

PSYCHOLOGICAL LITERATURE.

THE SIGNIFICANCE OF MIND IN EVOLUTION.¹

1. *Is Evolution Progressive?*—Most psychologists to-day believe in the evolution of mind, but the character of that evolution in detail and the stages through which consciousness has passed in the building up of mental structure are subjects which are still under debate. Hence, any attempt such as this of Mr. Hobhouse to add to the slowly-accumulating mass of reliable facts concerning animal consciousness and to interpret those facts in the light of the evolutionary hypothesis is worthy of careful study by the comparative psychologist.

The question concerning evolution, Is evolution continuous? which has agitated reflective thought for twenty-five years, has gradually been giving place to the question, Is evolution progressive? It is beginning to be recognized that, just as the continuity of evolution is not a dead mechanical uniformity but a vital reconstruction with what on the surface appear as gaps and leaps and zigzags, so that same evolution is not an unbroken upward course but a spiral movement of organization of structure and function in which the process ever and anon returns upon itself in an apparently retrogressive movement. A purely progressive evolution is a philosophic myth. All anagenesis must be read in the light of catagenesis. There is nothing in a mechanical conception of evolution to ensure that it shall be progressive.

What is the source of the ideas of progress connected with the conception of evolution? Do they arise from the inevitable tendency to read evolution backwards, to interpret the process in terms of the results, just as the mechanical and materialistic conception of evolution arose from interpreting the same process in terms of its inchoate beginnings? Is either interpretation a justifiable one taken by itself? The materialistic or mechanical evolutionist has been silenced. How about the idealistic or teleological evolutionist?

We cling with the greatest tenacity to the idea of progress. What could evolution mean for us, we ask, if it were not progressive! Yet consider the facts. "If the struggle for existence has produced the wisdom of man, it has also sharpened the tiger's claw and poisoned

¹ A critical review of 'Mind in Evolution,' by L. T. Hobhouse. London, Macmillan & Co., 1901. Pp. 406.

the cobra's fang" (p. 1). "In some parts of Africa the horse is driven out by the Tsetse fly; in others the white man succumbs before the malaria germ, just as in this country the honest investor goes down before the swindling company promoter" (p. 2). "The tendency of evolution as a whole is not to produce the highest type, but rather to produce as many types as possible" (p. 4). Can we believe in progression in the light of such facts? If so, in what sense are we using the word 'progress' and what factors in the evolutionary process are its guarantee?

2. *The Place of Reason in Evolution.*—This is the problem with which the first chapter opens. This chapter is entitled 'Mind as a Factor in Evolution.' The rest of the volume may be regarded as an elaborate attempt, in answer to the implied question, to show the significance of mind in evolution, and the dominant note in the answer is that the grounds for our belief in progressive evolution are to be found in the peculiar place which reason occupies as the consummation of the whole, becoming itself the guide in self-conscious development.

The generic function of mind in organic life and evolution is "the adjustment of action to the ends of the individual or of the species, based upon a correlation of past experience, present circumstances, and future possibilities" (p. 10). The vital essence of mind is the "bringing things together so that they have a bearing upon one another. Where there is mind there is order and system, correlation and proportion, a harmonizing of forces, and an interconnection of parts. The organism which is gifted with intelligence shows it by arranging its action on a certain plan. It adapts means to ends" (p. 6). Organized action is intelligent action. Unorganized action is unintelligent. Where there is no mind at work action is random, blind, isolated, conflicting. What is done is done on the impulse of the moment and not as a means to an end. Where minds differ is in organizing power—in scope or comprehensiveness of plan, and in method of construction or execution of the plan.

"The whole process of orthogenic evolution consists in the gradual replacement of instinct by reason, and it is the final goal of reason to do precisely what is ascribed to instinct—to bring all the experience of the race to bear in organizing the whole life of the race" (but in the case of reason to do this consciously, instead of unconsciously as in the case of instinct, p. 9).

