

CHAPTER XXV.*

THE EMOTIONS.

IN speaking of the instincts it has been impossible to keep them separate from the emotional excitements which go with them. Objects of rage, love, fear, etc., not only prompt a man to outward deeds, but provoke characteristic alterations in his attitude and visage, and affect his breathing, circulation, and other organic functions in specific ways. When the outward deeds are inhibited, these latter emotional expressions still remain, and we read the anger in the face, though the blow may not be struck, and the fear betrays itself in voice and color, though one may suppress all other sign. *Instinctive reactions and emotional expressions thus shade imperceptibly into each other. Every object that excites an instinct excites an emotion as well.* Emotions, however, fall short of instincts, in that the emotional reaction usually terminates in the subject's own body, whilst the instinctive reaction is apt to go farther and enter into practical relations with the exciting object.

Emotional reactions are often excited by objects with which we have no practical dealings. A ludicrous object, for example, or a beautiful object are not necessarily objects to which we *do* anything; we simply laugh, or stand in admiration, as the case may be. The class of emotional, is thus rather larger than that of instinctive, impulses, commonly so called. Its stimuli are more numerous, and its expressions are more internal and delicate, and often less practical. The physiological plan and essence of the two classes of impulse, however, is the same.

As with instincts, so with emotions, the mere memory or imagination of the object may suffice to liberate the excite-

* Parts of this chapter have already appeared in an article published in 1884 in *Mind*.

ment. One may get angrier in thinking over one's insult than at the moment of receiving it; and we melt more over a mother who is dead than we ever did when she was living. In the rest of the chapter I shall use the word *object* of emotion indifferently to mean one which is physically present or one which is merely thought of.

It would be tedious to go through a complete list of the reactions which characterize the various emotions. For that the special treatises must be referred to. A few examples of their variety, however, ought to find a place here. Let me begin with the manifestations of Grief as a Danish physiologist, C. Lange, describes them: *

"The chief feature in the physiognomy of grief is perhaps its paralyzing effect on the voluntary movements. This effect is by no means as extreme as that which fright produces, being seldom more than that degree of weakening which makes it cost an effort to perform actions usually done with ease. It is, in other words, a feeling of weariness; and (as in all weariness) movements are made slowly, heavily, without strength, unwillingly, and with exertion, and are limited to the fewest possible. By this the grieving person gets his outward stamp: he walks slowly, unsteadily, dragging his feet and hanging his arms. His voice is weak and without resonance, in consequence of the feeble activity of the muscles of expiration and of the larynx. He prefers to sit still, sunk in himself and silent. The tonic or 'latent innervation' of the muscles is strikingly diminished. The neck is bent, the head hangs ('bowed down' with grief), the relaxation of the cheek- and jaw-muscles makes the face look long and narrow, the jaw may even hang open. The eyes appear large, as is always the case where the *orbicularis* muscle is paralyzed, but they may often be partly covered by the upper lid which droops in consequence of the laming of its own *levator*. With this condition of weakness of the voluntary nerve- and muscle-apparatus of the whole body, there coexists, as aforesaid, just as in all states of similar motor weakness, a subjective feeling of weariness and heaviness, of something which weighs upon one; one feels 'downcast,' 'oppressed,' 'laden,' one speaks of his 'weight of sorrow,' one must 'bear up' under it, just as one must 'keep down' his anger. Many there are who 'succumb' to sorrow to such a degree that they literally cannot stand upright, but sink or lean against surrounding objects, fall on their knees, or, like Romeo in the monk's cell, throw themselves upon the earth in their despair.

"But this weakness of the entire voluntary motor apparatus (the so-called apparatus of 'animal' life) is only one side of the physiology of grief. Another side, hardly less important, and in its consequences

* Ueber Gemüthsbewegungen, uebersetzt von H. Kurella (Leipzig, 1887).

perhaps even more so, belongs to another subdivision of the motor apparatus, namely, the involuntary or 'organic' muscles, especially those which are found in the walls of the blood-vessels, and the use of which is, by contracting, to diminish the latter's calibre. These muscles and their nerves, forming together the 'vaso-motor apparatus,' act in grief contrarily to the voluntary motor apparatus. Instead of being paralyzed, like the latter, the vascular muscles are more strongly contracted than usual, so that the tissues and organs of the body become anæmic. The immediate consequence of this bloodlessness is pallor and shrunkenness, and the pale color and collapsed features are the peculiarities which, in connection with the relaxation of the visage, give to the victim of grief his characteristic physiognomy, and often give an impression of emaciation which ensues too rapidly to be possibly due to real disturbance of nutrition, or waste uncompensated by repair. Another regular consequence of the bloodlessness of the skin is a feeling of cold, and shivering. A constant symptom of grief is sensitiveness to cold, and difficulty in keeping warm. In grief, the inner organs are unquestionably anæmic as well as the skin. This is of course not obvious to the eye, but many phenomena prove it. Such is the diminution of the various secretions, at least of such as are accessible to observation. The mouth grows dry, the tongue sticky, and a bitter taste ensues which, it would appear, is only a consequence of the tongue's dryness. [The expression 'bitter sorrow' may possibly arise from this.] In nursing women the milk diminishes or altogether dries up. There is one of the most regular manifestations of grief, which apparently contradicts these other physiological phenomena, and that is the weeping, with its profuse secretion of tears, its swollen reddened face, red eyes, and augmented secretion from the nasal mucous membrane."

