The Open Court

A MONTHLY MAGAZINE

Devoted to the Science of Religion, the Religion of Science, and the Extension of the Religious Parliament Idea

Founded by Edward C. Hegeler

VOL. XXXVIII (No. 10) OCTOBER, 1924 (No. 821)

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THE ORIGIN AND DEVELOPMENT OF INSTINCTS

BY JOHN J. BIRCH

IN ORDER to adequately understand the relationship between instincts and life it is paramountly important to secure a comprehensive understanding of just what is meant by them. There is a formidable difficulty encountered in defining instincts for no agreement has been established as to when they begin to control actions or the relationship between them and reason.

The scientific world, however, has come to the general agreement that their apparent function is to fit the organism to the world; to enable it to battle for existence and to hold its place in spite of opposing forces and enemies and that they are operative in both the plant and animal kingdoms. According to Paley: "Instinct is a propensity prior to experience and independent of instruction." This definition instead of establishing any conception of an instinct, is simply a dogmatic assertion from which questions branch off in all directions. Wundt held that, "instinctive movements were those which originally followed upon simple or compound voluntary acts, but which have become wholly or partly mechanized in the course of individual life or generic evolution." In this definition, Wundt leads one to believe that instincts were not always the same, but have undergone modifications or have lapsed into reflex actions. Spencer, makes a more positive statement than Wundt, for he holds without any hesitancy that "instincts may be described as compound reflex actions." Darwin gives a very broad and comprehensive understanding of the term instinct when he says, "An action which we ourselves require experience in order to enable us to perform, when performed by an animal without experience and without knowing for what purpose it was performed is usually said to be instinctive." He makes this reservation, however,

"that a little dose of judgment or reason often comes into play even with animals low in the scale of nature."

Thorndike, of the modern school, formulates a definition very closely related to the one given by Darwin. He believes "that anything we do without having to learn to do it, in brief is an instinct—an act that is the result of mere inner growth, not training or experience." MacDougall in his *Social Psychology* suggests an inclusive definition of instincts. He holds that they are "innate specific tendencies of mind that common to all members of one species; racial characteristics which have been slowly evolved in the process of adaptation of the species to their environment and that can neither be eradicated from the mental constitution of which they are innate elements, nor acquired by individuals in the course of their lifetime." This author holds, therefore, to the notion that instincts are forces by virtue of which the organisms made their adaptations—obscure directive powers which watch over the development of the organism. W. T. Hornaday, of the New York Zoological Park, adheres to this conception for it is his belief that an instinct is the knowledge or impulse which animals and men derive from their ancestry by inheritance and which they obey either consciously or subconsciously in working out their own preservation, increase and betterment."

Angell defines instincts in terms of neural activity for he states that instincts "represent structurally performed pathways in the nervous system and stand functionally for effective inherited coordinations made in response to environmental demands." He further contends that it is impossible to draw any sharp line between instincts and reflex actions—that there is an overlapping of one into the other. These innate bonds may be ready to function shortly after birth or they may remain inoperative until a later stage in the development of the organism. As Averill has stated, "Nature does not turn the whole force of the racial past into the sluceways of life at one floodtide, rather many tides are freighted with it."

From these conceptions it may be deduced therefore that by instinct is implied the generic term comprising all those faculties of mind which lead to the conscious performance of actions which are adaptive in character, but pursued without necessary knowledge of the relationship between the means employed and the ends attained. Thus instincts may be characteristic both of

plants and animals for in both there is an adaption of means to ends as well as an attempt to preserve and propagate the specie. Because of structural differences, nevertheless, all of the instincts manifest in the animals do not apply to plants and vice versa. Those which have a feeling nature such as parental love, sympathy or play belong distinctly to the animal type; while food-getting and self-preservation belong equally well to either plants or animals.

