THE

EXPRESSION OF THE EMOTIONS

IN

MAN AND ANIMALS.

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WITH PHOTOGRAPHIC AND OTHER ILLUSTRATIONS.

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CHAPTER I.

GENERAL PRINCIPLES OF EXPRESSION.

The three chief principles stated—The first principle—Serviceable actions become habitual in association with certain states of the mind, and are performed whether or not of service in each particular case—The force of habit—Inheritance—Associated habitual movements in man—Reflex actions—Passage of habits into reflex actions—Associated habitual movements in the lower animals—Concluding remarks.

[...]

I. *The principle of serviceable associated Habits*.—Certain complex actions are of direct or indirect service under certain states of the mind, in order to relieve or gratify certain sensations, desires, &c.; and whenever the same state of mind is induced, however feebly, there is a tendency through the force of habit and association for the same movements to be performed, though they may not then be of the least use. Some actions ordinarily associated through habit with certain states of the mind may be partially repressed through the will, and in such cases the muscles which are least under the separate control of the will are the most liable still to act, causing movements which we recognize as expressive. In certain other cases the checking of one habitual movement requires other slight movements; and these are likewise expressive.

[...]

With respect to our *first* Principle, it is notorious how powerful is the force of habit. The most complex and difficult movements can in time be performed without the least effort or consciousness. It is not positively known how it comes that habit is so efficient in facilitating complex movements; but physiologists admit[2] "that the conducting power of the nervous fibres increases with the frequency of their excitement." This applies to the nerves of motion and sensation, as well as to those connected with the act of thinking. That some physical change is produced in the nerve-cells or nerves which are habitually used can hardly be doubted, for otherwise it is impossible to understand how the tendency to certain acquired movements is inherited. That they are inherited we see with horses in certain transmitted paces, such as cantering and ambling, which are not natural to them,—in the pointing of young pointers and the setting of young setters—in the peculiar manner of flight of certain breeds of the

pigeon, &c. We have analogous cases with mankind in the inheritance of tricks or unusual gestures, to which we shall presently recur.

[2] Müller, 'Elements of Physiology,' Eng. translat. vol. ii. p. 939. See also Mr. H. Spencer's interesting speculations on the same subject, and on the genesis of nerves in his 'Principles of Biology,' vol. ii. p. 346; and in his 'Principles of Psychology,' 2nd edit. pp. 511-557.

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To those who admit the gradual evolution of species, a most striking instance of the perfection with which the most difficult consensual movements can be transmitted, is afforded by the humming-bird Sphinx-moth (*Macroglossa*); for this moth, shortly after its emergence from the cocoon, as shown by the bloom on its unruffled scales, may be seen poised stationary in the air, with its long hair-like proboscis uncurled and inserted into the minute orifices of flowers; and no one, I believe, has ever seen this moth learning to perform its difficult task, which requires such unerring aim.

When there exists an inherited or instinctive tendency to the performance of an action, or an inherited taste for certain kinds of food, some degree of habit in the individual is often or generally requisite. We find this in the paces of the horse, and to a certain extent in the pointing of dogs; although some young dogs point excellently the first time they are taken out, yet they often associate the proper inherited attitude with a wrong odour, and even with eyesight. I have heard it asserted that if a calf be allowed to suck its mother only once, it is much more difficult afterwards to rear it by hand.[3] Caterpillars which have been fed on the leaves of one kind of tree, have been known to perish from hunger rather than to eat the leaves of another tree, although this afforded them their proper food, under a state of nature;[4] and so it is in many other cases.

[3] A remark to much the same effect was made long ago by Hippocrates and by the illustrious Harvey; for both assert that a young animal forgets in the course of a few days the art of sucking, and cannot without some difficulty again acquire it. I give these assertions on the authority of Dr. Darwin, 'Zoonomia,' 1794, vol. i. p. 140.

[4] See for my authorities, and for various analogous facts, 'The Variation of Animals and Plants under Domestication,' 1868, vol. ii. p. 304.

