

## NEW PUBLICATIONS.

## DARWIN ON EXPRESSION.

THE EXPRESSION OF THE EMOTIONS IN MAN AND BEAST. BY CHARLES DARWIN, F.R.S. AND J. H. SPENCER, ESQ.

The scientific exposition of the subject to which the present volume is devoted was first given to the world in the celebrated "Origin of Species," in the "Anatomy and Physiology of Expression," published in 1868 and subsequently in 1864. His treatise, according to Mr. Darwin, is one of great value and importance, abounding in graphic descriptions of the emotions, with admirable illustrations, and fully establishing the intimate relation between the anatomy and expression and the emotions. He did not attempt, however, to carry out his views to their full extent. He does not explain why different muscles are brought into action under different emotions—why, for instance, the inner ends of the eyebrows are raised, and the corners of the mouth depressed by a person suffering from grief or anxiety. Different writers have since treated the subject with more or less completeness and accuracy, especially Mr. Herbert Spencer, who, in the opinion of Mr. Darwin, has suggested the true theory of a large number of expressions in seeing the fact that the external signs of passion are the consequences of the necessary voluntary movements that must ensue in the structure of the human body. The palpitations and tremblings that are called forth by intense fear, for example, are the signs that would accompany an actual experience of the evil feared. The destructive passions, in general, are manifested by the same acts that accompany the killing of prey, as the activity of the muscular system, the raising of the teeth and the protrusion of the claws, the mien growl and the dilated eyes and nostrils.

With the exception of Herbert Spencer, the writers on expression have taken it for granted that the various species of the animal kingdom, including man, have come into existence in their present condition. Thus, for example, it is assumed that many of our facial muscles are a special provision for the purpose of expression. But, against Mr. Darwin, the fact that the anthropoid apes possess the same facial muscles as man, makes it improbable that these muscles in our case serve exclusively for that purpose. No one can believe that man has been endowed with special muscles solely for the purpose of expression. Nature, indeed, can be assigned for almost all the facial muscles, with no reference to expression. But the belief that man alone existed in a lower condition, explains many forms of expression, such as the bristling of the hair in extreme terror, or the uncovering of the teeth in furious rage. These could hardly be accounted for on any other theory. The proximity of the emotions to the instinct, the allied species, as in the movements of the same facial muscles during laughter by man and by various monkeys, is rendered intelligible by the supposition of their descent from a common progenitor. The doctrine of evolution, in fact, places the whole subject in a new and interesting light.

In unfolding the philosophy of expression, Mr. Darwin makes use of three principles which, in his view account for most of the acts and gestures exhibited by man and the lower animals under the influence of various emotions and sensations. First, the principle of servicable associated habits. Certain actions are of service under certain states of mind in order to relieve or gratify certain sensations or desires. Whenever the same state of mind is induced, the force of habit, or association, leads to the performance of the same movements, although they may then not be of the least use. Second, the principle of antithesis. Certain states of the mind, as indicated under the first principle, lead to certain habitual actions, which are of service. But when a directly opposite state of mind is induced, there is a tendency to the performance of movements of a directly opposite nature, although these are of no use. Such movements are some, however, are highly curious. Third, the principle of actions due to the constitution of the nervous system.

The first principle is illustrated by the well-known force of habit. The most difficult movements come in time to be performed without the slightest effort or consciousness. Actions, sensations, and modes of feeling which occur together, or in close succession, induce in such a way that when one of them is induced to the mind, the others are brought up in time. There are some actions commonly performed which obtain certain circumstances that seem to be the initiation or sympathy. Thus persons cutting another with a pair of scissors may be seen to move their jaws simultaneously with the blades of the scissors. In learning to write, children often twist about their tongues as their fingers move in a trifling fashion. When a stranger in public suddenly

becomes a little hoarse, many of those present will be heard to clear their throats. As long as matches are the performer makes his spring, many of the spectators move their feet.

