From the Author

with much Respect.

THE

EXPRESSION OF THE EMOTIONS

IN

MAN AND ANIMALS.

By CHARLES DARWIN, M.A., F.R.S., &c.

WITH PHOTOGRAPHIC AND OTHER ILLUSTRATIONS.

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ON THE EXPRESSION

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EMOTIONS IN MAN AND ANIMALS.

INTRODUCTION.

MANY works have been written on Expression, but a greater number on Physiognomy,—that is, on the recognition of character through the study of the permanent form of the features. With this latter subject I am not here concerned. The older treatises,[1] which I have consulted, have been of little or no service to me. The famous 'Conférences'[2] of the painter Le Brun, published in 1667, is the best known ancient work, and contains some good remarks. Another somewhat old essay, namely, the 'Discours,' delivered 1774–1782, by the well-known Dutch anatomist Camper,[3] can hardly be considered as having made any marked advance in the subject. The following works, on the contrary, deserve the fullest consideration.

[1] J. Parsons, in his paper in the Appendix to the 'Philosophical Transactions' for 1746, p. 41, gives a list of forty-one old authors who have written on Expression.

[2] 'Conférences sur l'expression des différents Caractères des Passions.' Paris, 4to, 1667. I always quote from the republication of the 'Conférences' in the edition of Lavater, by Moreau, which appeared in 1820, as given in vol. ix. p. 257.

[3] 'Discours par Pierre Camper sur le moyen de représenter les diverses passions,' &c. 1792.

Sir Charles Bell, so illustrious for his discoveries in physiology, published in 1806 the first edition, and in 1844 the third edition of his 'Anatomy and Philosophy of Expression.'[4] He may with justice be said, not only to have laid the foundations of the subject as a branch of science, but to have built up a noble structure. His work is in every way deeply interesting; it includes graphic descriptions of the various emotions, and is admirably illustrated. It is generally admitted that his service consists chiefly in having shown the intimate relation which exists between the movements of expression and those of respiration. One of the most important points, small as it may at first appear, is that the muscles round the eyes are involuntarily contracted during violent expiratory efforts, in order to protect these delicate organs from the pressure of the blood. This fact, which has been fully investigated for me with the greatest kindness by Professor Donders of Utrecht, throws, as we shall hereafter see, a flood of light on several of the most important expressions of the human countenance. The merits of Sir C. Bell's work have been undervalued or quite ignored by several foreign writers, but have been fully admitted by some, for instance by M. Lemoine,[5] who with great justice says:—"Le livre de Ch. Bell devrait être médité par "quiconque essaye de faire parler le visage de l'homme, "par les philosophes aussi bien que par les artistes, "car, sous une apparence plus légère et sous le prétexte "de l'esthétique, c'est un des plus beaux monu-

[4] I always quote from the third edition, 1844, which was published after the death of Sir C. Bell, and contains his latest corrections. The first edition of 1806 is much inferior in merit, and does not include some of his more important views.

[5] 'De la Physionomie et de la Parole,' par Albert Lemoine, 1865, p. 101.

" ments de la science des rapports du physique et du " moral."

From reasons which will presently be assigned, Sir C. Bell did not attempt to follow out his views as far as they might have been carried. He does not try to 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.

In 1807 M. Moreau edited an edition of Lavater on Physiognomy,[6] in which he incorporated several of his own essays, containing excellent descriptions of the movements of the facial muscles, together with many valuable remarks. He throws, however, very little light on the philosophy of the subject. For instance, M. Moreau, in speaking of the act of frowning, that is, of the contraction of the muscle called by

[6] 'L'Art de connaître les Hommes,' &c., par G. Lavater. The earliest edition of this work, referred to in the preface to the edition of 1820 in ten volumes, as containing the observations of M. Moreau, is said to have been published in 1807; and I have no doubt that this is correct, because the 'Notice sur Lavater' at the commencement of volume i. is dated April 13, 1806. In some bibliographical works, however, the date of 1805–1809 is given; but it seems impossible that 1805 can be correct. Dr. Duchenne remarks ('Mécanisme de la Physionomie Humaine,' 8vo edit. 1862, p. 5, and 'Archives Générales de Médecine,' Jan. et Fév. 1862) that M. Moreau "*a composé pour son ouvrage un article important*," &c., in the year 1805; and I find in volume i. of the edition of 1820 passages bearing the dates of December 12, 1805, and another January 5, 1806, besides that of April 13, 1806, above referred to. In consequence of some of these passages having thus been *composed* in 1805, Dr. Duchenne assigns to M. Moreau the priority over Sir C. Bell, whose work, as we have seen, was published in 1806. This is a very unusual manner of determining the priority of scientific works; but such questions are of extremely little importance in comparison with their relative merits. The passages above quoted from M. Moreau and from Le Brun are taken in this and all other cases from the edition of 1820 of Lavater, tom. iv. p. 228, and tom. ix. p. 279.

French writers the *sourcilier* (*corrugator supercilii*), remarks with truth:—"Cette action des sourciliers est "un des symptômes les plus tranchés de l'expression "des affections pénibles ou concentrées." He then adds that these muscles, from their attachment and position, are fitted "à resserrer, à concentrer les princi- "paux traits de la *face*, comme il convient dans toutes "ces passions vraiment oppressives ou profondes, dans "ces affections dont le sentiment semble porter l'orga- "nisation à revenir sur elle-même, à se contracter et "à *s'amoindrir*, comme pour offrir moins de prise et de "surface à des impressions redoutables ou importunes." He who thinks that remarks of this kind throw any light on the meaning or origin of the different expressions, takes a very different view of the subject to what I do.

In the above passage there is but a slight, if any, advance in the philosophy of the subject, beyond that reached by the painter Le Brun, who, in 1667, in describing the expression of fright, says:—"Le sourcil "qui est abaissé d'un côté et élevé de l'autre, fait voir "que la partie élevée semble le vouloir joindre au "cerveau pour le garantir du mal que l'âme aperçoit, "et le côté qui est abaissé et qui paraît enflé, nous fait "trouver dans cet état par les esprits qui viennent du "cerveau en abondance, comme pour couvrir l'ame et "la défendre du mal qu'elle craint; la bouche fort "ouverte fait voir le saisissement du cœur, par le "sang qui se retire vers lui, ce qui l'oblige, voulant "respirer, à faire un effort qui est cause que la bouche "s'ouvre extrêmement, et qui, lorsqu'il passe par les "organes de la voix, forme un son qui n'est point "articulé; que si les muscles et les veines paraissent "enflés, ce n'est que par les esprits que le cerveau "envoie en ces parties-là." I have thought the fore-

going sentences worth quoting, as specimens of the surprising nonsense which has been written on the subject.

'The Physiology or Mechanism of Blushing,' by Dr. Burgess, appeared in 1839, and to this work I shall frequently refer in my thirteenth Chapter.

In 1862 Dr. Duchenne published two editions, in folio and octavo, of his 'Mécanisme de la Physionomie 'Humaine,' in which he analyses by means of electricity, and illustrates by magnificent photographs, the movements of the facial muscles. He has generously permitted me to copy as many of his photographs as I desired. His works have been spoken lightly of, or quite passed over, by some of his countrymen. It is possible that Dr. Duchenne may have exaggerated the importance of the contraction of single muscles in giving expression; for, owing to the intimate manner in which the muscles are connected, as may be seen in Henle's anatomical drawings[7]—the best I believe ever published—it is difficult to believe in their separate action. Nevertheless, it is manifest that Dr. Duchenne clearly apprehended this and other sources of error, and as it is known that he was eminently successful in elucidating the physiology of the muscles of the hand by the aid of electricity, it is probable that he is generally in the right about the muscles of the face. In my opinion, Dr. Duchenne has greatly advanced the subject by his treatment of it. No one has more carefully studied the contraction of each separate muscle, and the consequent furrows produced on the skin. He has also, and this is a very important service, shown which muscles

7 'Handbuch der Systematischen Anatomie des Menschen.' Band I. Dritte Abtheilung, 1858.

are least under the separate control of the will. He enters very little into theoretical considerations, and seldom attempts to explain why certain muscles and not others contract under the influence of certain emotions.

