LITERARY.

MR DARWIN ON THE EXPRESSION OF THE EMOTIONS.

The Expression of the Emotions in Man and Animals. By Charles Darwin, M.A., F.R.S, &c. Murray.

(*First Notice.*)

This last work of the author of 'The Origin of Species' displays in a very high degree the qualities of his former books, an extraordinary range of knowledge, felicity of style, and a happy, if occasionally somewhat bold, spirit of speculation. Its subject, however, lies a little off the main line of march. His treatises on the fertilisation of orchids, the descent of man, and domesticated plants and animals, were parts of one great argument, of which the theme was the origin of species. In the present volume Mr Darwin does not claim too much: he says that "the study of the theory of expression confirms to a certain limited extent the conclusion that man is derived from some lower animal form, and supports the belief of the specific or sub-specific unity of the several races; but, as far as my judgment serves, such confirmation was hardly needed." The general doctrine of development may help to elucidate the obscure and complicated subject of expression, but it really cannot derive much support from it, on account of the number of rival explanations. Mr Darwin, assuming development as a fact, inquires whether it can throw any light on the origin of the different modes of expressing the different passions of the soul. It is not a new subject to him, for his notes go so far back as 1838, and for many years he has kept it in view and been adding to his stock of observations. He has thus given, apart from any question as to the value of his general theory, the most important contribution to the theory of expression that has yet been published.

Six years after Mr Darwin began making notes on the expression of the emotions, Sir Charles Bell produced the third edition of his famous work on the 'Anatomy and Philosophy of Expression,' of which Mr Darwin speaks in terms of warm and generous praise. "He may with justice be said, not only to have laid the foundations of the subject, but to have built up a noble structure." He showed by what different muscles of the face the different expressions are produced, and also the intimate relation that exists between the movements of expression and those of respiration: but there he halted; he did not examine "why different muscles are brought into action under different emotions." Sir Charles Bell stopped short at the facts, without attempting any philosophical explanation. He was a believer in design, and in the separate creation of species, and the only solution open to him was the jejune one, "so it was intended for wise purposes." Mr Darwin begins where Sir Charles Bell ended, and, in addition to ascertaining by wider observation the exact truth in regard to expressions, has endeavoured, not, as it seems, without success, to explain the facts by the theory of descent, with which his name is so indissolubly connected.

We are all familiar with the language of emotion, and can read in the human face the signs of the various feelings, but few are able to specify distinctly what those signs are. To determine with precision what the facts are, is, therefore, no easy task, and Mr Darwin has resorted to various methods of ascertaining them. He has himself closely watched the early days of his own children, and his observations form one of the most valuable portions of his book. The insane often give free vent to their passions, and afford a capital opportunity for observing the characteristics of expression. By galvanism Dr Duchenne has succeeded in producing certain expressions artificially, and some of his instructive photographs are given in the present volume. But one of the most interesting series of observations was instituted by means of a series of questions, covering all the leading expressions, which was sent to observers in every part of the globe. Thirty-six sets of answers were returned, and these are most valuable in determining the universality of certain expressions among the different races of men. Lastly, Mr Darwin made a study of the expression of emotions by the lower animals, and especially by those that come nearest to man.

With the observations gathered in these different ways, Mr Darwin proceeds to ask why, for example, contempt is expressed "by a slight protrusion of the lips and by turning up the nose, with a slight expiration," or why "children when sulky, pout or greatly protrude the lips." He admits that for some of the facts he can at present give no explanation, but he thinks that most of them are explained by one or other of three principles. Of his three principles we shall at present advert only to the first, which has also the most direct bearing on his theory of development. Many expressions of emotion are simply the rudimentary remains of actions that were once prompted by the emotion and directed for the benefit of the animal. An indignant man plants himself in an attitude for fighting, and the expression of anger consists of the pugnacious movements on a reduced scale. This principle is entirely in accordance with the teaching of psychology. Useful movements performed at the instigation of a feeling will continue to be repeated even when useless, by the mere force of association. The history of human institutions—surviving their usefulness—is one long continued illustration. The remarkable fact of "symbolism," admirably explained in Mr McLennan's work on 'Primitive Marriage,' shows that the form of a custom is very often kept up most reverentially, when the substance thereof has become unendurable. Roman fathers went through the formality of selling their daughters for centuries probably after the transaction had really ceased to be of the nature of a sale; and the form of capture in marriage has survived among the most civilised nations, although the original reality is only to be found among very backward races. An example of the same principle, in a very different application, may be quoted:

> Kittens, puppies, young pigs, and probably many other young animals, alternately push with their fore-feet against the mammary glands of their mothers, to excite a free 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 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 with 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.

