EMOTION IN ANIMALS.

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Whatever may be thought of Darwin's theory as a whole—and candor compels us to admit we do not take kindly to it—no one can fail to admire his persistent industry, or the frankness with which he confesses the defects of his demonstrations.

In his earlier and well known work on the "Origin of Species," his aim is to establish the theory of *Evolution by Natural Selection;* in his "Descent of Man," which subsequently appeared, *Sexual Selection* enters in as an important factor in the process of development, supplementing the principle enunciated in the first. In his recent work, just from the press of the Messrs. Appleton, "Expression of Emotions in Man and Animals," he pursues a somewhat different course. Assuming the theory of evolution to be true, he proceeds to trace certain modes of expression, attitudes, gestures, etc., to their source; and expresses the conviction that as we can thus account for some of these, further investigation will show all habits and customary modes of action to depend on principles analagous, if not identical.

To begin: Any act once performed and found to be serviceable will be repeated, and may become a *habit*, and that habit may be retained long after the act has ceased to be of service. A man about to fall extends his arms to break the force of the blow: he did it purposely at first—that is, in some remote generation—the act grew into a habit, was inherited and strengthened in succeeding generations; and now he does it unconsciously, as well when falling on a bed of down as on a solid rock. A man going out in the street puts on his gloves, without thinking what he is doing, or why he does it. It is a habit; and may seem a very simple operation, requiring no attention: but let a person unaccustomed to the use of gloves attempt to put on neatly fitting kids, and he will find the process not so simple.

When a man vehemently rejects a proposition, he generally shuts his eyes and turns away his face; when he readily accepts a proposition, he opens his eyes widely and nods his head. In the one case he acts as if he saw the matter clearly; in the other, as if he could not or would not see it. And he will act the same when he is alone and the propositions come to him by letter, as when in company, though the acts are obviously of no use whatever.

There are other acts which have their origin in a kind of sympathy. Let a public speaker, or especially a singer, become hoarse, and all the more sensitive persons in the audience will incline to clear the throat. Children learning to write often thrust out the tongue and twist it about, corresponding somewhat with the movements of the pen.

Acts which are not dependent on the will or consciousness are termed *reflex actions.* Under this head may be classed coughing, sneezing, and probably breathing; and indeed the *habits* already alluded to, may graduate into reflex actions, as they become fixed and uniform, and are unconsciously performed. Some nervous action is always supposed to precede muscular action. That is to say, the natural or primitive order of nervous action is this: the sensory nerve-cells receive an impression, transmit it to the brain, and an order is sent out from the brain to the motor nerve-cells for the necessary movement. If a noxious insect alights on the face, the fact is reported to the brain through the nerves of sensation, and the brain sends an order through the nerves of motion in the hand for its removal; and this process is gone through in every similar case.

In *reflex action* the sensory nerves are supposed to act directly upon the motors, the brain not being consulted at all. And this is presumed to be in many cases, if not all, the remote result of an acquired habit. If a drop of acid be placed on the thigh of a recently decapitated frog, it will rub it off with its foot. Being headless, of course there is no brain to consult, and whatever of nervous action there is in the case must be between the two classes of nerve-cells, and the action is purely reflex.

Again, there is an *antithesis* in actions, as there is in emotions; and the one corresponds to the other. And antithetical actions may grow into habits as readily as any other. A man when excited and determined assumes a certain attitude and appearance; his muscles are tense, his nerves strained, his hands clenched, his brow corrugated, and the corners of his mouth raised. When in a state of helplessness, on the contrary, his nerves relax, his muscles are flabby, his hands open, his brow smooth (unless he be also in pain), and the corners of his mouth are drawn down. The attitudes and expressions are as directly opposite as the emotions. So the actions accompanying hatred on the one hand and affection on the other, are not only unlike, but are the antitheses of each other.

That many acts done under the influence of emotion are utterly useless, is sufficiently obvious. Children clap the hands for joy; the dog careers gaily about when starting out with his master for a walk. It is what Herbert Spencer would call the "overflow of nerve-force." In a fit of anger a child may scream and jump wildly up and down. A woman in like circumstances may resort to tears; while a man, ashamed to do that, will probably *bang* the door as he leaves the room. These are so many convenient methods of expending the surplus nervous force generated under the excitement of the moment, and which must have vent in some way.

Turning our attention now more particularly to the inferior animals. As a man in the act of falling, even on a soft bed, extends the arms though there is no danger, so the dog performs many acts from mere habit, long since acquired, but now of no possible use. A dog about to lie down on the floor is often observed to turn round and round and sometimes scratch the carpet, in a senseless way—a reflection of the custom of his wild progenitors generations back, as they trampled down the grass or scooped out a bed preparatory to going to sleep. The act had a definite purpose at first, and though it is useless now, the habit is retained. A dog on the road, when he discovers a strange dog approaching, immediately lowers his head, and sometimes crouches as if for concealment, till he can look the newcomer over, and make up his mind what course to pursue. It is in this way, possibly, that the Pointer and Setter acquired their peculiar habits. A dog listening attentively, or watching some object closely, will generally stand with one foot raised, as if for a cautious approach. The Kingfisher among birds, on seizing a fish beats it to death to make sure of his prey. So it is observed that the Kingfisher in the Zoological Gardens, on receiving a piece of raw beefsteak, immediately proceeds to beat it before attempting to eat. The act is useless, but its origin is sufficiently apparent.