3. *General Scope of the Work.*—Before speaking of certain special topics more in detail it will be well to take a bird's-eye view of the

whole book. 'Organic Adaptability,' 'Reflex Action,' and 'Instinct' are examined in turn (Chapters II.-IV.), with the result of finding a gradual increase in complexity and variability in the method of solution of the various problems of organic adjustment. As we pass upward in the animal scale we find that pure instinct gradually gives place to a modified and generalized form which, perhaps, is best called impulse. Out of this transformed instinct, by a process of 'Assimilation and Readjustment' (Chapter V.), is developed a stage of intelligence which is the first remove from instinct. This Mr. Hobhouse calls 'Concrete Experience.' It yields what he calls the 'Practical Judgment' (Chapter VI.). From his own experimental results (cats, dogs, monkeys, an elephant, and an otter) and from his study of the experiments of other investigators, the author is led (Chapters VII.-IX.) to the conclusion that animals share with man in the possession of 'Concrete Experience and the Practical Judgment.' The principal reason for the human ascendancy is found (Chapters X.-XIV.) to lie in the possession of language and social organization, which serve to facilitate the development of 'Articulate Ideas' (Chapter X.) and thus to make possible those 'Products of Conceptual Thought' (Chapter XIII.) which are peculiar to man. Finally, in three instructive chapters (XV.-XVII.) the main steps in the evolution of intelligence are schematized (Chapter XV. on 'The Stages of Correlation') and the place of 'Self-conscious Development' (Chapter XVII.) is shown in relation to natural selection. A few of the more important points will now be discussed in more detail.

4. *What is an Organism?*—According to Mr. Hobhouse, "By an organic whole is understood one which (1) has a certain general character or individuality, while (2) it consists of distinguishable parts each with a certain character of its own, but (3) such that they cannot exist unmodified apart from the whole, while the character of the whole is similarly dependent upon them. * * * It may indeed be doubted whether a purely mechanical whole exists in *rerum natura*" (p. 374). The function of the organism 'may be to evolve carbonic acid, or it may be to produce poetry' (p. 12).

An organism is only a complicated machine. "Put a penny on a balance, and it weighs down the scale by the simple action of the lever. Put it into the slot of an automatic machine, and it produces a stick of chocolate by I know not what complication of levers and cogs. Complexity of adjustment does not take us out of the region of machinery" (p. 31).

In spite of such statements, the author still seems to feel that

there is some degradation in the idea of the organism being even a complicated machine, and goes on to show what he conceives to be the difference between an organism and a machine. The chief difference he finds in the power of recuperation and self-reproduction of the organism. This he seems to regard as constituting a qualitative difference between the two.

In reply to this we would raise the question as to whether the difference between the organism and the machine in respect to this matter of self-reproduction is not simply a difference in degree. It is clear that "the continued motion of the pendulum depends upon an outside force. It has no power of accumulating afresh the energy which it loses at each swing" (p. 19). But the organism is self-maintaining only within certain limits, *e. g.*, between birth and death. It is true that, "within tolerably wide limits, it can survive accidents which cause a considerable departure from its normal course, and either struggle back to the typical life of the species again, or effect some compromise with circumstances by which life is maintained in some more or less modified form" (p. 19). But it is only a prolonged life and a relative equilibrium, since both yield ultimately (in old age and death) to 'outside' forces. No organism, unless it be, perchance, the totality of the universe itself, is really a self-maintaining and self-sustaining whole. Mr. Hobhouse's own illustrations of the compensating pendulum and the linotype might be used to prove just the opposite thesis.

The same general remarks apply to the other characteristic of the organism which is taken as differentiating it from the machine—its circular or spiral process of waste and repair. Illustrations in the organism are respiration, the vasomotor mechanism for maintaining an even bodily temperature, and the circuit of hunger, eating, strength, exercise, hunger, etc. But "a machine can be made to regulate its own action within certain limits. Thus, in the steam-engine, the forward thrust of the piston opens and shuts valves by which the backward thrust is at once brought about. Here there is perhaps a parallel to the automatic rhythm of breathing or of the heart's beat. * * * By the device of the 'governor' a steam-engine can regulate its own available energy in accordance with the work required of it. There is a close analogy here to the labored breathing of hard exercise where more oxygen is required" (p. 15).

Nothing could be better than the author's statement as to the nature of the growth process which, it seems to the present writer, is much more in harmony with the criticism just made than with the

point of view defended in the text. There is "a certain equilibrium point, as we may call it, which the organism is always striving to maintain." "The equilibrium is a moving equilibrium." "The process of rapid growth in youth, the slow change during maturity, and the gradual decay ending in death * * * is the normal orbit of every organism. The equilibrium point moves along this orbit, and the momentary changes of growth are so many oscillations about the equilibrium point as it moves." "Every deviation from the equilibrium point," within certain limits, "sets up a tendency to return to it" (p. 13).