A distinguished French anatomist, Pierre Gratiolet, gave a course of lectures on Expression at the Sorbonne, and his notes were published (1865) after his death, under the title of 'De la Physionomie et des Mouvements d'Expression.' This is a very interesting work, full of valuable observations. His theory is rather complex, and, as far as it can be given in a single sentence (p. 65), is as follows:—"Il résulte, de tous les "faits que j'ai rappelés, que les sens, l'imagination et "la pensée elle-même, si élevée, si abstraite qu'on la "suppose, ne peuvent s'exercer sans éveiller un senti-"ment corrélatif, et que ce sentiment se traduit "directement, sympathiquement, symboliquement ou "métaphoriquement, dans toutes les sphères des or-"ganes extérieurs, qui le racontent tous, suivant leur "mode d'action propre, comme si chacun d'eux avait "été directement affecté."

Gratiolet appears to overlook inherited habit, and even to some extent habit in the individual; and therefore he fails, as it seems to me, to give the right explanation, or any explanation at all, of many gestures and expressions. As an illustration of what he calls symbolic movements, I will quote his remarks (p. 37), taken from M. Chevreul, on a man playing at billiards. "Si une bille dévie légèrement de la direc-"tion que le joueur prétend lui imprimer, ne l'avez-vous "pas vu cent fois la pousser du regard, de la tête et "même des épaules, comme si ces mouvements, pure-"ment symboliques, pouvaient rectifier son trajet? Des "mouvements non moins significatifs se produisent

" quand la bille manque d'une impulsion suffisante. Et, " chez les joueurs novices, ils sont quelquefois accusés " au point d'éveiller le sourire sur les lèvres des spec- " tateurs." Such movements, as it appears to me, may be attributed simply to habit. As often as a man has wished to move an object to one side, he has always pushed it to that side; when forwards, he has pushed it forwards; and if he has wished to arrest it, he has pulled backwards. Therefore, when a man sees his ball travelling in a wrong direction, and he intensely wishes it to go in another direction, he cannot avoid, from long habit, unconsciously performing movements which in other cases he has found effectual.

As an instance of sympathetic movements Gratiolet gives (p. 212) the following case:—" un jeune chien à " oreilles droites, auquel son maître présente de loin " quelque viande appétissante, fixe avec ardeur ses " yeux sur cet objet dont il suit tous les mouvements, " et pendant que les yeux regardent, les deux oreilles " se portent en avant comme si cet objet pouvait être " entendu." Here, instead of speaking of sympathy between the ears and eyes, it appears to me more simple to believe, that as dogs during many generations have, whilst intently looking at any object, pricked their ears in order to perceive any sound; and conversely have looked intently in the direction of a sound to which they may have listened, the movements of these organs have become firmly associated together through long-continued habit.

Dr. Piderit published in 1859 an essay on Expression, which I have not seen, but in which, as he states, he forestalled Gratiolet in many of his views. In 1867 he published his 'Wissenschaftliches System der Mimik und Physiognomik.' It is hardly possible to give in a few sentences a fair notion of his views; perhaps the

two following sentences will tell as much as can be briefly told: "the muscular movements of expression "are in part related to imaginary objects, and in part "to imaginary sensorial impressions. In this propo- "sition lies the key to the comprehension of all "expressive muscular movements." (s. 25.) Again, "Expressive movements manifest themselves chiefly "in the numerous and mobile muscles of the face, "partly because the nerves by which they are set into "motion originate in the most immediate vicinity of "the mind-organ, but partly also because these muscles "serve to support the organs of sense." (s. 26.) If Dr. Piderit had studied Sir C. Bell's work, he would probably not have said (s. 101) that violent laughter causes a frown from partaking of the nature of pain; or that with infants (s. 103) the tears irritate the eyes, and thus excite the contraction of the surrounding muscles. Many good remarks are scattered throughout this volume, to which I shall hereafter refer.

Short discussions on Expression may be found in various works, which need not here be particularised. Mr. Bain, however, in two of his works has treated the subject at some length. He says,[8] "I look upon the "expression so-called as part and parcel of the feel- "ing. I believe it to be a general law of the mind that, "along with the fact of inward feeling or conscious- "ness, there is a diffusive action or excitement over "the bodily members." In another place he adds, "A "very considerable number of the facts may be brought "under the following principle: namely, that states of "pleasure are connected with an increase, and states "of pain with an abatement, of some, or all, of the

[8] 'The Senses and the Intellect,' 2nd edit. 1864, pp. 96 and 288. The preface to the first edition of this work is dated June, 1855. See also the 2nd edition of Mr. Bain's work on the 'Emotions and Will.'

"vital functions." But the above law of the diffusive action of feelings seems too general to throw much light on special expressions.

Mr. Herbert Spencer, in treating of the Feelings in his 'Principles of Psychology' (1855), makes the following remarks:—"Fear, when strong, expresses itself "in cries, in efforts to hide or escape, in palpitations "and tremblings; and these are just the manifestations "that would accompany an actual experience of the "evil feared. The destructive passions are shown in a "general tension of the muscular system, in gnashing of "the teeth and protrusion of the claws, in dilated eyes "and nostrils, in growls; and these are weaker forms of "the actions that accompany the killing of prey." Here we have, as I believe, the true theory of a large number of expressions; but the chief interest and difficulty of the subject lies in following out the wonderfully complex results. I infer that some one (but who he is I have not been able to ascertain) formerly advanced a nearly similar view, for Sir C. Bell says,[9] "It has been maintained that what are called the ex-"ternal signs of passion, are only the concomitants of "those voluntary movements which the structure ren-"ders necessary." Mr. Spencer has also published[10] a valuable essay on the physiology of Laughter, in which he insists on "the general law that feeling "passing a certain pitch, habitually vents itself in "bodily action;" and that "an overflow of nerve-force "undirected by any motive, will manifestly take first "the most habitual routes; and if these do not suffice, "will next overflow into the less habitual ones." This

[9] 'The Anatomy of Expression,' 3rd edit. p. 121.

[10] 'Essays, Scientific, Political, and Speculative,' Second Series, 1863, p. 111. There is a discussion on Laughter in the First Series of Essays, which discussion seems to me of very inferior value.

law I believe to be of the highest importance in throwing light on our subject.[11]

All the authors who have written on Expression, with the exception of Mr. Spencer—the great expounder of the principle of Evolution—appear to have been firmly convinced that species, man of course included, came into existence in their present condition. Sir C. Bell, being thus convinced, maintains that many of our facial muscles are "purely instrumental in ex-" pression;" or are "a special provision" for this sole object.[12] But the simple fact that the anthropoid apes possess the same facial muscles as we do,[13] renders it very improbable that these muscles in our case serve exclusively for expression; for no one, I presume, would be inclined to admit that monkeys have been endowed with special muscles solely for exhibiting their hideous grimaces. Distinct uses, independently of expression, can indeed be assigned with much probability for almost all the facial muscles.

Sir C. Bell evidently wished to draw as broad a distinction as possible between man and the lower animals; and he consequently asserts that with "the

[11] Since the publication of the essay just referred to, Mr. Spencer has written another, on "Morals and Moral Sentiments," in the 'Fortnightly Review,' April 1, 1871, p. 426. He has, also, now published his final conclusions in vol. ii. of the second edit. of the 'Principles of Psychology,' 1872, p. 539. I may state, in order that I may not be accused of trespassing on Mr. Spencer's domain, that I announced in my 'Descent of Man,' that I had then written a part of the present volume: my first MS. notes on the subject of expression bear the date of the year 1838.

