number 40, but was at a loss to know if 17 was larger than 40 because that particular statement had never been learned. Had the natural and old-fashioned way of counting first 17, and then 40 similar objects, been followed, some of the real meaning of the existing relations would have been acquired. There is more work involved in counting 40 than in 17, and it is easily free to be twice as much. A transfer of the same concrete presentation to dissimilar objects would have made evident another important result and the establishment of the concept of abstract number relations would have been initiated. The dogma of "mechanics" inevitably falls short even on its own demerits. The student of adult years, refusing to taste of the well of "drill," is left largely to his own devices. The texts which deal with the subject of adult instruction are as few in number as they are devoid of positive suggestions. The exceptionally brilliant pupil obtains little or no benefit from present tutorial methods.

He is not encouraged to push his powers of organization to the limit and lacks all guidance at points where only expert influences should lead. As a result, the training which he receives is entirely unsuitable, and as the situations which present themselves to individuals of lesser capabilities than his are not problems for him at all, he departs into society lacking a method of approach to the difficulties which he is sure to encounter. The occasional venturesome soul who departs from the paths of pedagogic orthodoxy is confronted with the discrepancy between the results which the adoption of meaningful teaching is expected to give and the actual responses that are obtained. If his nature be timid, he is discouraged and falls back at once on the more satisfying methods of "drill"; but if on the other hand, there is an appreciation that large and lasting relations are built up but slowly, he will look to the progress of the pupil after leaving his hands, for the true evidence of his handicraft. The extremist who swears by drill, and the same thing camouflaged as "suitable drill" and "remedial drill" will inevitably be led to the position where the establishment of "reflex" action becomes the aim and the evolutionary expedient of an older time is introduced in uncongenial surroundings.

#### THE APPEAL TO INTELLIGENCE.

Mind is not a "dead thing" to be sharpened by the skill of the pedagogue. It is the outstanding possession of the total organism and bears evidence of its evolutionary origin. It is a factor that an intelligent educational programme cannot ignore, and the latest and most efficient type of

learning cannot take place without its aid. Neither is the most significant feature of acquisition synonymous with "habit" formation. One popular text widely used in teacher-training schools, dealing with the manner in which the subjects of mathematics are to be approached, has this to say:

"A scientific analysis of algebraical abilities has not been made, but it is probable that in algebra each type of example requires a specific ability if it is done automatically. The engendering of arithmetical abilities is based upon the laws of habit formation. These laws also apply to the teaching of the operations of algebra. Individual differences complicate the teaching of arithmetic. They have been shown to be equally conspicuous in algebra!" (I)

Individual differences are no more real here than in the elementary field wherein the "scientific" student of teaching practice has roamed at will. The more advanced subject in which mental activity is predominant only serves to make the differences more apparent. If the mastery of algebraic processes depends essentially on the formation of correct habits, what sum of learned responses will accomplish the task involved in the solution of the most simple problem? Is the accumulation of habits carried to that limit of automaticity at which the solution is derived in an instant; or does the mastery of the relations bring the moment when the interrelated threads previously converging to a focus, finally unite under the spur of mental effort? Is it not more likely that the curve of habit formation differs from the steep curve of intelligent performance, for a very real reason? The organization is not a mysterious procedure and is in great measure due to the conscious effort of the subject aided by

(I) "Educational Tests and Measurements" Monroe, DeVoss and Kelly. p.231.

the leading hand of the teacher. It is admittedly true, that all real learning depends on self-activity, and it is just as evident that the pupil effects the organization of himself through the ordering of his external relations-even though they be not tangible objects. The infant's handling of his blocks is in no-wise different from the adults mental manipulation of factors of another order. One writer has said that "Style in mental activity is 'Intellectual Morality'" (X) The present-day style is a somewhat sorry one of mere expediency. The time must come when the practice of teaching will not be limited to the "drill" which seeks to implant habitual modes of response. The day will arrive when the intelligent performance of the human agent will be acknowledged for what it is, viz: the predominant factor that makes possible the scaling of the heights of his environment.