This is one example out of many given in Mr Darwin's book, the only difficulty being to decide which ought to be selected. One of the most interesting cases to which Mr Darwin has applied his first principle is to the expression of grief. This expression is thus described in the questions prepared for foreign observers:

> When in low spirits, are the corners of the mouth depressed, and the inner corner of the eyebrows raised by that muscle which the French call the "grief muscle?" The eyebrow in this state becomes slightly oblique, with a little swelling at the inner end; and the forehead is transversely wrinkled in the middle part, but not across the whole breadth, as when the eyebrows are raised in surprise.

The photographs in this book make this expression much clearer than any description, but the characteristic mark—a peculiar wrinkle in the brow—is easily understood. Connected with this mark is the peculiar obliquity of the eyebrows. Whence those movements in grief? The explanation is very interesting.

> When infants scream loudly from hunger or pain, the circulation is affected, and the eyes tend to become gorged with blood: consequently the muscles surrounding the eyes are strongly contracted as a protection; this action, in the course of many generations, has become firmly fixed and inherited; but when, with advancing years and culture, the habit of screaming is partially repressed, the muscles round the eyes still tend to contract whenever even slight distress is felt; of these muscles, the pyramidals of the nose are less under the control of the will than are the others, and their contraction can be checked only by that of the central fasciæ of the frontal bone; these latter fasciæ draw up the inner ends of the eyebrows, and wrinkle the forehead in a peculiar manner, which we instantly recognise as the expression of grief or anxiety. Slight movements, such as these just described, or the scarcely perceptible drawing down of the corners of the mouth, are the last remnants or rudiments of strongly marked and intelligible movements. They are as full of signifi-

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cance to us in regard to expression as are ordinary rudiments to the naturalist in the classification and genealogy of organic beings.

Mr Darwin's remarks on "frowning" are equally instructive. He agrees with Mr Herbert Spencer that one of the causes of frowning is to screen the eyes, but he gives this a wider extension. Mr Darwin considers that the habit of half closing the eyes is in incessant use among wild men, who are constantly on the alert against possible danger, and he observes that a frown occurs not only in anger, but whenever the mind comes across any difficulty requiring its close attention. Mr Darwin adds, however, another cause connected with the weeping of infants. A frown is an incipient act of weeping, and "as the habit of contracting the brows has been followed by infants during innumerable generations, at the commencement of every crying or screaming fit, it has become firmly associated with the incipient sense of something distressing or disagreeable."

The expression of disgust, which is simply an incipient act of vomiting, gives occasion to an ingenious guess of Mr Darwin's. He thinks that our progenitors may have had the power, possessed by ruminants and some other animals, "of voluntarily rejecting food which disagreed with them, or which they thought would disagree with them." Monkeys seem to have this power, for they often vomit when in perfect health. When man acquired speech, and could tell his children what to take and what to shun, the serviceableness of the power of ejection was diminished, and it would accordingly be disused and lost. Whether it was so or not, the suggestion is worth the notice of naturalists, and may help to explain other facts besides those of expression.

One of the most curious things in the present volume, if true, is of much importance. Since the time of Berkeley, there has been a general agreement that the perception of distance is acquired by each individual; but recently several writers have strongly argued for the instinctive knowledge of space, and have laid the main stress of their argument on observations of the lower animals. Professor Bain has argued that our knowledge of animals is too imperfect to support any objection to Berkeley's famous theory of vision; and, if what Mr Darwin says proves correct, the soundness of his contention will receive strong confirmation. "It has recently," says Mr Darwin, "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 a finger-nail against a board, in imitation of the hen-mother, first taught them to peck at their meat."

