THURSDAY, APRIL 10, 1873

INSTINCT

THE very valuable contribution to Psychology made by Mr. Spalding in his paper on Instinct (*Macmillan's Magazine* for February), and the letters and article which have lately appeared in this Journal, will no doubt stimulate research, and lead to some rational explanation of what has hitherto been enveloped in a mist of metaphysics. Mr. Spalding has not only proved himself an acute thinker, he has shown a rare ability in devising experiments, and we may fairly expect that his researches will mark an epoch. I am the more grateful to him because his instructive results, though seeming to contradict, do really furnish experimental confirmation of the views put forth in my work, now in the press, wherein it is argued that Instinct is *lapsed* Intelligence: that what is now the fixed and fatal action of the organism, was formerly a tentative and discriminating (consequently intelligent) action: in a word that what is now a connate tendency was formerly acquired experience.

There is great need of precise definition of terms. What is Instinct? What is Experience? What is Intelligence? Twenty different writers indicate twenty different things by these terms. They do not distinguish between Instinct and Impulse; between Experience acquired by the individual, and Experience transmitted from ancestors; between Intelligence, the discernment of Likeness and Unlikeness in feelings, and Intellect, the discernment of Likeness and Unlikeness in symbols. Above all they seldom make clear whether they are treating any fact from the psycho*logical* or from the psycho*genetical* point of view, *i.e.* whether they are describing the Anatomy or the Morphology of the Mind. It is, for instance, one thing to affirm that our perception of Space is a perception necessarily conditioned by our organism, and in that sense *à priori*; another thing to affirm that this conditioned structure is itself the evolved result of ancestral experiences of Sight, Touch, and Motion, and in that sense the perception of space is *à posteriori*. The point of difference between the empirical and nativistic schools may be got rid of by such a precision in the question. The vital point will then be between the advocates of evolution and the advocates of creation. Those who hold that the Organism is evolved, must hold that its perceptions (and instincts) are evolved through Experience. Those who hold that the Organism is created, and was from the first what we see it now, must hold that its perceptions (and instincts) are pre-ordained, and have no experiential origin whatever.

Having thus cleared the ground of a mass of obstruction, we may now approach the subject of Instinct. In what sense can it be said to be dependent on Experience? Obviously this cannot be answered till we are agreed on the meaning to be assigned to the term Experience. I have defined it the *registration* of Feeling. And what is Feeling? It is reaction of the sentient Organism under stimulus. This reaction has obviously two factors: the structure of the organism, and the nature of the stimulus. It is not every response of the organ that can be a feeling, it is not every feeling that can be an experience. The secretion of a gland is a response, physiologically similar to the response of a sensory organ; but the former is not a feeling, although it enters as an element into the mass of Systemic sensation; and the response of a sensory organ, although a feeling, will not be an experience unless it be *revivable;* and this revival requires that it should be *registered* in the modification impressed on the sentient structure. It is true that rigorously speaking no body, not even an inorganic body, can be acted on without being modified; every sunbeam that beats against the wall *alters* the structure of that wall; but these minute alterations are not only inappreciable for the most part, by any means in our power, they are also mostly annulled by subsequent alterations. In one sense, therefore, no impression ever excites Feeling without modifying the sentient structure; but some impressions, especially when iterated, produce definite and permanent modifications; and these are registrations capable of revival, *i.e.* of the feelings registered, so that when the organism is stimulated its reaction will be determined by those past reactions, and the product will be a feeling more or less resembling the feelings which were formerly produced. Thus we have Feeling as the reaction of the Organism; and the Organism itself as a structure which has been modified by its reactions on external stimuli. What the structure of the Organism is at any stage determines what will be the kind of sentient reactions it will have. Experience is the registration of Feeling, registered in those modifications, which, because they are modifications of structure, must have corresponding activities of Feeling, and from these spring Actions. To trace the history of these modifications or their feelings is Morphology or Psychogeny; to describe their results is Anatomy or Psychology.

We cannot be in doubt then whether Instinct is or is not dependent on Experience; we can only ask: Is a particular action characteristic of a particular animal species, one that the animal has itself *learned* to perform through the adaptation of its organs, under the guidance of sensible impressions reviving the past impressions of *its* experience; or an action inevitably determined by the reactions of the structure inherited from ancestors, so that sensible impressions revive ancestral experiences registered in the modifications impressed on the structure? The answer in each case can only be approximative; and for this reason: until the organism has the requisite degree of development for the performance of the actions, there can be no manifestation of the instincts, and there are few of the instincts manifested at birth.