#### THE ATTITUDE OF THE PUPIL.

The conative forces which keep the processes of life astir, follow the outlines of the patterns of instinct. At an early stage the primitive operation that follows the inherited forms of behavior becomes modified by the lessons of experience. Man accomplishes much more than the brute and is able to direct his own acts in such a way that he is not bound by the forces of circumstances. In early child life the acts of behavior are largely guided by impulse and only gradually is the transference to purposive and controlled endeavor effected. At the higher level encountered in the

(X) Note.A.N.Whitehead.



upper grades in school, the automatic attention which the elementary teacher seeks to hold, is more difficult to secure. A lesson presented with the aid of lantern slides may be "interesting" to the point of absorption of the child's attention, and is usually considered a highly successful procedure. A teacher who would confront his class by first explaining that some serious concentration would be needed, that the task being worth while- though uninteresting- must be mastered, would forthwith be condemned as a crude representative of his craft. Is it not true that "hard thinking" is unnatural and largely painful? It will not suffice forever to expect of a pupil only that amount of effort which the puppy-dog exerts when he watches an interesting canine feud. A proper approach which would initiate the child into the technique of guiding his own attitude, need not necessarily estrange him from his tutor. They are not two opposing forces but are rather allied in the conquest of a worthwhile task. The pupil who has been trained to disregard the trivial matters of momentary interest, will endeavor to grasp the "idea" or principle of the presentation, and if he finds his attention wavering will exert the volition of which he is capable and assert the positive power which he possesses. At a lower level, the attitude in which an unknown object is approached, has a tremendous influence in the subsequent interpretation of its features, and to the young child walking at night every fence post is a potential ghost. Learning on a higher plane implies a self-instruction "to inquire" and it is only when the pupil asserts his own

initiative, that speedy conquest follows. Present day classroom methods ignore such a stand as being old-fashioned and non-scientific. The child is a bit of raw material which the skilful practitioner can mould at his will. Such is not the case, and the socially inherited habit of "conscious concentration" must be utilized and directed by the teacher to serve the ends of advancement. The joy of mastery will far exceed the temporary interest, which a lesson mainly employed in creating an atmosphere of novelty, can arouse. A study of the psychological basis of present day methods gives a clear indication as to why "active attitude" has been subordinated to "passive interest!"

#### DISCIPLINE AND INTEREST.

The foregoing mention of the place which a drive for "conscious endeavor" holds, may have appeared to belittle the function of "interest" as a real element in learning. It would be more accurate to say that primitive interest is an essential factor at a certain stage, but that it is superseded by a more lasting appeal when there is an appreciation of larger ends. An attempt to secure "precision" at too early a stage depresses the spontaneous attention which every novel situation evokes from the beginner. A time arrives when accuracy must be secured even if dullness ensues, and the teacher "guided by mechanics" has no substitute to offer. As a matter of fact the methods of "drill" are employed from the outset of school life and no excuse is made for its deadening effects, other than that it is necessary. A wiser procedure would take account of the dynamic nature of growth. A

period of initial freedom in the presence of knowledge and ample time for incorporation would be allotted. Then would follow the insistence that the patterns be rounded out by further significant applications. The problem of discipline arises when the unnatural methods of formal "drill are applied" The true guidance is that dictated by the situation encountered. As a consequence of the rigid enforcement of methods aiming to secure accuracy, no time is allowed for incorporation and the path of progress is cluttered with the meaningless associations that have no living or dynamic relevancy. The cultivation of a wide and enduring interest which would necessarily parallel the congruence of teaching methods with the true manner of development, inevitably solves the problem of formal discipline. The child engrossed in his task, has little patience with meddling regulation which he feels to be a hindrance, but is quick to appreciate an aid which he knows comes from the hand of one who understands his difficulties.

#### THE PLACE OF THE TEACHER.

Thorndike and the school of Dr. Watson minimize the value of teaching. The former, at the conclusion of a series of animal experiments confirmed a prevailing belief that animal behavior is essentially stupid, and that putting an animal "through an act" does not hasten the speed with which the performance is mastered. Such a procedure is not teaching, but if it be concluded that animals do not profit by tuition, the only valid inference that can be made is that animals do not learn as efficiently or speedily as man. Real teaching

aids the processes of organization. The arrangement of the external situation, the appeal to motives and the tuition which assists the pupil in controlling his own attitude, are all important ways in which the teacher may give very real help. Efficient instruction does not put the child through the act to be learned nor does it do the task for him, but rather, it consists of "giving a lead" and answering the enquiries which ensue when the pupil actively participates in a dynamic situation. The best instruction is not concerned primarily with setting a stage in lavish fashion or in displaying a wealth of already organized relations, but will see to it that whatever material is presented has vital connection with the few existing ideas of the child. All the significant combinations will be interrelated and built into the growing context of acquisition. It may be true that in the type of teaching which relies mainly on "drill", the importance of the instructor is not great; but if the powers of the child are duly appreciated it can be easily understood that the teacher is an important co-dynamic factor in a dynamic situation. By reason of his own superior attainments he may, out of his wisdom lead the child up and on to the accomplishments which only wise instruction makes possible.