[12] 'Anatomy of Expression,' 3rd edit. pp. 98, 121, 131.

[13] Professor Owen expressly states (Proc. Zoolog. Soc. 1830, p. 28) that this is the case with respect to the Orang, and specifies all the more important muscles which are well known to serve with man for the expression of his feelings. See, also, a description of several of the facial muscles in the Chimpanzee, by Prof. Macalister, in 'Annals and Magazine of Natural History,' vol. vii. May, 1871, p. 342.

"lower creatures there is no expression but what may "be referred, more or less plainly, to their acts of "volition or necessary instincts." He further maintains that their faces "seem chiefly capable of expressing "rage and fear."[14] But man himself cannot express love and humility by external signs, so plainly as does a dog, when with drooping ears, hanging lips, flexuous body, and wagging tail, he meets his beloved master. Nor can these movements in the dog be explained by acts of volition or necessary instincts, any more than the beaming eyes and smiling cheeks of a man when he meets an old friend. If Sir C. Bell had been questioned about the expression of affection in the dog, he would no doubt have answered that this animal had been created with special instincts, adapting him for association with man, and that all further enquiry on the subject was superfluous.

Although Gratiolet emphatically denies[15] that any muscle has been developed solely for the sake of expression, he seems never to have reflected on the principle of evolution. He apparently looks at each species as a separate creation. So it is with the other writers on Expression. For instance, Dr. Duchenne, after speaking of the movements of the limbs, refers to those which give expression to the face, and remarks:[16] "Le créateur n'a donc pas eu à se "préoccuper ici des besoins de la mécanique; il a "pu, selon sa sagesse, ou — que l'on me pardonne "cette manière de parler—par une divine fantaisie, "mettre en action tel ou tel muscle, un seul ou plu-"sieurs muscles à la fois, lorsqu'il a voulu que les "signes caractéristiques des passions, même les plus

[14] 'Anatomy of Expression,' pp. 121, 138.

[15] 'De la Physionomie,' pp. 12, 73.

[16] 'Mécanisme de la Physionomie Humaine,' 8vo edit. p. 31.

" fugaces, fussent écrits passagèrement sur la face de " l'homme. Ce langage de la physionomie une fois " créé, il lui a suffi, pour le rendre universel et im- " muable, de donner à tout être humain la faculté " instinctive d'exprimer toujours ses sentiments par " la contraction des mêmes muscles."

Many writers consider the whole subject of Expression as inexplicable. Thus the illustrious physiologist Müller, says,[17] " The completely different expression of the " features in different passions shows that, according to " the kind of feeling excited, entirely different groups " of the fibres of the facial nerve are acted on. Of the " cause of this we are quite ignorant."

No doubt as long as man and all other animals are viewed as independent creations, an effectual stop is put to our natural desire to investigate as far as possible the causes of Expression. By this doctrine, anything and everything can be equally well explained; and it as proved as pernicious with respect to Expression as to every other branch of natural history. With mankind some expressions, such as the bristling of the hair under the influence of extreme terror, or the uncovering of the teeth under that of furious rage, can hardly be understood, except on the belief that man once existed in a much lower and animal-like condition. The community of certain expressions in distinct though allied species, as in the movements of the same facial muscles during laughter by man and by various monkeys, is rendered somewhat more intelligible, if we believe in their descent from a common progenitor. He who admits on general grounds that the structure and habits of all animals have been gradually evolved, will look at the whole subject of Expression in a new and interesting light.

[17] 'Elements of Physiology,' English translation, vol. ii. p. 934.

The study of Expression is difficult, owing to the movements being often extremely slight, and of a fleeting nature. A difference may be clearly perceived, and yet it may be impossible, at least I have found it so, to state in what the difference consists. When we witness any deep emotion, our sympathy is so strongly excited, that close observation is forgotten or rendered almost impossible; of which fact I have had many curious proofs. Our imagination is another and still more serious source of error; for if from the nature of the circumstances we expect to see any expression, we readily imagine its presence. Notwithstanding Dr. Duchenne's great experience, he for a long time fancied, as he states, that several muscles contracted under certain emotions, whereas he ultimately convinced himself that the movement was confined to a single muscle.

In order to acquire as good a foundation as possible, and to ascertain, independently of common opinion, how far particular movements of the features and gestures are really expressive of certain states of the mind, I have found the following means the most serviceable. In the first place, to observe infants; for they exhibit many emotions, as Sir C. Bell remarks, "with extraordinary force;" whereas, in after life, some of our expressions "cease to have the pure and simple "source from which they spring in infancy."[18]

In the second place, it occurred to me that the insane ought to be studied, as they are liable to the strongest passions, and give uncontrolled vent to them. I had, myself, no opportunity of doing this, so I applied to Dr. Maudsley, and received from him an introduction to Dr. J. Crichton Browne, who has charge

[18] 'Anatomy of Expression,' 3rd edit. p. 198.

of an immense asylum near Wakefield, and who, as I found, had already attended to the subject. This excellent observer has with unwearied kindness sent me copious notes and descriptions, with valuable suggestions on many points; and I can hardly over-estimate the value of his assistance. I owe also, to the kindness of Mr. Patrick Nicol, of the Sussex Lunatic Asylum, interesting statements on two or three points.

Thirdly, Dr. Duchenne galvanized, as we have already seen, certain muscles in the face of an old man, whose skin was little sensitive, and thus produced various expressions which were photographed on a large scale. It fortunately occurred to me to show several of the best plates, without a word of explanation, to above twenty educated persons of various ages and both sexes, asking them, in each case, by what emotion or feeling the old man was supposed to be agitated; and I recorded their answers in the words which they used. Several of the expressions were instantly recognised by almost everyone, though described in not exactly the same terms; and these may, I think, be relied on as truthful, and will hereafter be specified. On the other hand, the most widely different judgments were pronounced in regard to some of them. This exhibition was of use in another way, by convincing me how easily we may be misguided by our imagination; for when I first looked through Dr. Duchenne's photographs, reading at the same time the text, and thus learning what was intended, I was struck with admiration at the truthfulness of all, with only a few exceptions. Nevertheless, if I had examined them without any explanation, no doubt I should have been as much perplexed, in some cases, as other persons have been.

Fourthly, I had hoped to derive much aid from the great masters in painting and sculpture, who are such

close observers. Accordingly, I have looked at photographs and engravings of many well-known works; but, with a few exceptions, have not thus profited. The reason no doubt is, that in works of art, beauty is the chief object; and strongly contracted facial muscles destroy beauty.[19] The story of the composition is generally told with wonderful force and truth by skilfully given accessories.

Fifthly, it seemed to me highly important to ascertain whether the same expressions and gestures prevail, as has often been asserted without much evidence, with all the races of mankind, especially with those who have associated but little with Europeans. Whenever the same movements of the features or body express the same emotions in several distinct races of man, we may infer with much probability, that such expressions are true ones,—that is, are innate or instinctive. Conventional expressions or gestures, acquired by the individual during early life, would probably have differed in the different races, in the same manner as do their languages. Accordingly I circulated, early in the year 1867, the following printed queries with a request, which has been fully responded to, that actual observations, and not memory, might be trusted. These queries were written after a considerable interval of time, during which my attention had been otherwise directed, and I can now see that they might have been greatly improved. To some of the later copies, I appended, in manuscript, a few additional remarks:—

(1.) Is astonishment expressed by the eyes and mouth being opened wide, and by the eyebrows being raised?

(2.) Does shame excite a blush when the colour of the skin allows it to be visible? and especially how low down the body does the blush extend?

[19] See remarks to this effect in Lessing's 'Laocoon,' translated by W. Ross, 1836, p. 19.

(3.) When a man is indignant or defiant does he frown, hold his body and head erect, square his shoulders and clench his fists?