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The power of Association is admitted by everyone. Mr. Bain remarks, that " actions, sensations and states of feeling, occurring together or in

close succession, tend to grow together, or cohere, in such a way that when any one of them is afterwards presented to the mind, the others are apt to be brought up in idea."[5] It is so important for our purpose fully to recognize that actions readily become associated with other actions and with various states of the mind, that I will give a good many instances, in the first place relating to man, and afterwards to the lower animals. Some of the instances are of a very trifling nature, but they are as good for our purpose as more important habits. It is known to everyone how difficult, or even impossible it is, without repeated trials, to move the limbs in certain opposed directions which have never been practiced. Analogous cases occur with sensations, as in the common experiment of rolling a marble beneath the tips of two crossed fingers, when it feels exactly like two marbles. Everyone protects himself when falling to the ground by extending his arms, and as Professor Alison has remarked, few can resist acting thus, when voluntarily falling on a soft bed. A man when going out of doors puts on his gloves quite unconsciously; and this may seem an extremely simple operation, but he who has taught a child to put on gloves, knows that this is by no means the case.

When our minds are much affected, so are the movements of our bodies; but here another principle be-

[5] 'The Senses and the Intellect,' 2nd edit. 1864, p. 332. Prof. Huxley remarks ('Elementary Lessons in Physiology,' 6th edit. 1872, p. 306), "It may be laid down as a rule, that, if any two mental states be called up together, or in succession, with due frequency and vividness, the subsequent production of the one of them will suffice to call up the other, and that whether we desire it or not."

sides habit. the undirected overflow of nerveforce, partially comes into play. Norfolk, in speaking of Cardinal Wolsey, says—

"Some strange commotion
Is in his brain; he bites his lip and starts;
Stops on a sudden, looks upon the ground,
Then, lays his finger on his temple: straight,
Springs out into fast gait, then, stops again
Strikes his breast hard, and anon, he casts
His eye against the moon: in most strange postures
We have seen him set himself."—*Hen. VIII*. act 3. sc. 2.

A vulgar man often scratches his head when perplexed in mind; and I believe that he acts thus from habit, as if he experienced a slightly

uncomfortable bodily sensation, namely, the itching of his head, to which he is particularly liable, and which he thus relieves. Another man rubs his eyes when perplexed, or gives a little cough when embarrassed, acting in either case as if he felt a slightly uncomfortable sensation in his eyes or windpipe.[6]

From the continued use of the eyes, these organs are especially liable to be acted on through association under various states of the mind, although there is manifestly nothing to be seen. A man, as Gratiolet remarks, who vehemently rejects a proposition, will almost certainly shut his eyes or turn away his face; but if he accepts the proposition, he will nod his head in affirmation and open his eyes widely. The man acts in this latter case as if he clearly saw the thing, and in the former case as if he did not or would not see it. I have noticed that persons in describing a horrid sight often shut their eyes momentarily and firmly, or shake

[6] Gratiolet ('De la Physionomie,' p. 324), in his discussion on this subject, gives many analogous instances. See p. 42, on the opening and shutting of the eyes. Engel is quoted (p. 323) on the changed paces of a man, as his thoughts change.

their heads, as if not to see or to drive away something disagreeable; and I have caught myself, when thinking in the dark of a horrid spectacle, closing my eyes firmly. In looking suddenly at any object, or in looking all around, everyone raises his eyebrows, so that the eyes may be quickly and widely opened; and Duchenne remarks that[7] a person in trying to remember something often raises his eyebrows, as if to see it. A Hindoo gentleman made exactly the same remark to Mr. Erskine in regard to his countrymen. I noticed a young lady earnestly trying to recollect a painter's name, and she first looked to one corner of the ceiling and then to the opposite corner, arching the one eyebrow on that side; although, of course, there was nothing to be seen there.

