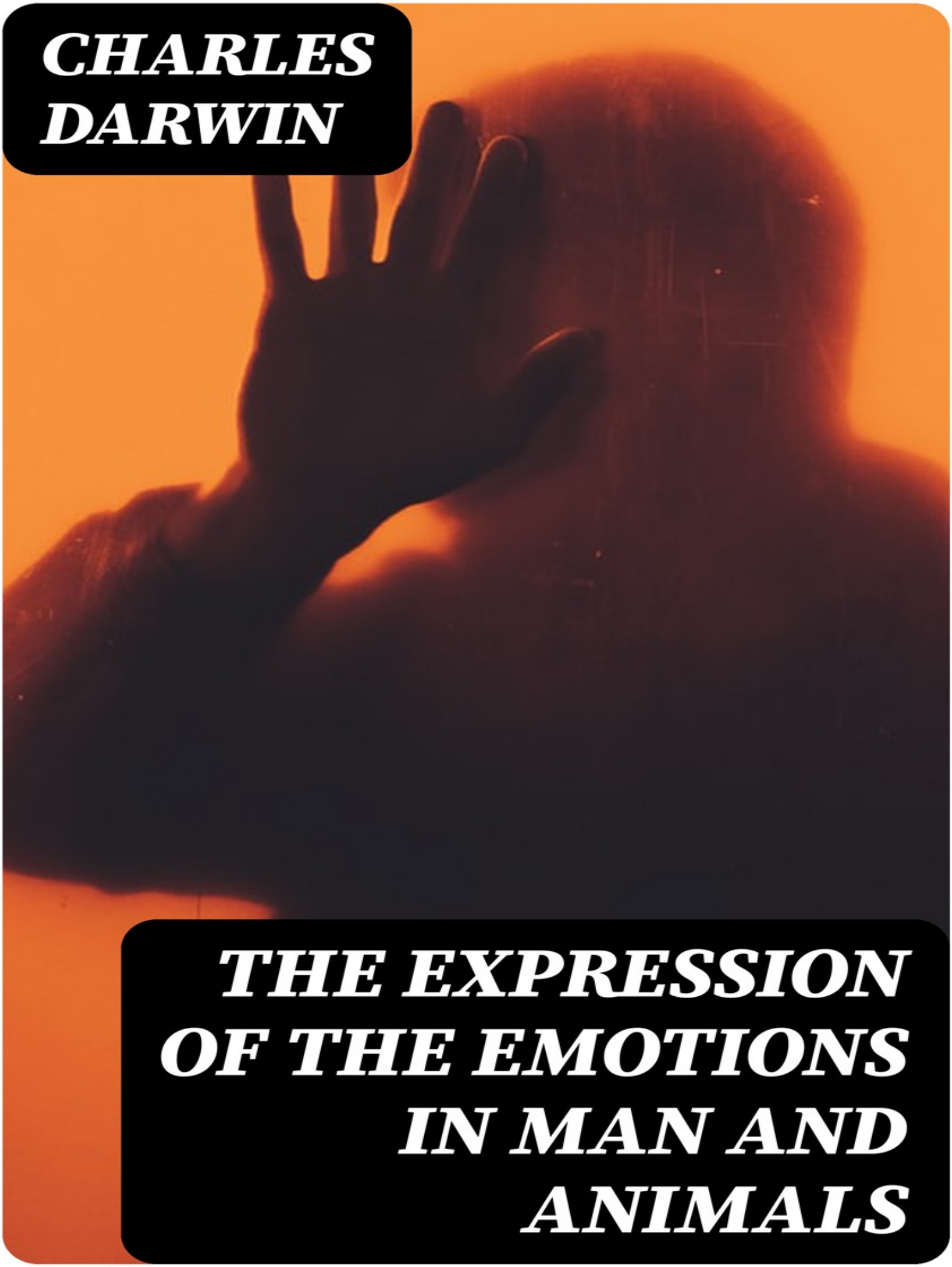
CHARLES DARWIN



THE EXPRESSION OF THE EMOTIONS IN MAN AND ANIMALS

Charles Darwin

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INTRODUCTION.

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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.