5. *Instinct and Impulse*.—Mr. Hobhouse says (p. 25) that he follows Preyer and Verworn in defining impulsive actions as actions which "are caused without previous peripheral excitement exclusively by the nutritive and other organic processes that go on in the motor centers of the lowest rank." "An impulsive movement is due to purely internal changes." Evidently he does not identify impulse with what he elsewhere calls 'internal disposition' (Stimmung, craving, p. 57; cf. 69, 70, 95), yet this is just what such writers as Marshall, Baldwin and Dewey seem to mean by impulse. According to Mr. Marshall an impulse results from the inhibition of an instinct. Professor Baldwin calls an impulse a 'snubbed instinct.' Professor Dewey calls an impulse an 'unravelling instinct.' The suggestion is that impulse represents the disintegration of instinct and carries with it a certain amount of consciousness. On this view, this 'internal disposition' of Mr. Hobhouse would be brought out only when the instinct is thwarted or interfered with in some way. Certainly, in all that he says on the subject of ethical impulse (pp. 314, 337, 354-355) and in much of what he says under the head of the method of 'perceptual learning' (Chapter VIII.) he leans toward this view of impulse.

This, however, is simply a matter of terminology apart from certain other considerations which are involved. The suggestion here made is that much light would be thrown on these other issues by a recognition of the true relation of impulse to instinct. This brings up the whole question of the emergence of consciousness within the life of purely instinctive action.

6. *Impulse and Consciousness*.—The most important of these other questions which are here involved is connected with the relation of instinct and impulse to consciousness. Mr. Hobhouse says distinctly that he will not raise this question (pp. 79-80) and then goes on to say that 'hereditary structure' supplies sensations to consciousness,

that 'hereditary responses' yield 'sensation and feeling' to man and therefore probably to animals as well. But the problem is, under just what conditions do 'hereditary structure' and 'hereditary responses' yield consciousness? Here is just where a true psychology of impulse fills a gap in the evolution of mind. As has just been said, Mr. Hobhouse does not elaborate this point, but his statement as far as it goes is almost identical with that of Mr. Morgan on the same point. It will be profitable to refer to the statement of the latter in this connection. The criticism offered upon his view will apply to the less explicit doctrine of Mr. Hobhouse.

Mr. Morgan ('Habit and Instinct,' p. 136; cf. summary, pp. 323 f.) says that "on the occasion of the first performance of an instinctive activity the coördination involved is automatic, and cannot be regarded as under the guidance of consciousness; but that the carrying out of the activity furnishes data to consciousness in the light of which the subsequent performance of a like activity may be perfected, or modified or checked." "From this it follows," he says, "that only on the occasion of its first performance does such a congenital activity present itself for our study in its instinctive purity. For on subsequent occasions it is more or less modified by the results of the experience acquired by the individual."¹

Now the question is, How and why does an activity which is relatively so perfect as a congenital instinct 'furnish data to consciousness'? If the reaction takes place in the first instance without consciousness, why should consciousness be developed in connection with it later? What Mr. Morgan's theory lacks is a sufficient explanation for the emergence of consciousness at this point, or for the fact that the 'carrying out of the activity' at this point or at any other point 'furnishes data to consciousness.' But on the theory which is defended by the present writer,² the emergence of consciousness is connected with some break in the adjustment process by which the animal is endeavoring to adapt itself in its environment. The definite congenital instinct will continue 'in its instinctive purity' as long as the process of adaptation runs smoothly. But if there is any serious friction in that process of adaptation, some new reaction is demanded, or some modification of the old one, and it is at the point of and for the sake of this new need of the organism that consciousness appears as the medium in which the new mode of response is built up.

¹ Cf. also his statement in 'Animal Behaviour' (1900), p. 332, that 'organic evolution provides ready-grouped data to consciousness.'

² Cf. *Journal of Comparative Neurology*, Vol. XI., No. 2, for a fuller statement.