In most of the foregoing cases, we can understand how the associated movements were acquired through habit; but with some individuals, certain strange gestures or tricks have arisen in association with certain states of the mind, owing to wholly inexplicable causes, and are undoubtedly inherited. I have elsewhere given one instance from my own observation of an extraordinary and complex gesture, associated with pleasurable feelings, which was transmitted from a father to his daughter, as well as some other analogous facts.[8]

[7] 'Mécanisme de la Physionomie Humaine,' 1862, p. 17.

[8] The Variation of Animals and Plants under Domestication,' vol. ii. p. 6. The inheritance of habitual gestures is so important for us, that I gladly avail myself of Mr. F. Galton's permission to give in his own words the following remarkable ease:—"The following account of a habit occurring in individuals of three consecutive generations is of peculiar interest, because it occurs only during sound sleep, and therefore cannot be due to imitation, but must be altogether natural. The particulars are perfectly trustworthy, for I have enquired fully into them, and speak from abundant and independent evidence. A gentleman of considerable position was found by his wife to have the curious trick, when he lay fast asleep on his back in bed, of

Another curious instance of an odd inherited movement, associated with the wish to obtain an object, will be given in the course of this volume.

There are other actions which are commonly performed under certain circumstances, independently of habit, and which seem to be due to imitation or some sort of sympathy. Thus persons cutting anything with a pair of scissors may be seen to move their jaws simultaneously with the blades of the scissors. Children learning to write often twist about their tongues as their fingers move, in a ridiculous fashion. When a public singer suddenly becomes a little hoarse, many of those present may be heard, as I have been

raising his right arm slowly in front of his face, up to his forehead, and then dropping it with a jerk, so that the wrist fell heavily on the bridge of his nose. The trick did not occur every night, but occasionally, and was independent of any ascertained cause. Sometimes it was repeated incessantly for an hour or more. The gentleman's nose was prominent, and its bridge often became sore from the blows which it received. At one time an awkward sore was produced, that was long in healing, on account of the recurrence, night after night, of the blows which first caused it. His wife had to remove the button from the wrist of his night-gown as it made severe scratches and some means were attempted of tying his arm.

"Many years after his death, his son married a lady who had never heard of the family incident. She, however, observed precisely the same peculiarity in her husband, but his nose, from not being particularly prominent, has never as yet suffered from the blows. The trick does not occur when he is half-asleep, as, for example, when dozing in his arm-chair, but the moment he is fast asleep it is apt to begin. It is, as with his father, intermittent sometimes ceasing for many nights, and sometimes almost incessant during a part of every night. It is performed, as it was by his father, with his right hand.

"One of his children, a girl, has inherited the same trick. She performs it, likewise, with the right hand, but in a slightly modified form; for, after raising the arm, she does not allow the wrist to drop upon the bridge of the nose, but the palm of the half-closed hand falls over and down the nose, striking it rather rapidly. It is also very intermittent with this child, not occurring for periods of some months, but sometimes occurring almost incessantly."

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assured by a gentleman on whom I can rely, to clear their throats; but here habit probably comes into play, as we clear our own throats under similar circumstances. I have also been told that at leaping matches, as the performer makes his spring, many of the spectators, generally men and boys, move their feet; but here again habit probably comes into play, for it is very doubtful whether women would thus act.

Refer actions.—Reflex actions, in the strict sense of the term, are due to the excitement of a peripheral nerve, which transmits its influence to certain nerve-cells, and these in their turn excite certain muscles or glands into action; and all this may take place without any sensation or consciousness on our part, though often thus accompanied. As many reflex actions are highly expressive, the subject must here be noticed at some little length. We shall also see that some of them graduate into, and can hardly be distinguished from actions which have arisen through habit.[9] Coughing and sneezing are familiar instances of reflex actions. With infants the first act of respiration is often a sneeze, although this requires the co-ordinated movement of numerous muscles. Respiration is partly voluntary, but mainly reflex, and is performed in the most natural and best manner without the interference of the will. A vast number of complex movements are reflex. As good an instance as can be given is the often-quoted one of a decapitated frog, which cannot of course feel, and cannot