(4.) When considering deeply on any subject, or trying to understand any puzzle, does he frown, or wrinkle the skin beneath the lower eyelids?

(5.) 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.

(6.) When in good spirits do the eyes sparkle, with the skin a little wrinkled round and under them, and with the mouth a little drawn back at the corners?

(7.) When a man sneers or snarls at another, is the corner of the upper lip over the canine or eye tooth raised on the side facing the man whom he addresses?

(8.) Can a dogged or obstinate expression be recognized, which is chiefly shown by the mouth being firmly closed, a lowering brow and a slight frown?

(9.) Is contempt expressed by a slight protrusion of the lips and by turning up the nose, with a slight expiration?

(10.) Is disgust shown by the lower lip being turned down, the upper lip slightly raised, with a sudden expiration, something like incipient vomiting, or like something spit out of the mouth?

(11.) Is extreme fear expressed in the same general manner as with Europeans?

(12.) Is laughter ever carried to such an extreme as to bring tears into the eyes?

(13.) When a man wishes to show that he cannot prevent something being done, or cannot himself do something, does he shrug his shoulders, turn inwards his elbows, extend outwards his hands and open the palms; with the eyebrows raised?

(14.) Do the children when sulky, pout or greatly protrude the lips?

(15.) Can guilty, or sly, or jealous expressions be recognized? though I know not how these can be defined.

(16.) Is the head nodded vertically in affirmation, and shaken laterally in negation?

Observations on natives who have had little communication with Europeans would be of course the most valuable, though those made on any natives would be of much interest to me. General remarks on expression are of comparatively little value; and memory is so deceptive that I earnestly beg it may not be trusted. A definite description of the countenance under any emotion or frame of mind, with a statement of the circumstances under which it occurred, would possess much value.

To these queries I have received thirty-six answers from different observers, several of them missionaries or protectors of the aborigines, to all of whom I am deeply indebted for the great trouble which they have taken, and for the valuable aid thus received. I will specify their names, &c., towards the close of this chapter, so as not to interrupt my present remarks. The answers relate to several of the most distinct and savage races of man. In many instances, the circumstances have been recorded under which each expression was observed, and the expression itself described. In such cases, much confidence may be placed in the answers. When the answers have been simply yes or no, I have always received them with caution. It follows, from the information thus acquired, that the same state of mind is expressed throughout the world with remarkable uniformity; and this fact is in itself interesting, as evidence of the close similarity in bodily structure and mental disposition of all the races of mankind.

Sixthly, and lastly, I have attended, as closely as I could, to the expression of the several passions in some of the commoner animals; and this I believe to be of paramount importance, not of course for deciding how far in man certain expressions are characteristic of certain states of mind, but as affording the safest basis for generalisation on the causes, or origin, of the various movements of Expression. In observing animals, we are not so likely to be biassed by our imagination; and we may feel safe that their expressions are not conventional.

From the reasons above assigned, namely, the fleeting nature of some expressions (the changes in the features being often extremely slight); our sympathy being easily aroused when we behold any strong emotion,

and our attention thus distracted; our imagination deceiving us, from knowing in a vague manner what to expect, though certainly few of us know what the exact changes in the countenance are; and lastly, even our long familiarity with the subject,—from all these causes combined, the observation of Expression is by no means easy, as many persons, whom I have asked to observe certain points, have soon discovered. Hence it is difficult to determine, with certainty, what are the movements of the features and of the body, which commonly characterize certain states of the mind. Nevertheless, some of the doubts and difficulties have, as I hope, been cleared away by the observation of infants,—of the insane,—of the different races of man,—of works of art,—and lastly, of the facial muscles under the action of galvanism, as effected by Dr. Duchenne.

But there remains the much greater difficulty of understanding the cause or origin of the several expressions, and of judging whether any theoretical explanation is trustworthy. Besides, judging as well as we can by our reason, without the aid of any rules, which of two or more explanations is the most satisfactory, or are quite unsatisfactory, I see only one way of testing our conclusions. This is to observe whether the same principle by which one expression can, as it appears, be explained, is applicable in other allied cases; and especially, whether the same general principles can be applied with satisfactory results, both to man and the lower animals. This latter method, I am inclined to think, is the most serviceable of all. The difficulty of judging of the truth of any theoretical explanation, and of testing it by some distinct line of investigation, is the great drawback to that interest which the study seems well fitted to excite.

Finally, with respect to my own observations, I may state that they were commenced in the year 1838; and, from that time to the present day, I have occasionally attended to the subject. At the above date, I was already inclined to believe in the principle of evolution, or of the derivation of species from other and lower forms. Consequently, when I read Sir C. Bell's great work, his view, that man had been created with certain muscles specially adapted for the expression of his feelings, struck me as unsatisfactory. It seemed probable that the habit of expressing our feelings by certain movements, though now rendered innate, had been in some manner gradually acquired. But to discover how such habits had been acquired was perplexing in no small degree. The whole subject had to be viewed under a new aspect, and each expression demanded a rational explanation. This belief led me to attempt the present work, however imperfectly it may have been executed.

I will now give the names of the gentlemen to whom, as I have said, I am deeply indebted for information in regard to the expressions exhibited by various races of man, and I will specify some of the circumstances under which the observations were in each case made. Owing to the great kindness and powerful influence of Mr. Wilson, of Hayes Place, Kent, I have received from Australia no less than thirteen sets of answers to my queries. This has been particularly fortunate, as the Australian aborigines rank amongst the most distinct of all the races of man. It will be seen that the observations have been chiefly made in the south, in the outlying parts of the colony of Victoria; but some excellent answers have been received from the north.

Mr. Dyson Lacy has given me in detail some valuable observations, made several hundred miles in the interior of Queensland. To Mr. R. Brough Smyth, of Melbourne, I am much indebted for observations made by himself, and for sending me several of the following letters, namely:—From the Rev. Mr. Hagenauer, of Lake Wellington, a missionary in Gippsland, Victoria, who has had much experience with the natives. From Mr. Samuel Wilson, a landowner, residing at Langerenong, Wimmera, Victoria. From the Rev. George Taplin, superintendent of the native Industrial Settlement at Port Macleay. From Mr. Archibald G. Lang, of Coranderik, Victoria, a teacher at a school where aborigines, old and young, are collected from all parts of the colony. From Mr. H. B. Lane, of Belfast, Victoria, a police magistrate and warden, whose observations, as I am assured, are highly trustworthy. From Mr. Templeton Bunnett, of Echuca, whose station is on the borders of the colony of Victoria, and who has thus been able to observe many aborigines who have had little intercourse with white men. He compared his observations with those made by two other gentlemen long resident in the neighbourhood. Also from Mr. J. Bulmer, a missionary in a remote part of Gippsland, Victoria.

I am also indebted to the distinguished botanist, Dr. Ferdinand Müller, of Victoria, for some observations made by himself, and for sending me others made by Mrs. Green, as well as for some of the foregoing letters.

In regard to the Maoris of New Zealand, the Rev. J. W. Stack has answered only a few of my queries; but the answers have been remarkably full, clear, and distinct, with the circumstances recorded under which the observations were made.

The Rajah Brooke has given me some information with respect to the Dyaks of Borneo.

Respecting the Malays, I have been highly successful; for Mr. F. Geach (to whom I was introduced by Mr. Wallace), during his residence as a mining engineer in the interior of Malacca, observed many natives, who had never before associated with white men. He wrote me two long letters with admirable and detailed observations on their expression. He likewise observed the Chinese immigrants in the Malay archipelago.

The well-known naturalist, H.M. Consul, Mr. Swinhoe, also observed for me the Chinese in their native country; and he made inquiries from others whom he could trust.