Mr. Marshall speaks of 'instinct-feelings' as the subjective accompaniments or conscious coincidents of 'instinct-actions' ('Instinct and Reason,' p. 86), and shows how this 'consciousness coincident with the instinct-actions' arises. He shows that impulses "are mental phases which in an objective view we always find to be determined by the inhibition of instinct-actions as these are more or less modified by experience; which instinct actions have been stimulated by the presence of conditions that might normally call them out, but which for one reason or another are not at once realized" (p. 94; cf. Chapter XIII.). He says (p. 342) that every instinct "implies the possibility of the appearance of an impulse, provided the conditions of stimulation appropriate to the expression of the instinct are realized, yet under certain forms which restrict this expression." He denies Professor James' contention that 'every instinct is an impulse.' "When we see a man aim a quick blow at an enemy suddenly appearing before him we say that the actions involved express the instinct or capacity within him; but it is when we see him restrain this action under temptation that we properly say that he must have had an impulse which would have led him to strike his enemy had it not been restrained in one way or another" (p. 342). "We act instinctively in a thousand different ways during all our life without paying any attention to the acts; but some day, when something inhibits our instinct actions, then we have a disturbance of our mental life, which in complex cases produces what we designate an impulse" (p. 343). "In no case does the impulse appear in consciousness except as the result of an obstruction to the realization of certain activities which are determined by the existence within us of coördinated neural structures" (p. 344). The activities, if they find expression, which accompany such a state of consciousness are random, uncontrolled, haphazard, unmediated. Impulse is characteristically accompanied by an emotional consciousness, by what Mr. Marshall calls 'instinct-feelings.'

This, as I understand it, is the essence of the view of impulse as held by Professor Dewey and Professor Baldwin. The original fact of all experience is its character as a movement or tendency to action. Interrupted or obstructed activity gives rise to feeling. Out of feeling sensation or cognition is gradually evolved. Impulse represents the transition, the emergence of the conscious out of or, better, within the unconscious. Mr. Marshall supplies what is lacking in Mr. Morgan and Mr. Hobhouse. The bearing of this on the theory of the criterion for the presence of consciousness (Hobhouse, p. 82) and of the distribution of intelligence in the animal world (pp. 103-111) is

obvious. Curiously, there is no mention of Professor Loeb's researches.

7. *Instinct and Reason*.—Intelligence Mr. Hobhouse defines as 'the power of an organism to adapt action to requirement without the guidance of a hereditary method of adjustment' (p. 82). In the growth of this power of correlation of its own past experiences with its subsequent action lies the evolution of animal mind. But instinct and intelligence or reason, though opposed in idea, are so far from being incompatible in fact, that it is actually within the sphere of instinct that intelligence first arises (cf. 270, and especially, pp. 77-79, a remarkably good passage). Here, again, by some strange oversight, there is no mention of Mr. Marshall's almost identical view in his '*Instinct and Reason*.'

First, it is pointed out in what respects the scope of animal consciousness is restricted (pp. 312, 314, 315, 320, 321). Second, it is shown how in detail reason develops within instinct (pp. 58-79). "The impulse to reason is itself an instinct" (p. 318). Third, instinct furnishes the main outlines of experience, even in the case of man who possesses reason. "Instinct lays the ground plan of conduct, within which, details may be remodelled by individual experience" (p. 320). Instinct is finally transformed and evaluated by reason while still furnishing the content of experience (pp. 357, 370-372). Fourth, the elementary form of reason consists in connecting hereditary modes of reaction (instincts) with definite objects or situations—"a form of the defining or particularizing of instinct" (pp. 107, 108). Fifth, it may roughly be said that instinct (when broken up in impulse¹) presents the ends of experience, and reason works out the means. "The first function of intelligence is to define the proximate ends of instinct, and thereby to render experience available in the choice or revision of means" (p. 270). Finally, the chief difference between man and the lower animals is that in the lower types of consciousness the attention is concentrated on the response rather than on the stimulus in the organic circuit (cf. pp. 142, 143). The civilization of man is simply the concentration of attention on the stimulus, on a large and elaborate scale. The response is the first phase of the organic circuit to come to consciousness because it is most directly connected with action. This might have some bearing on the difference between the so-called 'sensory' and 'motor' types of subjects in reaction experiments.

8. *Perception and Conception*.—The use of the term 'perception' by the author is open to criticism. It is difficult to believe that

¹ As above outlined.

there is any ambiguity in Mr. Hobhouse's mind as to the relation of perception to conception, but certainly it is not made in this book to stand out as clearly as his use of the term 'simple apprehension' in his valuable 'Theory of Knowledge.' 'Perceptual acquisition' (learning by perception of results) is distinguished from 'motor acquisition' (learning an act by doing it), on the one hand, while it is quite carefully marked off from conceptual processes, on the other. The use of the term is a common enough one, but not the best one, for perception arises only *with* conception, whereas Mr. Hobhouse, like Romanes and others, makes it precede conception.