[9] Prof Huxley remarks ('Elementary Physiology,' 5th edit. p. 305) that reflex actions proper to the spinal cord are natural. but, by the help of the brain, that is through habit, an infinity of *artificial* reflex actions may be acquired. Virchow admits ('Sammlung wissenschaft. Vorträge,' &c., "Ueber das Rückenmark," 1871, ss. 24, 31) that some reflex actions can hardly be distinguished from instincts; and, of the latter, it may be added, some cannot be distinguished from inherited habits.

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consciously perform, any movement. Yet if a drop of acid be placed on the lower surface of the thigh of a frog in this state, it will rub off the drop with the upper surface of the foot of the same leg. If this foot be cut off, it cannot thus act. " After some fruitless efforts, therefore, it gives up trying in that way, seems restless, as though, says Pfluger, it was seeking some other way, and at last it makes use of the foot of the other leg and succeeds in rubbing off the acid. Notably we have here not merely contractions of muscles, but combined and

harmonized contractions in due sequence for a special purpose. These are actions that have all the appearance of being guided by intelligence and instigated by will in an animal, the recognized organ of whose intelligence and will has been removed.''[10]

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[10] Dr. Maudsley, 'Body and Mind,' 1870, p. 8.

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Associated habitual movements in the lower animals.—I have already given in the case of Man several instances of movements associated with various states of the mind or body, which are now purposeless, but which were originally of use, and are still of use under certain circumstances. As this subject is very important for us, I will here give a considerable number of analogous facts, with reference to animals; although many of them are of a very trifling nature. My object is to show that certain movements were originally performed for a definite end, and that, under nearly the same circumstances, they are still pertinaciously performed through habit when not of the least use. That the tendency in most of the following cases is inherited, we may infer from such actions being performed in the same manner by all the individuals, young and old, of the same species. We shall also see that they are excited by the most diversified, often circuitous, and sometimes mistaken associations.

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Many carnivorous animals, as they crawl towards their prey and prepare to rush or spring on it,. lower their heads and crouch, partly, as it would appear, to hide themselves, and partly to get ready for their rush; and this habit in an exaggerated form has become hereditary in our pointers and setters. Now I have noticed scores of times that when two strange dogs meet on an open road, the one which first sees the other, though at the distance of one or two hundred yards, after the first glance always lowers its head, generally crouches a little, or even lies down; that is, he takes the proper attitude for concealing himself and for making a rush or spring, although the road is quite open and the distance great. Again, dogs of

all kinds when intently watching and slowly approaching their prey, frequently keep one of their fore-legs doubled up for a long time, ready for the next cautious step; and this is eminently characteristic of the pointer. But from habit they behave in exactly the same manner whenever their attention is aroused (fig. 4). I have seen a dog at the foot of a high wall, listening attentively to a sound on the opposite side, with one leg doubled up;

Fig. 4. Small dog watching a cat on a table. From a photograph taken by Mr. Rejlander.

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and in this case there could have been no intention of making a cautious approach.

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Horses scratch themselves by nibbling those parts of their bodies which they can reach with their teeth; but more commonly one horse shows another where he wants to be scratched, and they then nibble each other. A friend whose attention I had called to the subject, observed that when he rubbed his horse's neck, the animal protruded his head, uncovered his teeth, and moved his jaws, exactly as if nibbling another horse's neck, for he could never have nibbled his own neck. If a horse is much tickled, as when curry-combed, his wish to bite something becomes so intolerably strong, that he will clatter his teeth together, and though not vicious, bite his groom. At the same time from habit he closely depresses his ears, so as to protect them from being bitten, as if he were fighting with another horse.