THE MOHAMMEDAN EAST.

Essays on Eastern Questions. By W. G. Palgrave. Macmillan.

Profound distinction between the Mohammedan rule and the Mohammedan spirit—between "Stamboollee"-ism with its French varnish and "a weathercock for its banner," and Islam, with its antagonism to Europe, its stubborn life, and latent enthusiastic fire—such is the fact, or phantasy, whose announcement characterises this book, and constitutes the author's claim to an attentive audience. Mr Palgrave, of course, admits truth in the hearsay epithet, "sick man." "Constantinople is sick, and the Ottoman Empire is sick;" but the gist of the book is that both are, in scholastic nomenclature, only separable accidents of the central figure in the Mohammedan East—Islam, at whose "funeral," it is suggested, we need be in no particular hurry to assist.

Mr Palgrave is one of the few writers on Oriental politics who have a right to be thoroughly studied, not least, perhaps, by readers who may choose to differ from him. No one can question his power of description, general gift of expression, varied culture, and capacity of sympathy; and if these indispensable attributes happen to be conjoined with freedom from bias, this volume of essays must be pronounced to be a most important contribution to a species of literature which, in addition to its own direct value, possesses an indirect one—for those, namely, who study their own "politics" and social questions by aid of the experience derived from the history of the general movements of human society. To take an instance of rapidly growing importance: Islam, Brahmoism, Buddhism, throw a strong —if to many, an unwelcome—light on the course of our own Christianity. Extension of one's field of vision in the way thus hinted at might be found to possess an advantage similar to that of a merging of beadledom politics in statesmanship.

To demonstrate the antagonism between the Ottoman Empire and Islam, Mr Palgrave begins by analysing the characteristics of each of the dozen or so classes into which he divides the Asiatic subjects of the Porte. First come the members of the Civil Service, whom our author contemptuously typifies by the ordinary "Stamboollee Effendi," whose career is sketched, from his nursery and school days, to the time when, as a representative of the *Kalam*, he issues forth with his "borrowed phrases" about progress, his "*morbus Gallicus*," his love for light novels, for cafés chantants, and French frivolity in general. Further on our author indicates where are to be found bright and honourable exceptions to the foregoing description, but concludes that, from this class, Islam has nothing to hope. At any rate, one use of the "ephemeral Stamboollee clique" is to serve as a weathercock . . . indicative only of the Westerly breeze "that for some years past, sweeping over the Bosphorus and the Ægean, is now awakening a yet stronger counterblast of Easterly antagonism." Quite different is the spirit of the Ottoman soldier: and some of the most interesting pages in the volume are those describing his kindly treatment from the moment he leaves his native village, as a raw and bewept recruit; his barrack life; his comfortable hospital life also, when he requires it; his uniformly excellent behaviour; and his relations towards his superiors. To his courage Mr Palgrave pays the highest tribute, Crimean stories notwithstanding; while, in point of sobriety and general morality, our own Christian "hired butcher" would seem to lag sadly behind his infidel fellow-craftsman. Also, that professional feeling, which links together all members of the Ottoman army, "from the general to the bandsman," is in marked contrast to what we find in our more "civilised" English army; but, of course, the exclusiveness in the second instance belongs to the glory of the British Constitution. A thorough reconciliation of easy familiarity with respectful obedience comes more naturally to a man the spirit of whose theory of individual worth is implied in the words, "There is no nobility but that of Islam," than to another, to whom nobility means the title, rent, and game-preserves inherited from a good, bad, or indifferent ancestor. But the following extract must suffice for further mention of the Ottoman soldier, with his peculiar notions of nobility:

> With the military jacket the Osmanlee puts on also the mantle of zeal dropped by the Prophet on his best followers; and in this zeal, whether we stigmatise it under the name of fanaticism, or decorate it as patriotic enthusiasm, lies the true secret of the strength of that young-old army. . . . The fire of Islam may have been covered, seemingly choked, under the ashes of poverty and care, while the future soldiers were yet in their village homes; once within roll-call, the ashes are blown away and the flame bursts forth as bright as ever.