How, then, shall we define Instinct? How separate the actions which are congenitally determined, from those which are incidentally determined? Both require the indispensable conditions of an appropriate structure and appropriate stimuli. It is obvious that we cannot fix upon the structure alone; and yet the congenital tendencies of that structure must be taken into account; for we see instincts not manifested until long after many other actions have been acquired—as in the case of the sexual instinct. But if congenital tendencies sufficed, we should call the flowering of plants at their normal season when transplanted to a *different* climate, an instinct. Many would say that an action common to an entire

group of animals must be an instinct, since it could not be acquired through individual experience. But how if the conditions of acquisition are also common to the whole group? Thus an infant certainly learns to scratch itself; since, however it may itch, some considerable experience is necessary before it learns to localise the sensation. As, however, the conditions of this acquisition are common to all children, all learn to scratch themselves. Now in many animals this is an inherited acquisition; they scratch themselves from the first. Whether the infant also inherits a structure which would develop into one as apt as that of the animal, cannot be ascertained; all we know is that the infant's nervous structure is too immature at first to permit the localisation of sensation. How much of the subsequent aptitude is the result of congenital tendency, and how much of acquisition through incidental experiences acting on a predisposed organism, cannot be estimated.*

That we require some character to distinguish the instinctive from the impulsive actions, may be readily shown. No one calls Breathing, Secretion, Excretion, &c., instincts. Yet these are the actions of congenital tendencies in the organism. "A hungry chick," says Mr. Spalding, "that never tasted food, is able on seeing a fly or spider for the first time, to bring into action muscles that never were so exercised before, and to perform a series of delicately adjusted movements that end in the capture of the insect." Every one would pronounce this a typical case of Instinct. Now compare with it the following, which no one would class among the instincts: A newborn animal that has never breathed before is able on first feeling the stimulus of the atmosphere to bring into action a very complicated group of muscles which never were so exercised before, and to perform a series of delicately adjusted movements which end in the aëration and circulation of the blood.

This contrast may lead us to the character sought. Understanding that every line of demarcation in psychical phenomena must be more or less arbitrary, and only justified by its convenience, we may draw such a line between Impulse and Instinct. Impulses are the actions which from the first were fatal, inevitable, being simply the direct reflex of the stimulated organs. Given the respiratory organs and the atmosphere, Respiration is the inevitable result. Given the secretory organ and the plasma, Secretion is the inevitable result. There is no choice, the action either takes place or it does not.

Instincts *are* also fatal, inevitable, but they *were* not always so; the element of choice intervenes; and although the intelligent discrimination may be *almost* entirely lapsed, it never is wholly lapsed. The guiding sensation is still discriminative, selective. Hence instincts vary with varying conditions. Thus the *nutritive impulse* which when unsatisfied causes the uneasiness of desire, and which moves the animal in search of food, is markedly distinguishable from the *instinct* which selects the appropriate food and rejects all the rest. If an animal eats only certain kinds of food, out of many which would be nutritious, it is because these kinds have been selected by it, or by its ancestors. Every chicken, Mr. Spalding assures us, has to learn not to eat its own excrement. "They made this mistake invariably, but they did not repeat it oftener than once or twice." He also has this remark:—"Chickens, as soon as they are able to walk, will follow any moving object; and when guided by sight alone they seem to have no more disposition to follow a hen than to follow a duck or a human being. Unreflecting onlookers when they saw chickens a day old running after me, and older ones following me miles and answering my whistle, imagined that I must have some occult power over the creatures, whereas I simply allowed them to follow me from the first. There is the instinct to follow; and, as we have seen, their ear, prior to experience, attaches them to the right object."

I should rather say, "there is the *impulse to follow*: and the instinct to follow the mother, or a duck, or the master who feeds them, is the selected action which becomes rapidly an organised habit." It is one of the conclusions of my work that all our involuntary and automatic actions, were originally voluntary, and that all instinctive actions were originally intelligent. In the case now under consideration, the impulse to follow is a fixed tendency; the instinct to follow is facultative at first, and becomes fixed by habit, but is always, even when most firmly fixed, guided by discriminating feeling.

To conclude: where there is no alternative open to an action it is impulsive; where there is, or originally was, an alternative, the action is instinctive; where there are alternatives which may still determine the action, and the choice is free, we call the action intelligent.

GEORGE HENRY LEWES

* The examples of dogs and horses finding their way home, however marvellous, cannot be affiliated on Instinct, since it is very far from common to the species: for one dog who finds his way home, hundreds are helpless when lost.

HANDBOOK FOR THE PHYSIOLOGICAL LABORATORY

Handbook for the Physiological Laboratory. By E. Klein, M.D.; J. B. Sanderson, F.R.S.; M. Foster, F.R.S.; and T. L. Brunton, M.D., D.Sc. (Churchill.)

STUDENTS of chemistry have, for a long time, by means of the works of Fresenius and others, had the opportunity, almost unaided, of verifying for themselves most of the experimental results of which they hear in lectures, and read in text-books; and thus many are able, before they have finished their educational course, to obtain a thorough practical knowledge of the science. Such has not been the case with regard to physiology; the subject is less advanced, and has progressed more slowly; perhaps this is because the descriptions of the methods by which the ends have been arrived at, as given by lecturers and writers, are incomplete and insufficient. The work before us is the first important attempt that has been made to put the commencing physiologist in a fair position to begin original work on the subject, by giving him the necessary directions for himself performing many of the fundamental experiments on which the science is based. Whether physiology in its most comprehensive sense, as understood by the authors of this work in their title, is a single branch of science which can be thus treated in its unity, or whether it ought to be divided up and incorporated with others already established, is a point which has not yet been satisfactorily settled, and which the perusal of this book may assist in proving.