Sir Charles Bell, so illustrious for his discoveries in physiology, published in 1806 the first edition, and in 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 Professors 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 monuments 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 French writers the *soucilier* (*corrigator 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 principaux traits de la *face*, comme il convient dans toutes ces passions vraiment oppressives ou profondes, dans ces affections dont le sentiment semble porter l'organisation 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 polir couvrir l’âme 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 foregoing 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 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 sentiment corrélatif, et que ce sentiment se traduit directement, sympathiquement, symboliquement ou métaphoriquement, dans toutes les sphères des organs extérieurs, qui la 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 direction 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, purement symboliques, pouvaient rectifier son trajet? Des mouvements non moins significatifs se produisent quand la bille manque d’une impulsion suffisante. Et cliez les joueurs novices, ils sont quelquefois accusés au point d’éveiller le sourire sur les lèvres des spectateurs.” Such movements, as it appeirs 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 proposition 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 in 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 feeling. I believe it to be a general law of the mind that along with the fact of inward feeling or consciousness, 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 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 external signs of passion, are only the concomitants of those voluntary movements which the structure renders 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 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 expression;” 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 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 plusieurs muscles à la fois, lorsqu’il a voulu que les signes caractéristiques des passions, même les plus 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 immuable, de donner à tout être humain la faculté instinctive d’exprimer toujours ses sendments 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 has 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.

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 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?

(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, and 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.——

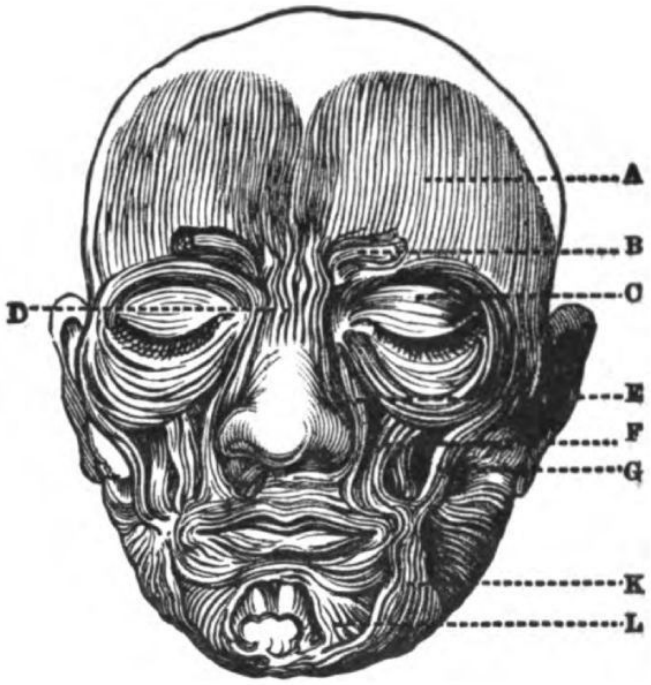

Fig. 1.—Diagram of the muscles of the face, from Sir C. Bell.

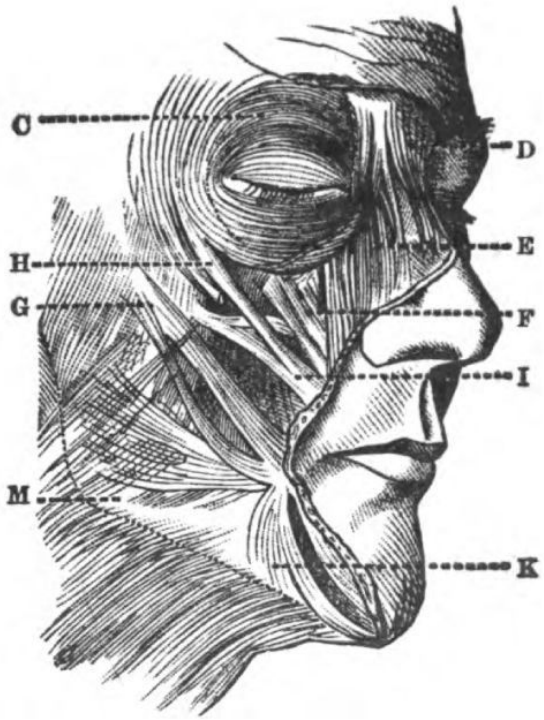

Fig. 2.—Diagram from Henle.