The Relation of Instincts to Reflex and Automatic Acts

There are some authorities who argue that reflex and automatic acts are synonymous with instincts inasmuch as they all operate for the well-being of the organism. Such a belief does not harmonize with experience for the reason that reflex acts presuppose experience, gained in most cases by methods of trial and error and an improvement upon subsequent trials or by muscular motivation—that is, there must be an excitation by a stimuli without the organism. A young child will not unconsciously pull its hand away from a hot iron until after the individual has suffered the heat, but the eyelid will close due to an external stimulus as will also sneezing or pupilary activity. The mind then stores the experience and preserves itself from similar future experiences or unconsciously repeats the acts by the use of reflexes. Automatic acts such as breathing, respiration or circulation do not depend upon either a racial inheritance or muscular excitation, but upon a nervous stimulus, for such activities are wholly, or in part, within the organism itself. Thus the chemical condition of the blood may be responsible for changes in circulation and respiration, or the presence of food in the stomach incite the digestive processes.

There is no experience or nerve excitation necessary in the operation of instincts, for they are obviously further removed from purely physical life than are reflexes or automatic acts. The young birds on their first migratory journey or the salmon on their way to fresh water have not previously passed through a similar experience or are they nervously excited, but are directed by an inner urge or wisdom.

It is probable that instincts are persistently followed from the mere inner force of inheritance without the stimulus of either

pleasure, pain or mental motivation. The spiders as they spin their webs with mathematical precision can hardly be said to be impelled by some exterior excitation. A newly-hatched chick is able to run about and pick up certain small objects which prove to be food and sustain life. It scarcely needs education, and the products of an incubator, having no link with the past of their race, except the germ plasm, thrive as well as those that have a mother's care. Bees in collecting honey and storing it for the winter months; birds as they choose sights for their nests, line them warmly and hide them skillfully, or dogs as they bury their bones and come to scratch for them at subsequent times are all motivated in so doing by instinct. Unlike reflexes or automatic acts, instinctive actions strive towards a change of situation of a particular kind which alone can satisfy the impulse and allay the appetite and unrest of the organism.

Origin of Animal and Plant Instincts

In order to seek for the origin of instincts it is not necessary that they be divided into the previously mentioned groupings—namely plant and animal. Of all the instincts, there are only two possible explanations of their origin. They were either all fixed in the organism in its simplest state of existence and insusceptible to change, or they have been developed from a single potentiality as the environmental surroundings of the organism demanded. This theory does not imply that the organism also contains all the other potentialities of its nature which would have been actualized if conditions had been favorable. Development therefore is not an unfolding of all the innate characteristics but a process of acquisition forced upon the individual by environment. To illustrate by an analogy from the objective world. A lead pencil contains the potentiality or ability to make black lines on a white surface. When in the hands of a child it can be used to make only inarticulate marks of no significance, but when in the hands of a poet or philosopher it can be used to trace the profoundest thoughts of humanity. The pencil is only an instrument in the hands of an individual—it possesses only potentiality not innate possibilities. The environment in which it is placed posits its use. To illustrate this same thought from the animate world. An acorn possesses the possibility of growth. When

planted on an open hillside rich in plant nourishment, water and sunshine, it will build its broad base, send each root deep into the soil and strengthen most the side which must bear the wind. This instinctive law of growth provides for its preservation according to the conditions which must be met; but planted in a shady unfertile spot it will make a brave attempt to grow, but due to a poor environment it will fail. The potentiality for growth was in its possession, but environmental conditions did not augment its achievement. From this single potentiality to grow developed the other factors necessary for its actualization. Activities leave their mark on the motivating dispositions of organisms, that is, environment exerts a profound influence and as a result, there develops through successive trials and errors the ability to cope with environment.

The first theory is untenable. The theories of evolution have undeniably established the fact that animals have gone through various modifications, resulting in the extinction and production of various forms. In the course of this development the environments have been different, thus making it impossible for a single set of congenital, unchangeable instincts to survive. In fact the very process of evolution would be blocked were the instincts insusceptible to change.

The second theory presumes that the lowest forms of organisms possessed a certain physiological construction which was subject to chemical laws. The organism for instance possessed a cell wall through which nourishment passed by means of osmosis, absolutely uncontrolled by the organism but obeying nature's laws. The single potentiality then was the ability to grow or enlarge. The passage of nourishment naturally caused an enlargement of the structure until the cell wall became parted and the organism split in two, thus giving birth to a new bit of life. The one-celled animals are excellent examples of this principle. Figuratively speaking their insatiable desire is for growth and propagation and to do this successfully demanded a nourished organism for its fulfillment. This single potentiality for absorbing food and consequent growth was innate with life—it was one of nature's fixed laws and from it have been developed during the race for existence what are termed the more complex instincts. The young bird just raises its head and opens its bill to be fed. Its first instinct is for food and from it develops the other instinctive bodily activities.