In India Mr. H. Erskine, whilst residing in his official capacity in the Admednugur District in the Bombay Presidency, attended to the expression of the inhabitants, but found much difficulty in arriving at any safe conclusions, owing to their habitual concealment of all emotions in the presence of Europeans. He also obtained information for me from Mr. West, the Judge in Canara, and he consulted some intelligent native gentlemen on certain points. In Calcutta Mr. J. Scott, curator of the Botanic Gardens, carefully observed the various tribes of men therein employed during a considerable period, and no one has sent me such full and valuable details. The habit of accurate observation, gained by his botanical studies, has been brought to bear on our present subject. For Ceylon I am much indebted to the Rev. S. O. Glenie for answers to some of my queries.

Turning to Africa, I have been unfortunate with respect to the negroes, though Mr. Winwood Reade aided me as far as lay in his power. It would have been comparatively easy to have obtained information in

regard to the negro slaves in America; but as they have long associated with white men, such observations would have possessed little value. In the southern parts of the continent Mrs. Barber observed the Kafirs and Fingoes, and sent me many distinct answers. Mr. J. P. Mansel Weale also made some observations on the natives, and procured for me a curious document, namely, the opinion, written in English, of Christian Gaika, brother of the Chief Sandilli, on the expressions of his fellow-countrymen. In the northern regions of Africa Captain Speedy, who long resided with the Abyssinians, answered my queries partly from memory and partly from observations made on the son of King Theodore, who was then under his charge. Professor and Mrs. Asa Gray attended to some points in the expressions of the natives, as observed by them whilst ascending the Nile.

On the great American continent Mr. Bridges, a catechist residing with the Fuegians, answered some few questions about their expression, addressed to him many years ago. In the northern half of the continent Dr. Rothrock attended to the expressions of the wild Atnah and Espyox tribes on the Nasse River, in North-Western America. Mr. Washington Matthews, Assistant-Surgeon in the United States Army, also observed with special care (after having seen my queries, as printed in the 'Smithsonian Report') some of the wildest tribes in the Western parts of the United States, namely, the Tetons, Grosventres, Mandans, and Assinaboines; and his answers have proved of the highest value.

Lastly, besides these special sources of information, I have collected some few facts incidentally given in books of travels.

As I shall often have to refer, more especially in the latter part of this volume, to the muscles of the human face, I have had a diagram (fig. 1) copied and reduced from Sir C. Bell's work, and two others, with more accurate details (figs. 2 and 3), from Henle's well-known 'Handbuch der Systematischen Anatomie des Menschen.' The same letters refer to the same muscles in all three figures, but the names are given of only the more important ones to which I shall have to allude. The facial muscles blend much together, and, as I am informed, hardly appear on a dissected face so distinct as they are here represented. Some writers consider that these muscles consist of nineteen pairs, with one unpaired;[20] but others make the number much larger, amounting even to fifty-five, according to Moreau. They are, as is admitted by everyone who has written on the subject, very variable in structure; and Moreau remarks that they are hardly alike in half-a-dozen subjects.[21] They are also variable in function. Thus the power of uncovering the canine tooth on one side differs much in different persons. The power of raising the wings of the nostrils is also, according to Dr. Piderit,[22] variable in a remarkable degree; and other such cases could be given.

Finally, I must have the pleasure of expressing my obligations to Mr. Rejlander for the trouble which he has taken in photographing for me various expressions and gestures. I am also indebted to Herr Kindermann, of Hamburg, for the loan of some excellent negatives of crying infants; and to Dr. Wallich for a charming one

[20] Mr. Partridge in Todd's 'Cyclopædia of Anatomy and Physiology,' vol. ii. p. 227.

[21] 'La Physionomie,' par G. Lavater, tom. iv. 1820, p. 274. On the number of the facial muscles, see vol. iv. pp. 209–211.

[22] 'Mimik und Physiognomik,' 1867, s. 91.

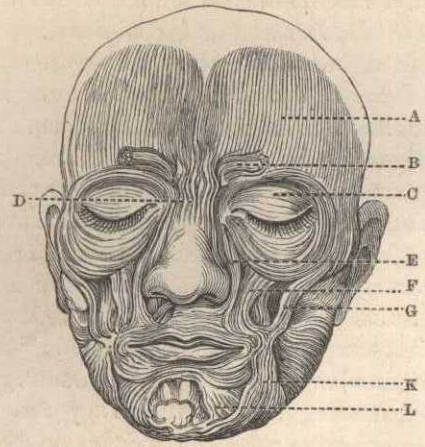

Fig. 1. Diagram of the muscles of the face, from Sir C. Bell.

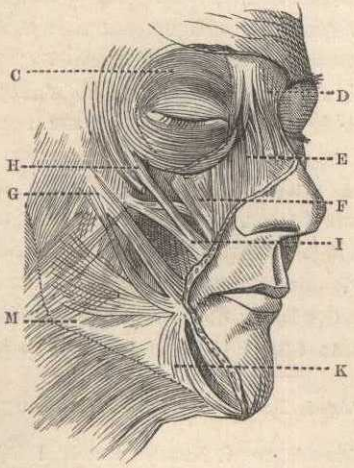

Fig. 2. Diagram from Henle.

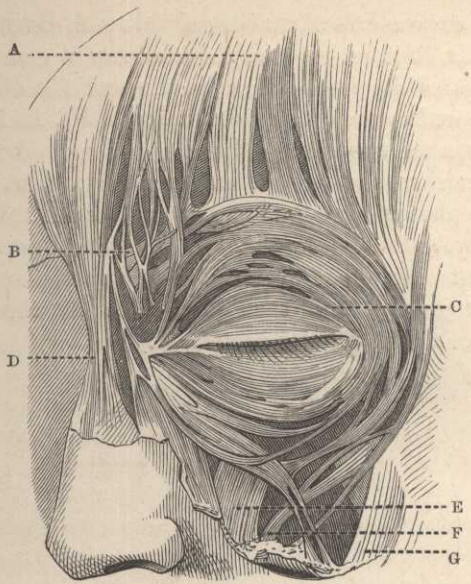

Fig. 3. Diagram from Henle.

A. Occipito-frontalis, or frontal muscle.
B. Corrugator supercilii, or corrugator muscle.
C. Orbicularis palpebrarum, or orbicular muscles of the eyes.
D. Pyramidalis nasi, or pyramidal muscle of the nose.
E. Levator labii superioris alæque nasi.
F. Levator labii proprius.
G. Zygomatic.
H. Malaris.
I. Little zygomatic.
K. Triangularis oris, or depressor anguli oris.
L. Quadratus menti.
M. Risorius, part of the Platysma myoides.

of a smiling girl. I have already expressed my obligations to Dr. Duchenne for generously permitting me to have some of his large photographs copied and reduced. All these photographs have been printed by the Heliotype process, and the accuracy of the copy is thus guaranteed. These plates are referred to by Roman numerals.

I am also greatly indebted to Mr. T. W. Wood for the extreme pains which he has taken in drawing from

life the expressions of various animals. A distinguished artist, Mr. Riviere, has had the kindness to give me two drawings of dogs—one in a hostile and the other in a humble and caressing frame of mind. Mr. A. May has also given me two similar sketches of dogs. Mr. Cooper has taken much care in cutting the blocks. Some of the photographs and drawings, namely, those by Mr. May, and those by Mr. Wolf of the Cynopithecus, were first reproduced by Mr. Cooper on wood by means of photography, and then engraved: by this means almost complete fidelity is ensured.

Fig. 5. Dog approaching another dog with hostile intentions. By Mr. Riviere.

Fig. 6. The same in a humble and affectionate frame of mind. By Mr. Riviere.

Fig. 7. Half-bred Shepherd Dog in the same state as in Fig. 5. By Mr. A. May.

Fig. 8. The same caressing his master. By Mr. A. May.