His use of such terms as assimilation and association and practical judgment are apparently an attempt, like the term reception of Romanes, to fill the gap between perception and conception when thus conceived as successive stages of cognition instead of as complementary aspects. One sees evidence of the influence of the English empirical psychology in certain passages (cf. pp. 135, note, and 135-136, summary). Mr. Hobhouse says that 'assimilation does not necessarily involve ideas at all' (pp. 113, 114). How he is to reconcile this with his other statement on the previous page (p. 112) that all experience 'is in a sense experience of a relation,' is not made clear.

According to Mr. Hobhouse, where there is analysis of the relations implicit in a perception we get conception. But the knowledge of the situation as a whole without the relations being dissected out as distinct elements is perception (p. 117; cf. p. 124 and summary, pp. 135, 136). It certainly is an unfortunate use of the term 'perception,' because of the ambiguity. What we need is some unambiguous term to mark off the indeterminate stage of cognition from that determinate stage in which both the objects (of perception) and the relations (of conception) are distinguished within the cognized whole.

Mr. Hobhouse quotes Professor Thorndike with approval when he says that the animal, like the man swimming, 'simply feels an impulse from the sense-impression,' and implies, at least, that the animal has the *sense-impression* of the water, the sky, the birds above, as well as the impulse. But is not just this distinction the mark of the higher type of intelligence? The animal, like the man swimming or playing tennis, does not feel the sense-impression as such at all. He feels the impulse and it is only a subsequent analysis which reveals that the sense-impression was latent in this vague kinæsthetic consciousness of impulse. Perception and conception represent not successive stages but correlate phases within the cognitive function: they appear together and they vanish together.

9. *Methods of Learning*.—One of the most helpful discussions in the book is that which attempts to answer the question, How do animals learn? According to Mr. Hobhouse, the fundamental underlying principle of learning is that a wave of excitement once started in the nervous system persists for a certain short time (p. 93). Out of this grows the possibility of 'assimilation and readjustment.' This elementary correlation is the first stage beyond instinct in the evolution of mind. Its operation is confined to adjusting reactions suitably to their immediate results. If more remote correlations are to be effected, it must be by a very slow and gradual process. This renders it possible for animals to thrive without highly definite instincts and brings about the substitution of more or less general tendencies and impulses for the more narrowly defined hereditary methods of action.

It is not necessary to dwell on the unlearned type of reactions or the instinctive method of adjustment, except to say that in this connection the author calls attention to many human adjustments which are still practically on the animal level (pp. 310, 311, 318). More important is the method of trial and error or, as Professor Thorndike calls it, the method of trial and success. Mr. Hobhouse calls this the method of assimilation. All learning by experience has in it the element of rationality. Pleasure and pain play an important part in 'stamping in' a response (pp. 85 f., 98, 99, 141, 142). One trial may be enough to teach the animal, but the effect of the experience tends to wear off with time (p. 87; cf. 84). Most interesting is the treatment of what Mr. Hobhouse calls 'the critical success' (pp. 204, 267, and *passim*). Mr. Small, in his study of the rat, has called attention to the same thing. In the function of the critical success we have the first intimation of the method of learning by ideas. The real transition from the brute to the human took place when the animal first became conscious of the fact that intelligence or ideas are a valuable factor in the struggle for life as well as mere physical prowess or brute force. It is immaterial whether this discovery was made first by a biped such as the anthropoid ape or not. Whenever it was made, it placed the animal at an immense advantage over its fellows. Henceforth rational acts are not wholly of the trial and error type but involve the beginnings at least of deliberation in its twofold aspect of reflection and anticipation. Rational acts from this point on become more or less spontaneous and free instead of the result simply of necessity and coercion. "As ideas become more articulate, the results of experience are more freely combined or modified to suit practical

needs. Something like originality begins to show itself, and we have instances of what we have called 'spontaneous application' (p. 234).

The three modes or types of reaction may be illustrated as follows. "Three persons start for a certain place. One does not know the way, but is directed to follow a certain road. Keeping to this road, he arrives safely and speedily unless there should be any unforeseen obstacle, such as a broken bridge, in which case, as he knows no other paths, he is blocked" (this is the case with the instinctive method of reaction). Another "wanders at random, but as everywhere there are hedges and walls preventing him from getting far out of the way, and as hedges grow up behind him to prevent his return, he gradually arrives by eliminating all possibilities of going anywhere else" (this is the method of trial and error). The third "knows where the point is, and finds his way there, going by a detour if the direct road is impassable" (this is the method of ideas, p. 400).