There are also other actions, which take place without any sensation or consciousness on our part. Some of these can scarcely be distinguished from habitual actions. Coughing and sneezing are familiar instances of this kind. Respiration is partly voluntary, but mainly reflex, and is performed without the intervention of the will. A vast number of complex movements are reflex. If a drop of acid be placed on the lower surface of the thigh of a doctored frog, it will rub off the drop with the upper lip, or the familiar instance of the reflex action is the involuntary closing of the eyelids when the surface of the eye is touched—A similar winking movement is caused when a blow is directed towards the face. "I may mention a trifling fact," says Mr. Darwin. "Illustrating this kind, and which is not less curious. I was sitting at a table with the glass plate in front of a paddle in the Zoological Garden, with the firm determination of not starting back if the snake struck at me; but, as soon as the blow was struck, my resolution went for nothing, and I jumped a yard or two backward with astonishing rapidity. My will and reason were powerless against the impulsion of the snake's tongue. My expression of indignation. The violence of a start seems to depend partly on the vivacity of the imagination, and partly on the condition of the nervous system.

The lower animals present an abundance of curious movements, which were originally of use, but are now purposeless. The dog that wishes to go to sleep on the carpet turns round and round, smothering with his forepaws in a scoldish manner, as if he intended to tear down the grass and sweep away the dirt, was done by his will, associations when they lived on grassy plains, or in the woods. Jackals, and other animals of the kind in the Zoological Garden treat their straw in the same manner. Many carnivorous animals, as they crawl towards their prey, lower their heads, partly, as it would appear, to hide themselves, and partly to get ready for the attack. This habit becomes hereditary in pecking and setting traps. When two strange dogs meet in an open road, the one which first sees the other lowers his head, begins to crouch, and perhaps lies down. This is to take the attitude for concealing himself and for making a run or spring, although the road is quite open, and the distance great. Dogs of all kinds, when walking their prey, often keep one of their fore legs doubled up for a long time, as if to get ready for the next easiest step. Dogs and jackals take much pleasure in jolting and rubbing their necks and backs on carmen. This is not the case with wolves. The larger dogs, which are probably descended from wolves, do not like to roll in carmen so much as the smaller dogs which are probably descended from jackals. A little dog, when walking to the anthracite, when a piece of biscuit is offered to her, will bow its chest and waver it, as if it were a rat; she then rolls on it as if it were a piece of carmen, and at last eats it. It would appear that a hungry relief has to be given to the distasteful morsel. The same dog acts in the same way after killing a bird or mouse. Dogs scratch themselves by a rapid movement of one of their hind legs. Beavers scratch themselves when they are rubbed with a stick, they cannot help scratching the air or the ground in a ludicrous manner. Beavers scratch themselves by nibbling their

parts of their bodies which they can reach with their teeth, but more commonly one haw shows another where he wants to be scratched, and they then nibble each other. It has been observed that when a horse's head was rubbed, he protruded his head, uncovered his teeth, and moved his jaws as if nibbling another horse's neck. When a horse is carried, his wish to bite often becomes so strong that he will dash his teeth through an iron ring. He will also bite his feet. Cats, as is well known, dislike wetting their feet, owing, Mr. Darwin suggests, to their having originally inhabited the dry country of Egypt, and when they wet their feet, they shake them violently. When some water was poured into a glass close to the head of a kitten, it immediately shook its feet in the usual manner, showing an instance of an habitual movement being excited by an associated idea. Another example of an habitual movement without purpose is furnished by the sheldrake. The wild bird feeds on the seeds left uncovered by the tide, and when a worm-hole is discovered peeps the ground with its feet which make the worm come to the surface. Now the tame sheldrake has been noticed when they come to seek for food, to peck the ground in a rapid and impatient

manner, making the movement their expression of hunger. The sheldrake and other birds when anxious to be fed beat the ground with their feet in the same odd manner. The kingfisher when they catch a fish always makes it in the habit of striking the water in the Zoológico Garden always beat the ground with which they are sometimes fed before devouring it.