But after all, says our author, the future of the Ottoman East lies in the masses of the people—Turks, Turkomans, Koordes, Syrians, etc. Of these masses, the agriculturists — including proprietors and tenants — are estimated by him to make up two-thirds of the whole population. In this case, the "hopes of Islam" are based on discontent, which, in the case of noble and peasant, arises from a common source—the "reforms," namely, of Mahmoud II. and Abdul Medjid, by which the former were deprived of their estates and excluded from any share in the work of government, and the latter were made to exchange the light burdens of a semi-feudal condition for extortionate demands that not only do not result in any adequate return, but have caused ruined houses and deserted villages. In the eyes of the old proprietor-class, the Stamboollee, with his "sham centralisation," is but a traitor to the cause of Islam. Now, the reader may, if he choose, deny the truth of the foregoing picture; but it would be worth his while to compare

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back with particulars that made them seem an odious deceit. He had married her with that bad past life hidden behind him, and she had no faith left to protest his innocence of the worst that was imputed to him. Her honest ostentatious nature made the sharing of a merited dishonour as bitter as it could be to any mortal.

But this imperfectly-taught woman, whose phrases and habits were an odd patchwork, had a loyal spirit within her. The man whose prosperity she had shared through nearly half a life, and who had unvaryingly cherished her—now that punishment had befallen him it was not possible to her in any sense to forsake him. There is a forsaking which still sits at the same board and lies on the same couch with the forsaken soul, withering it the more by unloving proximity. She knew, when she locked her door, that she should unlock it ready to go down to her unhappy husband and espouse his sorrow, and say of his guilt, I will mourn and not reproach. But she needed time to gather up her strength: she needed to sob out her farewell to all the gladness and pride of her life. When she had resolved to go down, she prepared herself by some little acts which might seem mere folly to a hard onlooker; they were her way of expressing to all spectators visible or invisible that she had begun a new life in which she embraced humiliation. She took off all her ornaments and put on a plain black gown, and instead of wearing her much-adorned cap and large bows of hair, she brushed her hair down and put on a plain bonnet-cap, which made her look suddenly like an early Methodist.

Bulstrode, who knew that his wife had been out and had come in saying that she was not well, had spent the time in an agitation equal to hers. He had looked forward to her learning the truth from others, and had acquiesced in that probability, as something easier to him than any confession. But now that he imagined the moment of her knowledge come, he awaited the result in anguish. His daughters had been obliged to consent to leave him, and though he had allowed some food to be brought to him, he had not touched it. He felt himself perishing slowly in unpitied misery. Perhaps he should never see his wife's face with affection in it again. And if he turned to God, there seemed to be no answer but the pressure of retribution.

It was eight o'clock in the evening before the door opened and his wife entered. He dared not look up at her. He sat with his eyes bent down, and as she went towards him she thought he looked smaller—he seemed so withered and shrunken. A movement of new compassion and old tenderness went through her like a great wave, and putting one hand on his which rested on the arm of the chair, and the other on his shoulder, she said, solemnly but kindly—

"Look up, Nicholas."

He raised his eyes with a little start and looked at her half amazed for a moment: her pale face, her changed, mourning dress, the trembling about her mouth, all said, "I know;" and her hands and eyes rested gently on him. He burst out crying and they cried together, she sitting at his side. They could not yet speak to each other of the shame which she was bearing with him, or of the acts which had brought it down on them. His confession was silent, and her promise of faithfulness was silent. Open-minded as she was, she nevertheless shrank from the words which would have expressed their mutual consciousness, as she would have shrunk from flakes of fire. She could not say, "How much is only slander and false suspicion?" and he did not say, "I am innocent."

The charity of 'Middlemarch' is as notable as its wisdom. In every way it is a book to be glad of; and if it does not enhance George Eliot's fame, it will only be because she has already attained the foremost rank among novelists who write novels that contain more religion than all the sermons that were ever penned, and enough sound philosophy to make the reputation of half a dozen moralists and metaphysicians.

MR DARWIN ON THE EXPRESSION OF THE EMOTIONS.