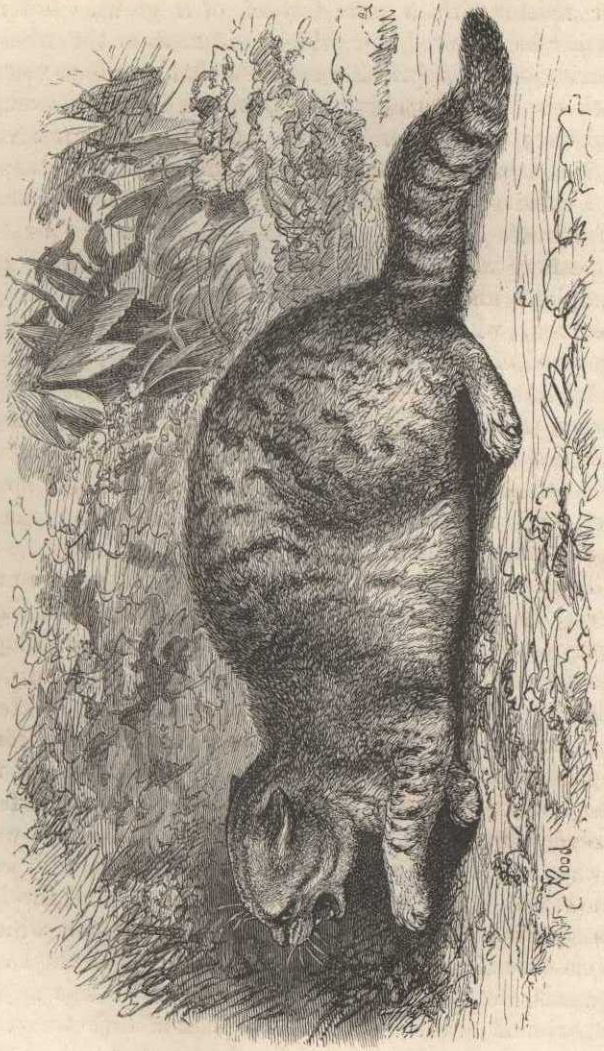

Fig. 9. Cat, savage, and prepared to fight, drawn from life by Mr. Wood.

Fig. 10. Cat in an affectionate frame of mind, by Mr. Wood.

erect their feathers. They open their beaks, and make by paddling little rapid starts forwards, against any one who approaches the water's edge too closely. Tropic birds[13] when disturbed on their nests are said not to fly away, but "merely to stick out "their feathers and scream." The Barn-owl, when ap-

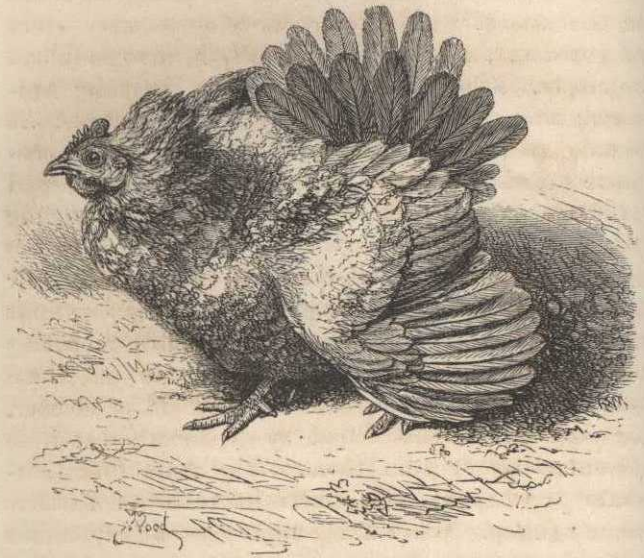

Fig. 12. Hen driving away a dog from her chickens. Drawn from life by Mr. Wood.

proached "instantly swells out its plumage, extends its "wings and tail, hisses and clacks its mandibles with "force and rapidity."[14] So do other kinds of owls. Hawks, as I am informed by Mr. Jenner Weir, likewise ruffle their feathers, and spread out their wings and tail

[13] *Phaeton rubricauda*: 'Ibis,' vol. iii. 1861, p. 180.

[14] On the *Strix flammea*, Audubon, 'Ornithological Biography,' 1864, vol. ii. p. 407. I have observed other cases in the Zoological Gardens.

under similar circumstances. Some kinds of parrots erect their feathers; and I have seen this action in the Cassowary, when angered at the sight of an Anteater. Young cuckoos in the nest, raise their feathers, open their mouths widely, and make themselves as frightful as possible.

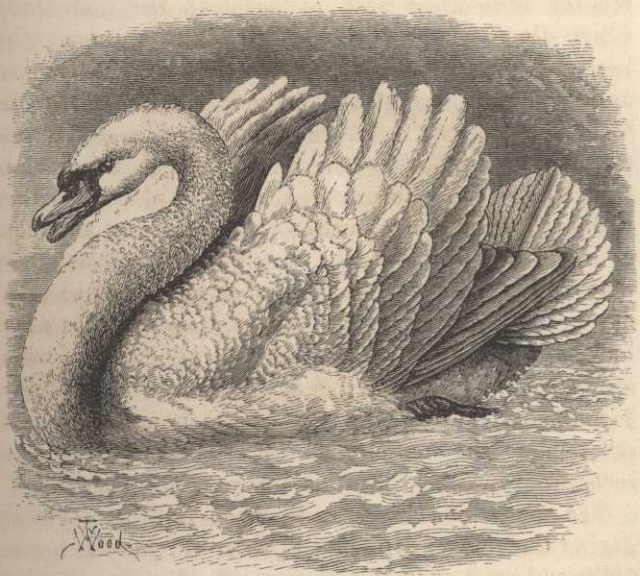

Fig. 13. Swan driving away an intruder. Drawn from life by Mr. Wood.

Small birds, also, as I hear from Mr. Weir, such as various finches, buntings and warblers, when angry, ruffle all their feathers, or only those round the neck; or they spread out their wings and tail-feathers. With their plumage in this state, they rush at each other with open beaks and threatening gestures. Mr. Weir concludes from his large experience that the erection of the feathers is caused much more by anger than by fear. He gives as an instance a hybrid gold-

snarls at another, the lip is generally retracted on one side alone, namely towards his enemy.

The movements of a dog whilst exhibiting affection towards his master were described (figs. 6 and 8) in our second chapter. These consist in the head and

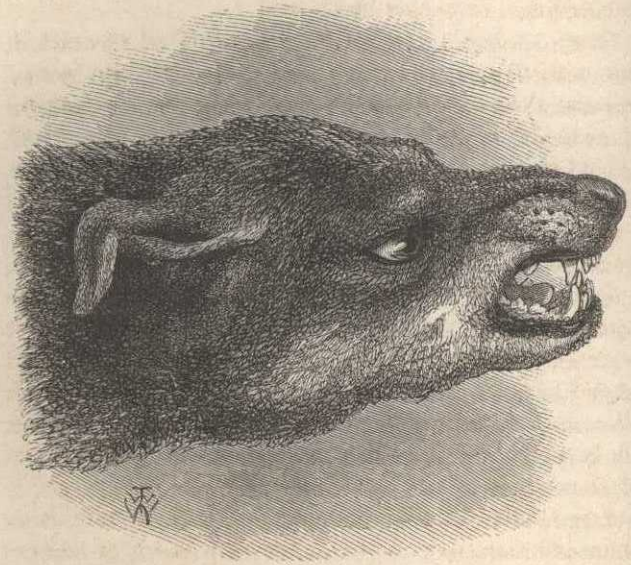

Fig. 14. Head of snarling Dog. From life, by Mr. Wood.

whole body being lowered and thrown into flexuous movements, with the tail extended and wagged from side to side. The ears fall down and are drawn somewhat backwards, which causes the eyelids to be elongated, and alters the whole appearance of the face. The lips hang loosely, and the hair remains smooth. All these movements or gestures are explicable, as I believe, from their standing in complete antithesis to those naturally assumed by a savage dog under a

directly opposite state of mind. When a man merely speaks to, or just notices, his dog, we see the last vestige of these movements in a slight wag of the tail, without any other movement of the body, and without even the ears being lowered. Dogs also exhibit their affection by desiring to rub against their masters, and to be rubbed or patted by them.