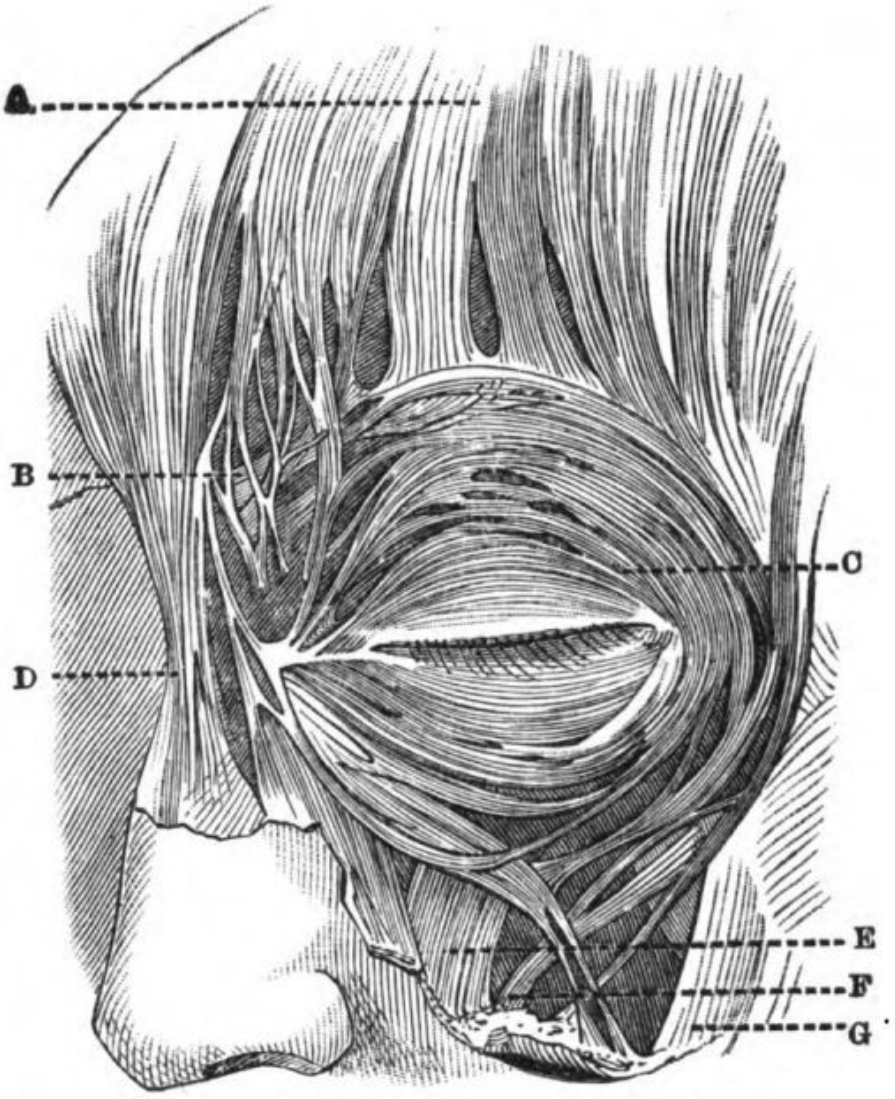

FIG. 8.—Diagram from Henle.

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.

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 Herde'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 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.

CHAPTER I.
GENERAL PRINCIPLES OF EXPRESSION.

Table of Contents

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

I will begin by giving the three Principles, which appear to me to account for most of the expressions and gestures involuntarily used by man and the lower animals, under the influence of various emotions and sensations.[23] I arrived, however, at these three Principles only at the close of my observations. They will be discussed in the present and two following chapters in a general manner. Facts observed both with man and the lower animals will here be made use of; but the latter facts are preferable, as less likely to deceive us. In the fourth and fifth chapters, I will describe the special expressions of some of the lower animals; and in the succeeding chapters those of man. Everyone will thus be able to judge for himself, how far my three principles throw light on the theory of the subject. It appears to me that so many expressions are thus explained in a fairly satisfactory manner, that probably all will hereafter be found to come under the same or closely analogous heads. I need hardly premise that movements or changes in any part of the

body,—as the wagging of a dog’s tail, the drawing back of a horse’s ears, the shrugging of a man’s shoulders, or the dilatation of the capillary vessels of the skin,—may all equally well serve for expression. The three Principles are as follows.