By the effect of habit in successive generations and the struggle for the survival of the fittest, naive mental activities were developed which later became stereotyped into permanent instincts. Just as in the lifetime of the individual, adaptive actions may by frequent repetitions become automatic, so in the lifetime of the species, actions may by frequent repetitions and heredity so write their effects on the nervous system that the latter is prepared even before individual experience to perform mechanically adaptive actions. Environmental demands made upon the organism then tended to modify the original impulses, and caused the genesis of new adaptive measures which in turn developed into instincts and which later through their multiplication and coordination graduated in the course of hundreds of thousands of years into reflex actions, or more properly called instincts, and innate characteristics that have proved beyond measure their genuine value. Instincts are eminently valuable and therefore admit of being modified as modifying circumstances require. Their variability gives them plasticity whereby they may be moulded always to fit an environment however continuously the latter may be subject to gradual change. The leatherback turtles were originally land animals with firm bony carpaces. Later they became sea turtles and lost their armament. Still later they were forced to return to land due to a change of environment and then developed a bony armament quite distinct in design from their former one. Later they return to the sea, lost their armament and acquired their present leathery covering on account of which they are known by that name. Similar reversed or altered adaptations have been found to have taken place in the kangaroo.

Activities leave their mark on the motivating disposition of organisms as well as do environmental conditions—in fact, their influence becomes an integral part of the organism. Consequently organisms become necessarily adaptive since they are to a large degree products of their environments. Adaption therefore is not to be regarded as due to a modification of innate characteristics, or to the fact that certain instincts are finding expression in modified ways. This would be impossible for the reason that the situation or environment precedes the organism's reaction therefrom. Instincts wll also not lose their fixed and untaught character and be replaced by others performed by the aid of free will. On the other hand, some intelligent actions after being performed during a number of generations become converted into instincts

and are inherited as illustrated by the domestication of animals and the culture of plants.

Therefore adaption cannot be regarded as due to modification of innate characteristics or that the instincts are finding expression in modified ways for instincts are the outgrowths of situations. They express themselves in the only way which is possible to do so. Modified instincts are only products of modified situations and not forces that modify their responses to meet the demands of a particular situation.

The Inter-Relation of Human Instincts

The equipment of instincts with which human beings are endowed are mostly remnants of instincts which have been carried over from his animal ancestors. They have been of such supreme value that they have remained in spite of revolutionary changes. Yet it was only a comparatively few years ago that James wrote: "Nothing is commoner than the remark that man differs from lower creatures by the almost total lack of instincts and the assumption of their work by reason." However any fair-minded scientific observer of instincts will admit that man possesses a vast array of instincts, yet not anything like the picturesque instinctive repertoire of animals.

The equipment of instincts with which the human being is endowed at most must be considered in two ways. They consist in the first place of definite and unlearned mechanisms of behavior and fixed original responses to given stimuli. These are at the same time the original driving forces of action, very closely related to habit in many instances. Instincts and the capacity to form habits, while related functions, are present in any animal in reverse ratio. Man excells in his habit forming capacity for the reason that from the activity of his mental faculties he cannot avoid reflection; past impressions and images are incessantly and clearly passing through his mind and this ideational activity will in turn produce habits of activity which will tenaciously hold the individual in stated grooves of conduct. It is these which are often mistaken for instincts in man. It has often been assumed that by habit, man learned to be social but animals have a gregarious instinct which has remained with them until manifest in the actions of mankind. Animals in the first place are social

and feel in consequence uncomfortable when separated from each other and comfort while together. All animals living in a body which defend themselves or attack their enemies in concert, must be indeed in some degree faithful to one another and those which follow a leader must be in some degree obedient with those animals which were benefited by living in close association —the ones which took the greatest pleasure in society would best escape various dangers while those which cared least for their comrades and lived in solitude would perish in greater numbers. Thus the promulgators of society were left and this propensity passed on from generation to generation.