Gratiolet explains the above gestures of affection in the following manner: and the reader can judge whether the explanation appears satisfactory. Speaking of animals in general, including the dog, he says,[2] "C'est toujours la partie la plus sensible de leurs corps "qui recherche les caresses ou les donne. Lorsque "toute la longueur des flancs et du corps est sensible, "l'animal serpente et rampe sous les caresses; et ces "ondulations se propageant le long des muscles analo- "gues des segments jusqu'aux extrémités de la colonne "vertébrale, la queue se ploie et s'agite." Further on, he adds, that dogs, when feeling affectionate, lower their ears in order to exclude all sounds, so that their whole attention may be concentrated on the caresses of their master!

Dogs have another and striking way of exhibiting their affection, namely, by licking the hands or faces of their masters. They sometimes lick other dogs, and then it is always their chops. I have also seen dogs licking cats with whom they were friends. This habit probably originated in the females carefully licking their puppies—the dearest object of their love—for the sake of cleansing them. They also often give their puppies, after a short absence, a few cursory licks, apparently from affection. Thus the habit will have become associated with the emotion of love, however it may

[2] 'De la Physionomie,' 1865, pp. 187, 218.

friends, whilst dogs always do so, I cannot say. Cats cleanse themselves by licking their own coats more regularly than do dogs. On the other hand, their tongues seem less well fitted for the work than the longer and more flexible tongues of dogs.

Cats, when terrified, stand at full height, and

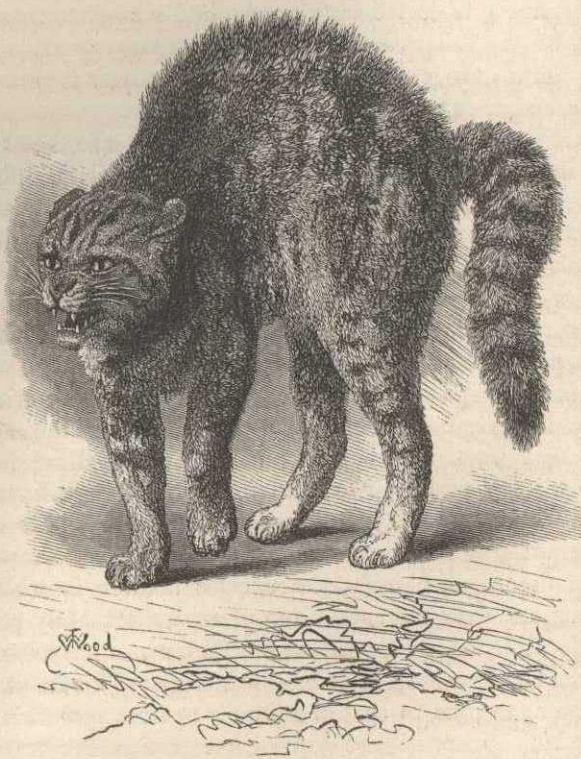

Fig. 15. Cat terrified at a dog. From life, by Mr. Wood.

arch their backs in a well-known and ridiculous fashion. They spit, hiss, or growl. The hair over the

whole body, and especially on the tail, becomes erect. In the instances observed by me the basal part of the tail was held upright, the terminal part being thrown on one side; but sometimes the tail (see fig. 15) is only a little raised, and is bent almost from the base to one side. The ears are drawn back, and the teeth exposed. When two kittens are playing together, the one often thus tries to frighten the other. From what we have seen in former chapters, all the above points of expression are intelligible, except the extreme arching of the back. I am inclined to believe that, in the same manner as many birds, whilst they ruffle their feathers, spread out their wings and tail, to make themselves look as big as possible, so cats stand upright at their full height, arch their backs, often raise the basal part of the tail, and erect their hair, for the same purpose. The lynx, when attacked, is said to arch its back, and is thus figured by Brehm. But the keepers in the Zoological Gardens have never seen any tendency to this action in the larger feline animals, such as tigers, lions, &c.; and these have little cause to be afraid of any other animal.

Cats use their voices much as a means of expression, and they utter, under various emotions and desires, at least six or seven different sounds. The purr of satisfaction, which is made during both inspiration and expiration, is one of the most curious. The puma, cheetah, and ocelot likewise purr; but the tiger, when pleased, "emits a peculiar short snuffle, accompanied by the "closure of the eyelids."[7] It is said that the lion, jaguar, and leopard, do not purr.

Horses.—Horses when savage draw their ears closely

[7] 'Land and Water,' 1867, p. 657. See also Azara on the Puma, in the work above quoted.

Fig. 16. *Cynopithecus niger*, in a placid condition. Drawn from life by Mr. Wolf.

Fig. 17. The same, when pleased by being caressed.

when much distressed and loudly screaming. Rengger states[12] that the eyes of the *Cebus azaræ* fill with tears, but not sufficiently to overflow, when it is prevented getting some much desired object, or is much frightened. Humboldt also asserts that the eyes of the *Callithrix sciureus* "instantly fill with tears when it is "seized with fear;" but when this pretty little monkey in the Zoological Gardens was teased, so as to cry out loudly, this did not occur. I do not, however, wish to throw the least doubt on the accuracy of Humboldt's statement.

The appearance of dejection in young orangs and chimpanzees, when out of health, is as plain and almost as pathetic as in the case of our children. This state of mind and body is shown by their listless movements, fallen countenances, dull eyes, and changed complexion.

Anger.—This emotion is often exhibited by many kinds of monkeys, and is expressed, as Mr. Martin remarks,[13] in many different ways. "Some species, when irritated, pout "the lips, gaze with a fixed and savage glare on their foe, "and make repeated short starts as if about to spring "forward, uttering at the same time inward guttural "sounds. Many display their anger by suddenly ad- "vancing, making abrupt starts, at the same time "opening the mouth and pursing up the lips, so as to "conceal the teeth, while the eyes are daringly fixed "on the enemy, as if in savage defiance. Some again, "and principally the long-tailed monkeys, or Guenons, "display their teeth, and accompany their malicious "grins with a sharp, abrupt, reiterated cry." Mr. Sutton confirms the statement that some species un-

[12] Rengger, ibid. s. 46. Humboldt, 'Personal Narrative,' Eng. translat. vol. iv. p. 527.

[13] Nat. Hist. of Mammalia, 1841, p. 351.

upwards, as if by an incipient smile, though at the time they are not amused or pleased.

A young orang, made jealous by her keeper attending to another monkey, slightly uncovered her teeth, and, uttering a peevish noise like *tish-shist*, turned her back on him. Both orangs and chimpanzees, when a little more angered, protrude their lips greatly, and make a harsh barking noise. A young female chimpanzee, in a violent passion, presented a curious resemblance to a child in the same state. She screamed loudly with widely open mouth, the lips being retracted so that the teeth were fully exposed. She threw her arms wildly about, sometimes clasping them over her head. She rolled on the ground, sometimes on her back, sometimes on her belly, and bit everything within reach. A young gibbon (*Hylobates syndactylus*) in a passion has been described[16] as behaving in almost exactly the same manner.

The lips of young orangs and chimpanzees are protruded, sometimes to a wonderful degree, under various circumstances. They act thus, not only when slightly angered, sulky, or disappointed, but when alarmed at anything—in one instance, at the sight of a turtle,[17]—and likewise when pleased. But neither the degree of protrusion nor the shape of the mouth is exactly the same, as I believe, in all cases; and the sounds which are then uttered are different. The accompanying drawing represents a chimpanzee made sulky by an orange having been offered him, and then taken away. A similar protrusion or pouting of the lips, though to a much slighter degree, may be seen in sulky children.