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Kittens, puppies, young pigs and probably many other young animals, alternately push with their forefeet against the mammary glands of their mothers, to excite a freer secretion of milk, or to make it flow. Now it is very common with young cats, and not at all rare with old cats of the common and Persian breeds (believed by some naturalists to be specifically extinct), when comfortably lying on a warm shawl or other soft substance, to pound it quietly and alternately with their fore-feet; their toes being spread out and claws slightly protruded, precisely as when sucking their mother. That it is the same movement is clearly shown by their often at the same time taking a bit of

[16] Dr. Darwin, 'Zoonomia,' 1794, vol. i. p. 160. I find that the fact of cats protruding their feet when pleased is also noticed (p. 151) in this work.

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the shawl into their mouths and sucking it; generally closing their eyes and purring from delight. This curious movement is commonly excited only in association with the sensation of a warm soft surface; but I have seen an old cat, when pleased by having its back scratched, pounding the air with its feet in the same manner; so that this action has almost become the expression of a pleasurable sensation.

Having referred to the act of sucking, I may add that this complex movement, as well as the alternate protrusion of the fore-feet, are reflex actions; for they are performed if a finger moistened with milk is placed in the mouth of a puppy, the front part of whose brain has been removed.[17] It has recently been stated in France, that the action of sucking is excited solely through the sense of smell, so that if the olfactory nerves of a puppy are destroyed, it never sucks. In like manner the wonderful power which a chicken possesses only a few hours after being hatched, of picking up small particles of food, seems to be started into action through the sense of hearing; for with chickens hatched by artificial heat, a good observer found that " making a noise with the finger-nail against a board, in imitation of the hen-mother, first taught them to peck at their meat."[18]

I will give only one other instance of an habitual and purposeless movement. The Sheldrake (*Tadorna*) feeds on the sands left

uncovered by the tide, and when a worm-cast is discovered, " it begins patting the ground with its feet, dancing as it were, over the hole; " and this makes the worm come to the surface. Now Mr. St. John says, that when his tame Sheldrakes

[17] Carpenter, 'Principles of Comparative Physiology,' 1854, p. 690, and Müller's 'Elements of Physiology,' Eng. translat. vol. ii. p. 936.

[18] Mowbray on 'Poultry,' 6th edit. 1830, p. 54.

"came to ask for food, they patted the ground in an impatient and rapid manner."[19] This therefore may almost be considered as their expression of hunger. Mr. Bartlett informs me that the Flamingo and the Kagu (*Rhinochetus jubatus*) when anxious to be fed, beat the ground with their feet in the same odd manner. So again Kingfishers, when they catch a fish, always beat it until it is killed; and in the Zoological Gardens they always beat the raw meat, with which they are sometimes fed before devouring it.

We have now, I think, sufficiently shown the truth of our first Principle, namely, that when any sensation, desire, dislike, &c., has led during a long series of generations to some voluntary movement, then a tendency to the performance of a similar movement will almost certainly be excited, whenever the same, or any analogous or associated sensation &c., although very weak, is experienced; notwithstanding that the movement in this case may not be of the least use. Such habitual movements are often, or generally inherited; and they then differ but little from reflex actions. When we treat of the special expressions of man, the latter part of our first Principle, as given at the commencement of this chapter, will be seen to hold good; namely, that when movements, associated through habit with certain states of the mind, are partially repressed by the will, the strictly involuntary muscles, as well as those which are least under the separate control of the will, are liable still to act; and their action is often highly expressive, Conversely, when the will is temporarily or permanently weakened, the voluntary muscles

[19] See the account given by this excellent observer in 'Wild Sports of the Highlands,' 1846, p. 142.

fail before the involuntary. It is a fact familiar to pathologists, as Sir C. Bell remarks,[20] "that when debility arises from affection of the brain, the influence is greatest on those muscles which are, in their natural condition, most under the command of the will." We shall, also, in our future chapters, consider another proposition included in our first Principle; namely, that the checking of one habitual movement sometimes requires other slight movements; these latter serving as a means of expression.

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[20] 'Philosophical Transactions,' 1823, p. 182.