(*Second Notice.*)

The Expression of the Emotions in Man and Animals. By Charles Darwin, M.A., F.R.S., &c. Murray.

In a previous article we drew attention to the first of Mr Darwin's principles for explaining the characters of expression, the principle, as he names it, of serviceable associated habits. It is simply the tendency of habitual action to be transmitted by inheritance. The other two principles have less connection with Mr Darwin's system, and one of them is quite original. "Certain states of the mind lead, as we have seen in the last chapter, to certain habitual movements which were primarily, or may still be, of service; and we shall find that, when a directly opposite state of mind is induced, there is a strong and involuntary tendency to the performance of movements of a directly opposite nature, though they have never been of any use." This is called the principle of antithesis. A simple instance is in the contrast between shrugging the shoulders, as expressing impotence or an apology, and the erect, firm attitude of defiance or indignation. But the examples on which Mr Darwin chiefly relies are the dog and the cat in their opposite states of affection and rage. It is difficult to follow his description without the aid of his woodcuts, but the points contrasted are easily observed. "When a dog approaches a strange dog or man in a savage or hostile frame of mind, he walks upright and very stiffly; his head is slightly raised, or not much lowered; the tail is held erect and quite rigid; the hairs bristle, especially along the neck and back; the pricked ears are directed forwards, and the eyes have a fixed stare." Suppose, however, the dog finds the supposed enemy to be his master, his bearing is at once changed. "The body sinks downwards, or even crouches, and is thrown into flexuous movement; his tail is lowered and wagged from side to side; his hair instantly becomes smooth; his ears are depressed and drawn backwards, and his lips hang loosely." This instance is admirably in point, for the contrast between the two states of feeling is kept up in every detail of the physical expression. But it would not go far to show that the movements were opposed just because the feelings were contrary. To strengthen his position Mr Darwin takes another instance, where the movements are very different, but the contrast exists. When a cat is savage, it assumes a crouching position, just as if it were preparing to spring on its prey; but when it is affectionate, it arches its back, holds its tail stiff, and purrs, instead of growling. The movements by which a cat and a dog respectively express anger and affection are very different, but they agree in the contrast between the movements and the feelings.

If we were sure no other circumstance was common to the two cases but the contrast, the evidence would be conclusive, but that is precisely what it is most difficult to ascertain. In another case mentioned by Mr Darwin, we seem to come on a different explanation. He had a large dog which was much pleased to go out walking. "He showed his pleasure by trotting gravely before us with high steps, head much raised, moderately erected ears, and tail carried aloft but not stiffly." But when Mr Darwin turned aside, and the dog expected to lose its walk, its expression underwent a complete change, which was described by his family as the dog's "hot-house face." It 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." This change Mr Darwin attributes to antithesis, but another explanation, which seems to us more probable, is mentioned by himself. "Had not the change been so instantaneous, I should have attributed it to his lowered spirits affecting, 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." We feel disposed to go further, and say it accounts for the whole phenomenon. The instantaneousness of the change ought not to weigh so much, because this action had been often repeated. When Mr Darwin went out to walk, the dog was accustomed to fear that he might turn aside and discontinue the walk, and the habitual expectation would render the transition more rapid and easy. In fact, we should think the quickness of the change was due to habit, and that it simply illustrates the rule, well explained by Dr Bain, that pain is accompanied by a diminution in the activity of the vital functions. Mr Darwin recognises this principle throughout his book. Speaking of young ourangs and chimpanzees when sick, he says: "The state of mind and body is shown by their listless movements, fallen countenances, dull eyes, and changed complexion." Again, he remarks, that fear is the most depressing of all the emotions, and it soon induces utter, helpless prostration. He also observes that "even extreme fear often acts at first as a powerful stimulant." We think Mr Darwin's first principle gives a clue to this apparent aberration. From time immemorial animals have been accustomed to make tremendous exertions to save their life, and after ages of habitual resistance to the first assault of pain, a connection between strong efforts and pain would be established, in other words, a connection by which in an emergency the system may draw its whole available capital and use it up. Although, however, some of the cases selected by Mr Darwin to illustrate his principle of antithesis may be explained by the general fact of the physical

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effect of pain, yet the others seem to be best explained on his principle of antithesis.