Now, as we have seen that certain states of the mind lead to certain habitual movements which were originally of service, but are now without purpose it is also true that, when a directly opposite state of mind is induced, there is a tendency to the performance of movements of a directly opposite kind, though they have never been of any service. When a dog, for example, approaches a strange dog or a man in a hostile frame of mind, he walks upright and very stiffly. His head is raised, and the tail is held erect and quite rigid. The hair bristles, the pupils are dilated, the ears are drawn forward, and he has a fixed stare. As he proceeds to spring with a savage growl at his enemy, the canine teeth are uncovered, and the ears are pressed backward on the head. But let us now suppose that the dog suddenly discovers that the man whom he is about to attack is not a stranger, but his master. His tail is wagged, he immediately resumes his usual mode of walking upright, the body crouches, and is thrown into flexuous movements. His tail is lowered, and wags from side to side. His hair at once becomes smooth. His ears are depressed and drawn backward, but not closely to the head. His lips hang loosely. The eyelids become elongated from the drawing back of the ears, and the eyes no longer appear inclined to fight. The stare is gone, and there is in an excited condition from fear, and nervousness is generated in excess, which naturally leads to some kind of action. None of the movements described, so clearly expressive of affection, are of the least direct service to the animal. Their explanation is to be found in the fact that they are in complete antithesis to the movements which were originally of service in order to fight, which consequently are expressions of anger. "I will here give," says the author, "one other instance of antithesis in expression. I formerly possessed a large dog, who, like every other dog, was much pleased to go out walking. He showed his pleasure by trotting gravely before me with high steps, head much raised, moderately quick movements, and tail curled and not stiff. Now far from it, he became a path breaker off to the right, leading to the hot-house, which I used often to visit for a few moments, to look at my experimental plants. This was always a great disappointment to the dog, as he did not know whether I should continue my walk; and the instantaneous and complete change of expression, which came over him, as soon as my body arrived in the house towards the hot-house, sometimes tried this as an experiment was laughable. His look of dejection was known to every member of the family, and was called his hot-house face. This consisted in the head drooping much, the whole body sinking a little and remaining motionless; the ears and tail falling suddenly down, but the tail was by no means wagged. With the falling of the ears and of his head, however, the eyes became much changed in appearance, and I fancied that they looked less bright. His aspect was that of pitious, hopeless dejection; and it was, as I have said, laughable, as the cause was so slight. Every detail in his attitude was in complete opposition to his former joyful yet dignified bearing; and can be explained, as it appears to me, in no other way, except through the principle of antithesis. I should have attributed it to his lowered spirits attending, as in the case of man, the nervous system and circulation, and consequently the tone of his whole muscular frame; and this may have been in part the cause."

In the explanation of the third principle, namely, that many expressions of certain states of mind result from the constitution of the nervous system, Mr. Darwin refers to the loss of color in the hair which is sometimes the consequence of extreme terror or grief. Another instance is that of the trembling of the muscles, which is common to man and the lower animals. This is of no service, often of great inconvenience, and cannot have been at first supplied by association with any emotion. Young children do not tremble, but go into convulsions under the circumstances that would induce excessive trembling in adults. Trembling is caused not only by fear, but occasionally also by anger and joy. Mr. Darwin remembers once seeing a boy who had just shot his first snipe on the wing, whose hands trembled so much as to drop the snipe from his hands. The music often causes a shiver to run down the backs of some sensitive persons. When animals suffer from an agony of pain, they generally writhe about with frightful contortions. These which habitually use their voices often utter cries or groans. Almost every animal of the body is brought into strong action.

William, the mouth being, as usually supposed, with commonly the lips are relaxed, with the best finished or ground together. The eyes stare wildly, or the brows are heavily contracted. Perspiration beads the body, and drops trickle down the face. The nostrils are widely dilated, and the nostrils, and the breath may be held until the blood stagnates in the purple face.

One of the most striking chapters in the volume is devoted to an analysis of the phenomena of blushing. This is the most peculiar and the most human of all expressions. Monkeys reddens from passion, but no evidence could be obtained by any animal dissection. The face is reddened in the exhibition of the muscular coats of the small arteries by which the capillaries become filled with blood. We cannot cause a blush, as we can laughing, weeping, or doubting, by any physical means, any action on the body. It is the mind which must be affected. Smiling is not only involuntary, but the wish to restrain it, by leading to self-contradiction, increases the tendency. The young blush more freely than the old, but not during infancy, although infants at a very early age reddens from passion. Infants rarely blush. Women blush much more than men. Old men seldom blush, not so when old women. The child do not weep. The tendency to blushing increases in a man as he grows older, and the weeping of a father, mother, and son children, all of whom were prone to blush to a most painful degree. Nothing was of the slightest avail to break the children of this involuntary habit. Even peculiarities in blushing seem to be hereditary. A surgeon was struck with the singular manner of blushing of a young woman under his care. A big splash of red appeared on one cheek, and another smaller splash, variously colored over the face and neck. Upon asking the mother whether her daughter always blushed in this peculiar manner, she answered, "Yes, she takes after me!" The question turned the mother to blush and she exhibited the same peculiarity as her daughter. In most cases, the face, ears, and neck are the sole parts which redden. In some persons while blushing the whole of the body grows hot and tingles, showing that the entire surface must be affected in the same manner. Blushes are sometimes said to commence on the forehead, but more commonly on the cheeks, afterward spreading to the ears and nose. Blushing is seen in all the Aryan nations of Europe, and to a certain extent with those of India. The Nordic races blush freely, the Chinese seldom. You may often see a blush on the cheeks of the fairest Polynesian women, and of the young women among the American Indians. Negroes possess an appearance resembling a blush, described by some observers as blushing leprosy, while most affirm that the blushing becomes more intense. The condition of the mental powers which most persons experience while blushing deeply is admirably illustrated by the author.