#### THE TEXT AND EXTERNALLY SET EXAMINATION.

The examination system that is at present in vogue, may be useful to the author of the tests, but it is grossly unfair to the pupil. It takes little account of the nature of the "Learning Process" and is primarily concerned with statistical results. There is probably a sufficient justification for the

informal test which is arranged by one in thorough contact with those who are examined. The examination that is set by an external authority is in quite a different classification. It depends for its validity on its strangeness and isolation from the numberless factors which contribute to the results. It becomes an absolute standard of judgment rather than the measurement of progress relative to previous attainments and ability. A more serious defect is the propensity of the examiner to get off the beaten track of "principle", with the result that the examination consists of a series of exceptions to the rule, a "catch question" type of query- in short a compound of the non-essential variations of the regular subject matter. If the examination system survives, a future day will mark a reversion to the older method, whereby some scope was allowed for the pupil to develop and display his own personality. The fact that a superficial research shows a certain error to have occurred with great frequency, does not justify an undue estimation of its importance, -but it would appear more reasonable to suggest that the particular point in question was somewhat lacking in significance for the total context. Recent "scientific" research in the field of education has come to the defence of this "new type" of examination as it has guided the formation of the "scientific" text. The aim of the psychologically correct text book is to prepare a "primrose" path for the pupil's footsteps. If an error in a certain type of procedure occurs thrice as many times as another, it is given three times the attention and follows the outline of drill

that is given for a mistake that occurs but twice as often. Such is a rough description of the manner of construction. This method is due to the faulty analysis previously mentioned, viz: that the path of progress consists of an evenly graded series of steps. This is the perspective when progress is viewed in retrospect and does not conform to the real way in which knowledge is acquired. A slight rearrangement of the subject matter of such a text book would secure a totally different distribution of errors, and in general they will be found to vary in direct ratio to the complexity or difficulty of dynamic incorporation. A perfect text book will never be written because the factors of dynamic growth may not be preordered; nor is it likely that a diagnostic test will ever be devised which will discover the true and original cause of errors. In most instances the native common sense of the teacher saves the day for the investigator. Even though the text abound in "wonderful detail" and "clever device" there will be a continuance of the sound practice of first teaching the underlying principles involved and only drawing on the mass of detail for orientation, as occasion demands.

#### SUGGESTIONS FOR FUTURE STUDY.

The foregoing discussion will only be fully intelligible to those who have passed through the teacher-training schools of this country and by actual teaching in the class-room, have had the opportunity of observing the influence which current Behavioristic dogma exerts. While the claims of this school of thought are not as openly adopted as it has been implied, still the subtlety with which the theory has

penetrated the halls of practice is more dangerous than an open attack could be. The advent of "Gestalt Theory" has given an opportunity for reasserting some of the beliefs which an earlier generation applied with a fair measure of success - yet could not maintain for the lack of an adequate psychological basis. Our English brothers are accused of being somewhat behind the North American continent in Educational Research. The ultimate results provide the basis for a more accurate appraisal. England today, with its nationally minded people and closed penal institutions is in marked contrast to American conditions. Doubtless, both the new world as well as the old will contribute its quota to advancement, yet a plea for restraint is in order, that many common-sense judgments which have proved adequate in application be not discarded in favor of a not wholly proven theory. Confidence in the present economic system of the world is waning, and none may be so venturesome as to say that the solution of present-day difficulties may not eventually be found in the class-rooms of the nation. Training for cooperative thought and action can be best initiated there, and a beginning made in the cultivation of that intellectual fellowship which alone will suffice to break down prejudice and bigotry. A practical investigation of the efficacy of "dynamic" teaching will be available at a not distant time. The experiment of "Progressive Education" now being tried out in Switzerland is a movement in this direction. Even as the old economic dictum "that the field of opportunity is definitely limited," now gives way to the wider conception "that there is sufficiency for all if affairs be rightly ordered," so in like

manner the narrow professionalism and the social inequalities of the 20th century will fade before the onset of the doctrine, that improvement but awaits a better conception of what organization may accomplish, and that the limits of progress are only marked by the boundless number of possible combinations of diverse factors. The psychology of "wholeness" is indeed worthy of consideration.