The third principle resorted to by Mr Darwin brings him into connection with Mr Herbert Spencer, as the second does with Dr Bain. "When the sensorium is strongly excited, nerve-force is generated in excess, and is transmitted in certain directions, dependent on the direction of the nerve-cells, and, as far as the muscular system is concerned, on the nature of the movements which have been habitually practised." An instance of what is meant by this action is the rare, but striking, case when the hair loses its colour under extreme terror or grief. Trembling is another example. "The manner in which the secretions of the alimentary canal and of certain glands—the liver, kidneys, or mammæ, are affected by strong emotions, is another excellent instance of the direct action of the sensorium on these organs, independently of the will or of any serviceable associated habit." Upon this principle Mr Darwin explains some of the effects of rage; the disturbance or acceleration of the heart's action, the reddening of the face, the laboured respiration, the heaving of the chest, and the quivering of the dilated nostrils. A somewhat curious way of putting the clenching of the teeth is given. "There is said to be gnashing of teeth in hell; and I have plainly heard the grinding of the molar teeth of a cow which was suffering acutely from inflammation of the bowels."

After stating and illustrating his principles at some length, Mr Darwin proceeds to gather together in a series of chapters what he has been able to observe, or to get others to observe, of the expressions employed by man and animals. This arrangement will doubtless make the book more interesting, but it interferes considerably with any attempt to follow out his three principles. One of the most valuable chapters, as might be expected, is that which deals with the expression of emotion by animals. The general expressions are enumerated under four heads, the emission of sounds, erection of the dermal appendages, the inflation of the body, and the drawing back and pressure of the ears to the head. The emission of sounds from the vocal organs is discussed at length, but Mr Darwin points out other curious modes in which noises are made by some animals, as the rattling of their quills by porcupines, the stamping of their feet by rabbits, the clattering of their beaks by storks, the stridulation of many insects, and the grating noise produced by some snakes. The erection of hair is common with the chimpanzee and ourang, and dogs, and is to be compared with the ruffling of their feathers by many birds. Mr Darwin regards the erection of the dermal appendages as a reflex action, and looks upon it not "as a power acquired for the sake of some advantage, but as an incidental result, at least to a large extent, of the sensorium being affected." The hair of man is often spoken of in dramas as standing on end, but it may be doubted whether that often happens, except in the insane. In regard to these, the observations of Dr Crichton Browne leave no doubt that the erection of the hair under the influence of sudden and extreme terror is a characteristic of some of the insane. Smoothing of the hair is often a sign of the departure of a paroxysm.

Not one of Mr Darwin's dissertations is tame; all of them, on the expression of slyness, shrugging the shoulders, "uncovering the canine," nodding and shaking the head, are extremely interesting; but we shall only refer to two others—weeping and blushing. In examining the causes of weeping, Mr Darwin begins by pointing out two important facts, first, that weeping is not exclusively an expression of sorrow, it also occurs after a paroxysm of violent laughter, violent coughing, violent retching; in short, "whenever the muscles round the eyes are strongly and involuntarily contracted in order to compress the blood-vessels and thus to protect the eyes." The other fact is that infants, notwithstanding their well-known powers of screaming, do not weep "until they have attained the age of from two to three or four months." This Mr Darwin attributes to a delay in the functional activity of the lachrymal glands. He has endeavoured to find out whether in any other animals there is "a similar relation between the contraction of the orbicular muscles during violent expiration and the secretion of tears;" but there are few animals satisfying either of the conditions. Nevertheless, he has found the orbicular contraction in elephants, and they are said to weep. The voluntary contraction of the orbicular muscles, however energetic, does not cause the secretion of tears. Mr Darwin thus sums up his views on this point:

> Weeping is probably the result of some such chain of events as follows. Children, when wanting food, or suffering in any way, cry out loudly, like the young of most other animals, partly as a call to their parents for aid, and partly from any great exertion serving as a relief. Prolonged screaming inevitably leads to the gorging of the blood-vessels of the eye; and this will have led, at first consciously and at last habitually, to the contraction of the muscles round the eyes, in order to protect them. At the same time, the spasmodic pressure on the surface of the eye, and the distension of the vessels within the eye, without necessarily entailing any conscious sensation, will have effected, through reflex action, the lacrymal glands. Finally, through the three principles of nerve-force readily passing along accustomed channels—of association, which is so widely extended in its power—and of certain actions, being more under the control of the will than others—it has come to pass that suffering readily causes the secretion of tears without being necessarily accompanied by any other action.