10. *The Function of the Universal in the Evolution of Intelligence.*—"We are thus brought to the primitive function that ideas fulfil in conduct. As long as impulses are fixed in relation to stimulus, whether by heredity or habit, action neither requires nor tolerates any further guide. But if the ends of an impulse are to be served by actions varying from case to case, a uniform reaction to uniform stimulus will no longer do, and the case is met in the human world by a formulation of the end to which one is impelled, along with its relation to the surrounding circumstances. The formulation of an end constitutes an idea, and the impulse so qualified becomes a desire. In other words, so long as stimulus guides action in a uniform manner, no idea of the end is required. Where the point to which action is directed must be defined specially for each action, there an idea is, in human conduct, necessary" (pp. 130, 131). This may be regarded as the particularizing function of the idea.

"The universal judgment is not so much a reference to an indefinite number of particulars as a rule of reference. * * * Its function in thought is (*a*) to sum up the result of a mass of experience, and (*b*) thereby to form a guide in dealing with a further mass of experience to come. Under both aspects it brings the action of the moment into explicit relation not merely with the immediate circumstances of the particular end, but with masses of experience past and future" (pp. 298, 299). The universal thus renders explicit 'influences which have already been operative without being expressly formulated' (*e. g.*, instincts, habits). 'When the results of experience can be rapidly

summed up and communicated' in and through the universal, action becomes more effective. This ability to build up a world of ideas or of universals by a correlation of his experiences in masses or systems is one mark of man's ascendancy over the lower animals (p. 299). This may be regarded as the universalizing or generalizing function of the idea.

In the pre-reflective stage "what corresponds to the major premiss is a certain formed disposition, what corresponds to the minor a stimulus, what corresponds to the conclusion a response" (p. 323). "The premisses in this case are antecedent conditions from which the response follows, but there is no evidence that either of them is grasped in relation to the response or its results" (p. 323). In the stage of the practical thinking of the plain man and of the higher animals "the starting-point is a perceived relation — as of action and consequence — an 'observed particular,' and the result a judgment equivalent to the combination of minor premiss and conclusion, the major being still represented only by the mental habit which predisposes toward the combination" (p. 323). "In the reflective stage the major premiss itself becomes explicit and the syllogism complete. We have a universal judgment, the particular, and their combination in the conclusion. * * * The apprehension of the universal appears as a turning round of the mind upon its previous operations; a bringing into clear consciousness of what it was doing before" (p. 323). "Thought in this stage may therefore be typified in the completed syllogism with explicit major premiss as contrasted with the truncated syllogisms of the previous stages" (p. 325). Nowhere have I seen a statement which brings into clearer relief the true relation between the *idea* of psychology and the *universal* or *concept* of logic, and the relation of both to the pre-conscious modes of action. In this connection attention should be called to the valuable discussion in Chapter VI. of 'Concrete Experience and the Practical Judgment.' The practical judgment, according to Mr. Hobhouse, is intermediate between habituation on the one side and reasoning on the other, and in it he finds the key to the behavior of the higher animals as well as to many acts of human beings which are still on the animal level. Chapter XV., which is a 'Summary on the Stages of Correlation,' ought to be read in connection with the article by Professor Dewey on the same subject in the *Philosophical Review* ('Some Stages of Logical Thought,' September, 1900).

11. *Natural Selection by Conscious Adaptation.*—We may now return to the question with which we set out, Is evolution progressive? and answer that evolution along the line of rational intelligence

is progressive, because its guarantee lies within itself. All other evolution either tends to be stationary or tends toward retrogression. "The truth is that organization as a method of maintaining the species is set from the first in antithesis to natural selection. Natural selection rests on destruction. It maintains the type only by sacrificing the majority of individuals" (p. 387). "Natural selection can preserve and augment nothing that is not immediately useful. If the pigment-fleck which is the first rudimentary germ of the eye is preserved and developed, it must be because it is useful as a pigment-fleck. The plea that it will later develop into a magnificent sense-organ of the highest possible utility could not avail it in the court of natural selection unless it could prove services actually rendered by itself" (p. 391).

But with intelligence comes a latitude and development in scope as well as refinement of organization, and this latitude is a necessary condition of the highest development. The advent of intelligence means a revolution both in the method and in the rate of progress in evolution (cf. pp. 382, 383, 401-403). "Organization, especially in the form of intelligence, sets rather to maintain the individuals, and in so doing improves the type. The rational organization of life, from the dawn of parental care upwards, tends to suspend the struggle upon which natural selection rests * * * culminating in the deliberate self-development of a race under the guidance of reason. Organized life rests not on internecine rivalry, but on mutual interdependence" (p. 388).