The principle of antithesis already announced is especially noticeable in animals, whence Mr. Darwin, in accordance with his favorite theory, traces the origin of like qualities in man. A dog, approaching another in a hostile mood, walks upright and very stiffly; his tail is erect, his ears pointed forward, and the hair bristles along his back. When in an opposite mood, his muscles relax, his ears and tail droop, and his hair is smooth. Nothing is more ludicrous than the suddenly changed appearance of a dog on suspiciously approaching a supposed stranger and all at once discovering him to be his master, to whom he is fondly attached. His whole appearance undergoes a sudden transition, from the expression of suspicion and possible hostility to that of extravagant joy and affection, with a possible trace of shame at having been deceived. In the first instance, his attitude is preparatory to a trial of strength; in the last case his movements are of no service whatever, and only express a reaction from his former state. The difference in the appearance of a cat when in rage or terror, with arched back and snarling countenance, and when affectionately rubbing against the legs or chair of her master, is familiar to every one.

Many animals have a habit of erecting the hair or feathers when assuming a hostile attitude. This is common to the cat on meeting a dog, the hen in defending her brood, and many others. Though the act has now become reflex, and is probably performed without thought or intention, it may have originated in a desire of the animal to appear to his enemy as large and terrible as possible. It is observed, however, that the tiger, though an animal of the cat kind, does not erect the hair in anger, and the reason assigned is, that he is sufficiently terrible to an antagonist without any special effort to appear so.

Many animals, especially such as use the teeth in fighting, expose the teeth when angry whether they intend to fight or not. A trace of this habit is distinctly seen in man, who when enraged almost invariably shows his teeth: "A faint echo," says Dr. Maudsley, whom Darwin approvingly quotes, "from the far distant past, testifying to a kinship that man has almost outgrown."

Sneering in man is essentially the same as snarling in the dog. In either case, certain facial muscles are contracted so as to raise the upper lip on one side, exposing the canine or eye-tooth. Expressions of emotion which are formed to be common to animals and men, are especially strong in the insane and the idiotic, in whom, of course, the moral sentiments are less active, and who therefore exhibit more of the animal qualities. Children pout, or protrude the lips, in a fit of ill-humor, and some species of the monkey tribe have a like habit.

Weeping is generally supposed to be a purely human prerogative, but one monkey in the Zoological Garden was observed to weep when sorely grieved; and elephants, when first captured and bound, are said sometimes to pour out floods of tears. Children may scream and cry from the hour of birth, but rarely weep—shed tears—before the age of three months. The lachrymal glands seem to require practice, or do not reach functional activity, till the muscles about the eye have been somewhat exercised. In the act of screaming the orbicular muscles contract, so that the eye is partially closed, and this is necessary to save it from injury. By this contraction of the muscles the lachrymal or tear glands are exercised, and the secretion of tears begins. In the act of weeping the muscles about the eye are especially contracted, the lachrymal glands especially exercised, and hence the continuous flow of tears. Weeping may attend other acts, purely muscular, or having their origin in emotion, as coughing, laughing, etc., since in these the orbicular muscles are forcibly contracted. Notably also tears may flow under the effects of emotion, though the expression in the face may be repressed. In this case the tears are the result of habit in the lachrymal glands, while the restraint of the features results from habit in the individual.

The origin and nature of the frown and the blush are traced out with much curious detail in the volume before us, but the above, we trust, will give a sufficiently comprehensive view of the work.

Were we to attempt a criticism of Darwin, we should say that he burdens his subject with illustrations; and in his anxiety to multiply examples uses those so evidently far-fetched, and so indirect in their bearing on the matter in hand, as to weaken rather than strengthen his argument.

We may admit that within certain limits—and those limits we may not now be able to define—there is a correspondence between the expression of similar emotions in animals and men. But when a man in a fit of anger brings his fist down forcibly on the table, and the Gorilla is observed in like circumstances to strike the ground with his paw, what is it in either case but a convenient method of expending the *nervous, vital,* or *emotional* force—whatever it is—generated under excitement? There is a similarity between the pouting of a sulky child and a sulky chimpanzee. But unfortunately for the theory, the chimpanzee pouts when *angry* and when greatly *pleased,* and the child does neither.

It is certainly true that the mouth opens wider to emit a high note than a low one; but is this a consequence or a cause? Does not the sound depend on the shape of the mouth, rather than the shape of the mouth on the quality of the sound?

We can easily conceive how a simple act, often repeated, may grow into a habit and be transmitted from one generation to another, assuming perhaps the nature of a reflex action; but when it is assumed that coughing and sneezing were once voluntary acts, and are therefore only acquired habits it is too much for our credulity, even on the supposition that it may have grown up "through a long line of semi-human progenitors."

The suggestion that the tears shed when long-parted friends meet are occasioned, even in part, by "vague thoughts of the grief that would have been felt had they never met," we submit is straining a point quite beyond what it will bear. And when the author assumes, because the Wolf or Jackal does not bark, that the barking of the dog is not natural, but an accomplishment acquired by attempted imitation of man, we again respectfully demur.

And finally, it seems to us, with all Mr. Darwin's mer-

its, that he fails to appreciate the very unstable character of a structure consisting of hypotheses built upon hypotheses, and whose sole foundation is hypothetical. Hypothesis may be a necessary element of all theory, but unless it has a basis of fact, the superstructure can at best have but a precarious support.