Mr Darwin's account of "blushing" is, perhaps, the most ingenious and satisfactory in his book. Blushing is confined to man. Infants under two or three years never blush, and idiots rarely. Dr Behn relates one case of a microcephalous idiot, thirteen years old, blushing and turning to one side, when undressed for medical examination, but Dr Crichton Browne never observed any genuine blush in any of the idiots in his asylum. Mr Darwin's remarks deal with two points,—what is the mental feeling that gives rise to blushing, and how has the connection between them originated? A common, but superficial, idea is that blushing is a sign of conscious guilt. This has just as much truth in it as the mode of testing guilt by giving an alleged criminal something to chew; terror stops the flow of saliva, whether caused by guilt or otherwise. One of the causes of shame is moral guilt, but the primary cause is probably self-attention to personal appearance. For that reason, women being more solicitous about their personal appearance, and being also more sensitive to the disapprobation of others, are more given to blushing than men, and young persons than old. In the same way young women and men are most apt to blush in the presence of each other, because their sensitiveness to their personal appearance is then at its greatest. Blushing seems to be a universal expression, found in all races where the skin is not too dark to make it invisible, and with the races of men who habitually go nearly naked the blushes extend over a much larger surface than with us. The primitive man, who seldom troubles himself much about moral distinctions, is not incapable of feeling pleased with his personal appearance, and the probability is that blushing was at first exclusively caused with reference to the face, and shame for moral guilt formed an extension of the early expression. A sensitiveness to the disapprobation of others on account of moral delinquencies would easily excite the same expression as sensitiveness to the opinion of others about one's person. But why, so to speak, reduce all shame to "shame-faced-ness?" We need not say that Mr Darwin does not accept Sir C. Bell's theory that blushing "is a provision for expression, as may be inferred from the colour extending only to the surface of the face, neck, and breast, the parts most exposed—it is not acquired; it is from the beginning;" or Dr Burgess's remark, that it was designed by the Creator in "order that the soul might have sovereign power of displaying the various internal emotions of the moral feelings." The explanation adopted, although it may sound strange to those who are unacquainted with analogous facts, is that

> attention closely directed to any part of the body tends to interfere with the ordinary and tonic contractions of the small arteries of that part. These vessels, in consequence, become at such times more or less relaxed, and are instantly filled with arterial blood. This tendency will have been much strengthened, if frequent attention has been paid during many generations to the same part. . . . Whenever we believe that others are deprecating or even considering our personal appearance, our attention is vividly directed to the outer and visible parts of our bodies; and of all such parts we are most sensitive about our faces, as no doubt has been the case during many past generations. Therefore, assuming for the moment that the capillary vessels can be acted on by close attention, those of the face will have become eminently susceptible. Through the force of association, the same effects will tend to follow whenever we think that others are considering or censuring our actions or character.

Upon the cardinal point of this explanation, the power of close attention to act on the capillaries, many analogous facts have been noted, and Sir H. Holland, Prof. Laycock, and others have drawn attention to them. We think a better guess has never been made, and that the cause of blushing may now be reckoned among the things that are known. The other explanations in the book are admirably supported, and certainly carry the "science of expression" much further than has ever been done. Mr Darwin's book is also important from the fact that he explains expression from his general point of view, and thus another province is added to the realm of natural history as re-arranged by natural selection. By the student of mind, as well as by the naturalist, this book must be regarded as one of great importance, and we can give it no higher praise than by saying that it is alike worthy of the great works Mr Darwin has already given us, and of the subject to which he has applied his unrivalled genius and research.

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