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

II. *The principle of Antithesis*.—Certain states of the mind lead to certain habitual actions, which are of service, as under our first principle. Now 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 these are of no use; and such movements are in some cases highly expressive.

III. *The principle of actions due to the constitution of the Nervous System, independently from the first of the Will, and independently to a certain extent of Habit*.—When the sensorium is strongly excited, nerve-force is generated in excess, and is transmitted in certain definite directions, depending on the connection of the nerve-cells, and partly on habit: or the supply of nerve-force may, as it appears, be interrupted. Effects are thus produced which we recognize as expressive. This third principle may, for the sake of

brevity, be called that of the direct action of the nervous system.

With respect to our *first Principle*, it is notorious how powerful is the force of habit. The most complex and difficult movements can in time be performed without the least effort or consciousness. It is not positively known how it comes that habit is so efficient in facilitating complex movements; but physiologists admit[24] "that the conducting power of the nervous fibres increases with the frequency of their excitement." This applies to the nerves of motion and sensation, as well as to those connected with the act of thinking. That some physical change is produced in the nerve-cells or nerves which are habitually used can hardly be doubted, for otherwise it is impossible to understand how the tendency to certain acquired movements is inherited. That they are inherited we see with horses in certain transmitted paces, such as cantering and ambling, which are not natural to them,—in the pointing of young pointers and the setting of young setters—in the peculiar manner of flight of certain breeds of the pigeon, &c. We have analogous cases with mankind in the inheritance of tricks or unusual gestures, to which we shall presently recur. To those who admit the gradual evolution of species, a most striking instance of the perfection with which the most difficult consensual movements can be transmitted, is afforded by the humming-bird Sphinx-moth (*Macroglossa*); for this moth, shortly after its emergence from the cocoon, as shown by the bloom on its unruffled scales, may be seen poised stationary in the air, with its long hair-like proboscis uncurled and inserted into the minute orifices of flowers; and no one, I believe, has ever seen this moth learning to perform its difficult task, which requires such unerring aim.

When there exists an inherited or instinctive tendency to the performance of an action, or an inherited taste for

certain kinds of food, some degree of habit in the individual is often or generally requisite. We find this in the paces of the horse, and to a certain extent in the pointing of dogs; although some young dogs point excellently the first time they are taken out, yet they often associate the proper inherited attitude with a wrong odour, and even with eyesight. I have heard it asserted that if a calf be allowed to suck its mother only once, it is much more difficult afterwards to rear it by hand.[25] Caterpillars which have been fed on the leaves of one kind of tree, have been known to perish from hunger rather than to eat the leaves of another tree, although this afforded them their proper food, under a state of nature;[26] and so it is in many other cases.

The power of Association is admitted by everyone. Mr. Bain remarks, that "actions, sensations and states of feeling, occurring together or in close succession, tend to grow together, or cohere, in such a way that when any one of them is afterwards presented to the mind, the others are apt to be brought up in idea."[27] It is so important for our purpose fully to recognize that actions readily become associated with other actions and with various states of the mind, that I will give a good many instances, in the first place relating to man, and afterwards to the lower animals. Some of the instances are of a very trifling nature, but they are as good for our purpose as more important habits. It is known to everyone how difficult, or even impossible it is, without repeated trials, to move the limbs in certain opposed directions which have never been practised. Analogous cases occur with sensations, as in the common experiment of rolling a marble beneath the tips of two crossed fingers, when it feels exactly like two marbles. Everyone protects himself when falling to the ground by extending his arms, and as Professor Alison has remarked, few can resist acting thus, when voluntarily falling on a soft bed. A man when going out of doors puts on his gloves quite