Natural selection means limited supply of food, overproduction of individuals, struggle to the death of these individuals for this food, and either the elimination or the involuntary mutual adjustment of the individuals. Self-conscious evolution means controlling the supply of food and the environment in general, controlling the production and education of individuals, and the conscious cooperation of the individuals in mutual adjustment. This is just as *natural* a process of evolution as so-called 'natural' selection. The anti-social unethical individual goes to the wall here just as the weakling goes to the wall in the struggle for life. But the 'struggle' here is to make the unethical individual ethical, to make him worthy to survive. The category of worth and right transforms the category of chance and might, and the survival of the fittest is changed from the heartless competition of the ruthless struggle for life into an ethical coöperation of those who have survived to the end of fitting as many as possible to become worthy to survive. Pains and pleasures are substituted for death and life as the sanctions of conduct (p. 388), and, under the guidance of intelligence,

it is possible and even probable that "among the pleasures on which experience lights should be some connected not with the maintenance of the race at its then level, but with the further expansion of its powers. Such an expansion may be of little use to it as a means of survival for the present, but it means progress hereafter. Something like this would seem to be the history of those mathematical and æsthetic 'faculties' which have been a stumbling-block to natural selection" (p. 390).

But natural selection and conscious adaptation are not two antagonistic or incompatible processes. There is evidence that these coöperate in many instances for the preservation of a structure and its function. Thus, to use Mr. Hobhouse's own illustration, the contact of the hairs or the odor of the meat leads the insect to deposit its eggs, and this is a conscious reaction. But these insects attach themselves with equal readiness to any other hairy surface (besides the body of the bee) or deposit their eggs in the flowers of the carrion plant, the smell of which resembles that of putrid meat, and in this way many perish. The so-called law of chance and the principle of natural selection obviously enter here. Thus the actual survival of the type depends upon the concurrent operation of blind natural selection *and* a simple mode of conscious adaptation (cf. pp. 49 and 52).

Just because consciousness follows the center or area of tension or effort in the adaptation, the great mass of intelligent reactions has become automatic: these are preserved as unconscious reactions by heredity. "The smell of putrid meat attracts the gravid carion fly. That is, it sets up motions of the wings which bring the fly to it, and the fly having arrived, the smell and the contact combined stimulate the functions of oviposition. The sight of appropriate food stimulates the chick to peck, just as the contact of the food with the interior of the bill stimulates the swallowing reflexes. And just as the sight of the food stimulates the chick to peck, so the sight of the chick stimulates the hen to cluck, or to scratch for food, or to protect it from danger, and so forth" (p. 53).

Now this may take place all unconsciously, automatically, or its salient feature may be conscious and voluntary. It may be all a mere matter of 'response of inherited structure to stimulus,' and again it may not. That depends upon circumstances. The whole chain of reflexes involved in any such instinctive act would not, of course, be in consciousness. The greater part of any organic circuit has been mechanized and relegated to the unconscious background, the subliminal life. But the salient feature, the prominent or crucial aspect,

will remain in the focus of attention or, if partially mechanized, will be brought back into the focus of consciousness because of the organic tension at that point. If the animal encounters no difficulty in finding the proper place to deposit its eggs or to find its food, these processes might go on in a purely reflex way. But if there is opposition to be encountered and if a search is necessary and if there is danger to be avoided, then it is most natural to suppose that there is a corresponding consciousness which serves both as a monitor and as a guide, not taking the place of instinct or reflex action, but directing it to finer issues or adapting it to varying circumstances. As Mr. Hobhouse himself remarks, it does not follow because an animal performs a given series of acts mechanically on one occasion, that that animal is destitute of consciousness, or that it is not able under *any* circumstances to bring consciousness to bear on the action. Under other and perhaps greater conditions of tension the situation might call forth a conscious reaction. "Many human actions are performed mechanically day by day, but a sufficiently strong stimulus directs attention to them, and brings intelligence to bear" (p. 55).

12. *The Principle of Projected Efficiency*.—Mr. Hobhouse's general conclusion is so similar both in spirit and in mode of statement to that of Mr. Kidd in his recent book on 'Principles of Western Civilization' (Macmillan, N. Y., 1902, pp. 538) that a brief comparison of the two may be instructive. Mr. Kidd writes, "The winning peoples who now inherit the world are they whose history in the past has been the theater of the operation of principles the meaning of which must have at every point transcended the meaning of the interests of those who at any time comprised the existing members of society" (p. 5). "The controlling center of the evolutionary process in our social history is, in short, not in the present at all, but in the future" (p. 6). This Mr. Kidd calls the 'principle of projected efficiency.' It follows that "the determining and controlling end towards which natural selection has been operating, must have been, not simply the benefit of the individual, nor even of his contemporaries, in a mere struggle for existence in the present, but a larger advantage, probably always far in the future, to which the individual and the present alike are subordinated" (p. 50).