Persons in this condition lose their presence of mind, and stare stupidly inopportune remarks. They make often much distressing statements, and make a great many movements as though extremely. In certain cases involuntary writhings of some of the facial muscles may be observed. I have been informed by a young lady who was present, that at such times she does not even know what she is saying. When it was explained to her that this might be due to her distress from the consciousness that her blushing was noticed, she answered that this could not be, as she was engaged to be quite as stupid when blushing at a thought in her own view.

I will give an instance of the extreme disturbance of the eye which some sensitive men are liable. A gentleman on whom I had just referred one that he had been an eye-witness of the following case: A small German was given in lecture, and an extremely shy man, who, when he rose to return thanks, released the speech which he had evidently learnt by heart, in absence of eyes, and did not utter a single word; but he acted as if he were speaking with much emphasis. His friends, who saw and saw the speaker, readily perceived the involuntary nature of the speech, and the man never discovered that he had released the words thus incoherently. On the contrary, he afterward remarked to my friend, with much astonishment, that he thought he had succeeded excessively well.

When a person is much ashamed or very shy, and blushes intensely, his heart beats rapidly and his veins in the face are dilated. This can be seen by the circulation of the blood within the veins, and perhaps the essential point. It seems, however, desirable, because from the still more powerful influence of anger and fear on the heart, the blood is sent with a rapidity which accounts for the confused state of mind in persons who blush highly.

The fine capillaries apparently lie in the ultimate sympathy which exists between the capillary circulation of the brain and face, and that of the body. On applying to Dr. J. Crocker Brown for information, he has given me various facts bearing on this subject. When the sympathetic nerves is divided on one side of the head, the capillaries on this side are arrested and become filled with blood, causing the skin to redden and to grow hot, and at the same time the temperature within the cranium on the same side rises. In connection with the structures of the brain leads to the engagement of the face, ears, and eyes with blood. The first stage of an epileptic fit appears to be a constriction of the vessels of the brain, and the first outward manifestation is an extreme pallor of countenance. A portion of the head commonly indicates delirium. Even the point given to a severe headache by burning the skin with strong lotion, depends, I presume, on the same principle.

Dr. Brown has often administered to his patients the vapor of ether, which, when applied to the face, has the property of causing very redness of the face in twenty minutes to nearly an hour. This exciting reaction blushing is almost every detail of which at several distinct points on the face, and especially if it involves the nasal surface of the head, neck, and front of the chest, but has been observed to extend only on one side to the abdomen. The arteries in the retina become enlarged; the eye grows, and in one instance there was a slight effusion of tears. The patients are at first pleasantly stimulated, but as the blushing progresses, they become confused and bewildered. One woman to whom the vapor

of ether was administered, the face grew hot, the eyes were inflamed, with severe pain resulting in double vision, and the patient became so excited and lively because, that their mental powers are somewhat stimulated. It is only when the blushing is so intense that the mind grows dull, and the patient would seem that the capillaries of the face are affected, but the dilated and often contracted state of the arteries during blushing, before this part of the brain is affected.