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[16] G. Bennett, 'Wanderings in New South Wales,' &c. vol. ii. 1834, p. 133.

[17] W. C. Martin, Nat. Hist. of Mamm. Animals, 1841, p, 405.

Fig. 18. Chimpanzee disappointed and sulky. Drawn from life by Mr. Wood.

which slope backwards, are raised in opposite directions by the contraction of the occipito-frontalis or scalp muscle. So that this muscle seems to aid in the erection of the hairs on the head of man, in the same manner as the homologous *panniculus carnosus* aids, or takes the greater part, in the erection of the spines on the backs of some of the lower animals.

Contraction of the platysma myoides muscle.—This muscle is spread over the sides of the neck, extending downwards to a little beneath the collar-bones, and upwards to the lower part of the cheeks. A portion, called the risorius, is represented in the woodcut (M) fig. 2. The contraction of this muscle draws the corners of the mouth and the lower parts of the cheeks downwards and backwards. It produces at the same time divergent, longitudinal, prominent ridges on the sides of the neck in the young; and, in old thin persons, fine transverse wrinkles. This muscle is sometimes said not to be under the control of the will; but almost every one, if told to draw the corners of his mouth backwards and downwards with great force, brings it into action. I have, however, heard of a man who can voluntarily act on it only on one side of his neck.

Sir C. Bell [21] and others have stated that this muscle is strongly contracted under the influence of fear; and Duchenne insists so strongly on its importance in the expression of this emotion, that he calls it the *muscle of fright*.[22] He admits, however, that its contraction is quite inexpressive unless associated with widely open eyes and mouth. He has given a pho-

[21] 'Anatomy of Expression,' p. 168.

[22] Mécanisme de la Phys. Humaine, Album, Légende xi.

tograph (copied and reduced in the accompanying woodcut) of the same old man as on former occasions, with his eyebrows strongly raised, his mouth opened, and the platysma contracted, all by means

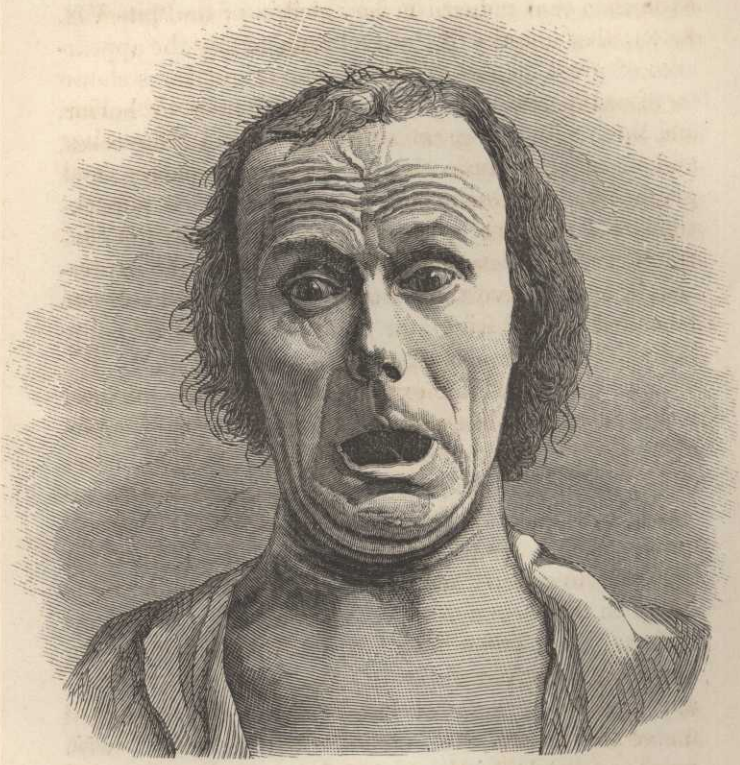

Fig. 20. Terror, from a photograph by Dr. Duchenne.

of galvanism. The original photograph was shown to twenty-four persons, and they were separately asked, without any explanation being given, what expression was intended: twenty instantly answered, "intense

doubt, by the strongly contracted brows, and overlooking the peculiarly opened mouth. One said disgust. On the whole, the evidence indicates that we have here a

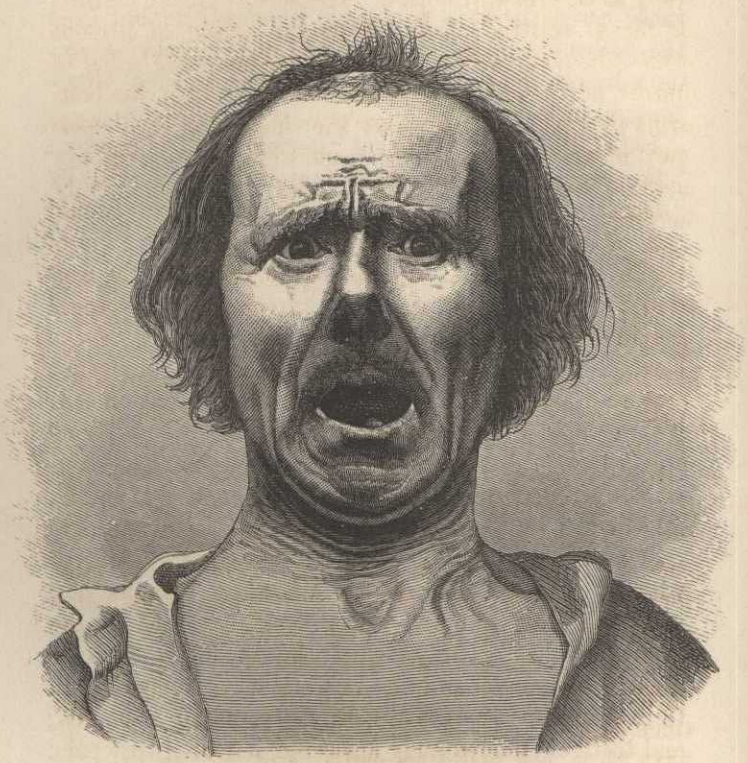

Fig. 21. Horror and Agony, copied from a photograph by Dr. Duchenne.

fairly good representation of horror and agony. The photograph before referred to (Pl. VII. fig. 2) likewise exhibits horror; but in this the oblique eyebrows indicate great mental distress in place of energy.

Horror is generally accompanied by various gestures, which differ in different individuals. Judging from pictures, the whole body is often turned away or shrinks; or the arms are violently protruded as if to push away some dreadful object. The most frequent gesture, as far as can be inferred from the acting of persons who endeavour to express a vividly-imagined scene of horror, is the raising of both shoulders, with the bent arms pressed closely against the sides or chest. These movements are nearly the same with those commonly made when we feel very cold; and they are generally accompanied by a shudder, as well as by a deep expiration or inspiration, according as the chest happens at the time to be expanded or contracted. The sounds thus made are expressed by words like *uh* or *ugh*.[28] It is not, however, obvious why, when we feel cold or express a sense of horror, we press our bent arms against our bodies, raise our shoulders, and shudder.

Conclusion.—I have now endeavoured to describe the diversified expressions of fear, in its gradations from mere attention to a start of surprise, into extreme terror and horror. Some of the signs may be accounted for through the principles of habit, association, and inheritance,—such as the wide opening of the mouth and eyes, with upraised eyebrows, so as to see as quickly as possible all around us, and to hear distinctly whatever sound may reach our ears. For we have thus habitually prepared ourselves to discover and encounter any danger. Some of the other signs of fear may likewise be accounted for, at least in

[28] See remarks to this effect by Mr. Wedgwood, in the Introduction to his 'Dictionary of English Etymology,' 2nd edit. 1872, p. xxxvii. He shows by intermediate forms that the sounds here referred to have probably given rise to many words, such as *ugly*, *huge*, &c.