Compare with this the words of Mr. Hobhouse. "We can conceive as not indefinitely remote a stage of knowledge in which the human species should come to understand its own development, its history, conditions, and possibilities, and on the basis of such an understanding should direct its own future" (p. 336). "Remote as this

ideal organization of life may be, it is suggested that the trend of theoretical science is towards the discovery of the conditions of human development, while the trend of the ethical spirit is towards making development the supreme object of action. In the union of these movements, human thought would seem to come as near as possible to the limiting conception of the correlation of all experience with all action. At any rate, knowledge of the underlying conditions of development would become the basis of a system of conduct designed to promote development. The life of the species would become self-conscious, and its growth self-determined" (p. 357). "We start with a consciousness limited to the reaction of the moment, and knowing nothing of the past which determines its action, nor of the future which its action will affect. Step by step, as we advance, more of the past and the future come within the scope of intelligence, and we end at a point where all that has made the race what it is is brought into the account and made to prove what it has in it to be. At this stage the mind of man is first fully self-conscious in the strict sense—conscious of its own nature, of the conditions under which it lives and works, of the future to which it may aspire" (pp. 336, 337).

It is stimulating to find in the sequel that the evolutionary theory has really been taken seriously and not, as is the case in so many books which profess to build on the doctrine of evolution, as a mere architectural convenience in the construction of an absolute system on a fixed preconceived foundation. The following quotation may fitly close this review, for it sums up what, in the present writer's opinion, is an insight into the true philosophy of evolution:

"Now it is easy to show that in such a system the ultimate ground of interconnection can neither be purely mechanical nor purely teleological. Reality is or includes a time process. Now, if we take any time process, and consider its beginning, we are dealing with a partial fact, and for every partial fact, thought demands an explanation which will connect it with reality as a whole. For the cause of the origin of a process, then, we may look in two directions, to its results or to its antecedents. If we look to the latter, we are clearly going outside the process. But if the process is one in which the whole nature of our ultimate system is to be expressed, we cannot go outside it without denying the claim of our system to be complete. We are therefore thrown forwards towards the results of this system. But neither can the purpose achieved by the process stand alone, for the necessity of the process must also be made plain. If an unconditional purpose were the secret of the universe, there could be no

explanation of the means, the process, and the effort through which the purpose is realized. From the conception of purpose, then, we are again thrown back on origins, just as these throw us forward to their purpose. We have, in short, to conceive a single principle not realized in full in any one phase, but pervading the whole world-process. In this principle, the possible and the actual in a sense come together, for what it is to be is an integral condition that goes to make the world what it is. We cannot take any phase of reality as an absolute starting-point and regard it as determining everything that follows upon it mechanically, or everything that precedes it teleologically. If we conceive any process as making up the life of an intelligible world-whole, we must conceive its origin and issue as dependent on and implying one another. That is, we must conceive it as determined organically" (pp. 404, 405).

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Psychology, Normal and Morbid. By CHARLES A. MERCIER.
London, Swan Sonnenschein & Co.; New York, The Macmillan Co., 1901. Pp. 518.

There are few fields of psychology that require illumination more urgently than the relations between the normal and the abnormal; there are few topics in psychology concerning which a readable volume would receive a more cordial welcome than the topic which Dr. Mercier's title suggests. One of the phrases that the author lets fall, apropos of a very different application, is that 'the practice in psychology is that anyone may call anything by any name that he pleases.' The restrictions opposed to the indulgence of this propensity in psychology, are perhaps less stringent, yet not different in type, from those obtaining in other disciplines. Yet Dr. Mercier has used—I had almost said abused—this privilege in the correlation of content and title in the present volume.

It is always a delicate, sometimes an impertinent, task to find fault with an author for not doing that which he never intended to do. The 'pursuit of happiness' clause when applied to authorship seems to include the privilege of planning one's own tour, choosing one's own vehicle and route, taking one's own pace, and letting those follow who will. None the less from the point of view of serviceability, either as the record of an individual journey, or more directly as a guide-book to other tourists, the consideration of the probable interest, capacities, general information and equipment of the travelling public, will not