When the face and brain is primarily affected, the circulation of the skin is so in a secondary manner. Dr. Brown has frequently observed that the capillaries of the nostrils and nostrils and nostrils on the cheeks of epileptic patients, in some cases, are filled with blood, or that of a color or abundance, is greatly increased, or in other respects, is in a secondary manner, is merely increased, but the capillaries of the nostrils and nostrils on the face and neck are not affected. These are the several vessels of the face, and they indicate, as Dr. Brown remarks, a highly modified, but a secondary, nervous vascular system. If, then, these vessels, as Dr. Brown remarks, are in a secondary manner, a secondary vascular system is in part of the brain which, in some cases, depends, as in the skin of the face, it is not possible that the mind should be affected, and blushing should likewise induce, independently of their own direct influence, which is confined to the face.

The exposition in this volume is to a great degree independent of the peculiar speculations of Mr. Darwin in regard to the origin of species. His occasional references to their bearing on the subject will probably be regarded as more ingenious than necessary. The fact that all the chief expressions exhibited by the races are the same throughout the world, he considers an evidence of the descent of the several races from a single parent-stock, which must have been almost completely human in structure, and to a large extent, in mind, before the period at which the races diverged from each other, similar structures, adapted for the same purpose, he believes, are often, but independently acquired by distinct species, but this view will not explain the close similarity between distinct species in a multitude of unimportant details. It seems improbable that such identity of structure could have been acquired by independent means. But this must have been the case if the races of man are descended from several distinct ancestral species. It is far more credible that the several points of similarity in the various races are due to inheritance from a single parent-form which had already assumed a human character.

The question arises at how early a period is the long line of our progenitors, the various arrangements of expression, now exhibited by man were successively acquired. We may believe, according to Mr. Darwin, that laughter, as a sign of pleasure, was possessed by our progenitors long before they acquired definitely human characteristics. For many kinds of monkeys, when pleased, utter a succession of sounds, similar to our laughter, often accompanied by the wrinkling of the cheeks, and even by the brightening of the eye. Fear was also probably expressed from an extremely remote period by trembling, the erection of the hair, cold perspiration, pallor, and the covering of the whole body, in almost the same manner as it now is by man. Suffering from the first, will have caused the utterance of screams and groans, the grinding of the teeth, and the contortion of the body. Weeping probably came on rather late in the line of descent, which conclusion agrees with the fact, that our nearest allies, the anthropoid apes, do not weep. Our early progenitors, when suffering from grief or anxiety, would not have made their eyebrows oblique, or have drawn down the corners of their mouths, until they had acquired the habit of restraining their screams. The expression of grief and anxiety, therefore, is eminently human. Rage will have been expressed at a very early period by frantic gestures, by glaring eyes, and the reddening of the skin, but not by frowning. Our primal ancestors when enraged would probably have exposed their teeth more freely than is done by man. We may be almost certain that they were, however, provoked their lips, when angry or disappointed, in a greater degree than is the case with our own children, or even with the children of existing savage races. When angry, they would not have held their heads erect, opened their chests, and squared their shoulders, until they had acquired the upright attitude of man, and had learned to fight with their fists or clubs. Of all expressions, blushing seems to be the most strictly human. It is common to nearly all the races of man, whether or not any change of color is visible in their skin. But the relaxation of the small arteries of the surface on which blushing depends, seems to have resulted at first from earnest attention to the appearance of our own persons, and afterward extended by the power of association, to all other persons. It can hardly be doubted that many animals possessed beautiful colors, and even beautiful forms, but it does not seem possible that any animal, until the mental powers had been developed to an equal degree with those of man, could have been sensitive about its own personal appearance. We may hence conclude that blushing originated at a very late period in the long line of our descent. It will be perceived from the amount which we have given of a portion of the contents of this valuable volume that it possesses a greater degree of popular interest than most of the previous writings of the author. It embodies the results of profound research in a singularly fascinating form. Without the rigid methods of science, it combines scientific accuracy

with agreeable illustration. It brings an immense store of facts to the exposition of a most attractive branch of natural history. The manner of the author is so remarkable for its clarity

as for its perspicuity. Not a trace of pedantry or of pretension can be found in his candid pages. His mode of thinking is so free and untrammelled than his style. He always challenges the sympathy of his readers, even when he does not demand their convictions. His reasoning produces a strong impression of the essential points of the highest specimens of the English mind. The charm of his expatiations arises a deep personal interest, like that which is called forth by the utterly sincere teachings of his eminent countryman, Professor Tyndall. His speculations on the origin of man, we are unwilling to assert, with our present lights, but we rejoice to do honor to his description of the phenomena of living nature, which are as delightful as they are original and instructive.