The child, in common with certain animals, uses instinctively certain kinds of vocal expression, which are chiefly those of emotions. For example, fear is universally expressed by a cry or shriek, which is the same among all mankind, and which we recognize without having been taught its signficance. It came to us from our animal ancestors whose habit it is to utter articulate sounds of a special nature while in pain. In the same way anger, affection, or the finer shades of feeling may be expressed and recognized in the animals, as also in mankind. These forms of tone quality or the inflection by which the emotions are conveyed to others do not merely exist as separate forms of expression, but they proceed as a means of giving definite significance to the words by which we learn to express our ideas. The speech then of man, is both the expression of ideas by articulation of particular words and the accompaniment of certain tone inflections and even gestures by means of which the feeling attitudes which accompany the ideas are conveyed.

A great many of the pleasures derived from communing in solitude with nature have their roots in the remote past, when man lived in far closer contact with her than he does today. Those countless ages which he lived in caves or roamed the prairies as a hunter and of the still earlier days when he lived in the branches of the forest, have indelibly stamped their memory on mankind. Those who cannot spend time or money for long excursions go picnicking, blackberrying, nutting or strawberry picking like their remote ancestors who lived by gathering nuts and berries. All are attracted by the joys of the open road and the open fire. Even garden parties or tea on the lawn are the last feeble response of civilization to the same powerful summons.

Man has carried over many instincts from his tree life. To hold his poise on branches was more important than the quest of food itself, for a single slip might have proved fatal. To avoid this, a highly developed instinct was essential to which all habitual automatic reactions were closely connected with this maintaining of bodily balance. The necessity was paramount for tree life, for every relaxation might have resulted in the sudden cessation of life itself. At night there were many difficulties to contend with. Sleep must come and how then were involuntary movements to be controlled? In particular, how could sudden movements upon awakening be avoided? The answer was found in the instinct to freeze into absolute immobility when startled by fright. Man when violently aroused at night by a loud noise will become rigid with expectancy which is nothing more than the operation of this ancient instinct.

Prenative man was an animal that lived and worked by day. His habits were not nocturnal and he seldom by choice went forth from his lair during the hours of darkness. This love of daylight and the corresponding aversion to darkness was probably due to the great reliance placed upon the sense of sight. It is this instinct which no doubt accounts for mankind's instinctive dislike and fear of darkness.

The sense of place and in particular the power to find one's way back home is very strongly developed instinctively in all roving animals as well as man. As it survived in ourselves, it is called a sense of direction; but it is also a sense of position, of one's own position relative to the landscape and in particular to one's starting place.

It is seen then that a great many of our actions may be accounted for by the survival of instincts which once had survival value, but have outlived their day. They may be referred to prehistoric times in general or to a special aspect or period, such as that during which man lived for the most part in caves. But before the cave period came the prairie period with the conclusion of which we are familiar. It would be strange if cave life, prairie life and primitive civilization had not left many traces in the form of instincts peculiar to those stages of man's evolution.

The most usual explanation of instinct has relied upon the so-called generic method and assumes the social customs which are observed among civilized people and the surviving instincts are the result of stamping in through long experience of some

reaction which has been inherited by each succeeding generation. They all have their roots far into the remote ancestry of the race instead of recent periods. The environment of man has undergone profound changes during the last hundred years and it is not irrevalent to say that as a result of this rapid change in culture, man finds himself with a culture that is far removed from the instincts which proved their fitness for survival in an environment extremely different from that in which they are expected to function at present.

It is of enormous advantage that we possess instincts, for on the whole they act in the right direction and they enable mankind to meet emergencies for which slow-moving reason would be too late. But there is no guarantee that an instinct will stop acting where it should. The difference between primitive and civilized life appears especially in the degree to which rational control has been established for such instinctive promptings. In man, reason must function in conjunction with instinctive promptings in order to secure the rational relation of desire and ultimate ends to be achieved. It is only this which will produce an ethical culture and an enduring civilization.