Lange goes on to suggest that this may be a reaction from a previously contracted vaso-motor state. The explanation seems a forced one. The fact is that there are changeable expressions of grief. The weeping is as apt as not to be immediate, especially in women and children. Some men can never weep. The tearful and the dry phases alternate in all who can weep, sobbing storms being followed by periods of calm; and the shrunken, cold, and pale condition which Lange describes so well is more characteristic of a severe settled sorrow than of an acute mental pain. Properly we have two distinct emotions here, both prompted by the same object, it is true, but affecting different persons, or the same person at different times, and *feeling* quite differently whilst they last, as anyone's consciousness will testify. There is an excitement during the crying fit which is not without a certain pungent pleasure

of its own; but it would take a genius for felicity to discover any dash of redeeming quality in the feeling of dry and shrunken sorrow.—Our author continues:

“If the smaller vessels of the lungs contract so that these organs become anæmic, we have (as is usual under such conditions) the feeling of insufficient breath, and of oppression of the chest, and these tormenting sensations increase the sufferings of the griever, who seeks relief by long-drawn sighs, instinctively, like every one who lacks breath from whatever cause.*

* The bronchial tubes may be contracted as well as the ramifications of the pulmonary artery. Professor J. Henle has, amongst his *Anthropologische Vorträge*, an exquisite one on the ‘Natural History of the Sigh,’ in which he represents our inspirations as the result of a battle between the red muscles of our skeleton, ribs, and diaphragm, and the white ones of the lungs, which seek to narrow the calibre of the air-tubes. “In the normal state the former easily conquer, but under other conditions they either conquer with difficulty or are defeated. . . . The contrasted emotions express themselves in similarly contrasted wise, by spasm and paralysis of the unstriped muscles, and for the most part alike in all the organs which are provided with them, as arteries, skin, and bronchial tubes. The contrast among the emotions is generally expressed by dividing them into exciting and depressing ones. It is a remarkable fact that the depressing emotions, like fear, horror, disgust, increase the contraction of these smooth muscles, whilst the exciting emotions, like joy, anger, etc., make them relax. Contrasts of temperature act similarly, cold like the depressing, and warmth like the exciting, emotions. Cold produces pallor and goose-flesh, warmth smooths out the skin and widens the vessels. If one notices the uncomfortable mood brought about by strained expectation, anxiety before a public address, vexation at an unmerited affront, etc., one finds that the suffering part of it concentrates itself principally in the chest, and that it consists in a soreness, hardly to be called pain, felt in the middle of the breast and due to an unpleasant resistance which is offered to the movements of inspiration, and sets a limit to their extent. The insufficiency of the diaphragm is obtruded upon consciousness, and we try by the aid of the external voluntary chest-muscles to draw a deeper breath. [This is the sigh.] If we fail, the unpleasantness of the situation is increased, for then to our mental distress is added the corporeally repugnant feeling of lack of air, a slight degree of suffocation. If, on the contrary, the outer muscles overcome the resistance of the inner ones, the oppressed breast is lightened. We think we speak symbolically when we speak of a stone weighing on our heart, or of a burden rolled from off our breast. But really we only express the exact fact, for we should have to raise the entire weight of the atmosphere (about 820 kilog.) at each inspiration, if the air did not balance it by streaming into our lungs.” (P. 55.) It must not be forgotten that an inhibition of the inspiratory centre similar to that produced by exciting the superior laryngeal nerve may possibly play a part in these phenomena. For a very interesting discussion of the respiratory difficulty and its connec-

"The anæmia of the brain in grief is shown by intellectual inertia, dullness, a feeling of mental weariness, effort, and indisposition to work, often by sleeplessness. Indeed it is the anæmia of the motor centres of the brain which lies at the bottom of all that weakening of the voluntary powers of motion which we described in the first instance."

My impression is that Dr. Lange simplifies and universalizes the phenomena a little too much in this description, and in particular that he very likely overdoes the anæmia-business. But such as it is, his account may stand as a favorable specimen of the sort of descriptive work to which the emotions have given rise.

Take next another emotion, Fear, and read what Mr. Darwin says of its effects :

"Fear is often preceded by astonishment, and is so far akin to it that both lead to the senses of sight and hearing being instantly aroused. In both cases the eyes and mouth are widely opened and the eyebrows raised. The frightened man at first stands like a statue, motionless and breathless, or crouches down as if instinctively to escape observation. The heart beats quickly and violently, so that it palpitates or knocks against the ribs ; but it is very doubtful if it then works more efficiently than usual, so as to send a greater supply of blood to all parts of the body ; for the skin instantly becomes pale as during incipient faintness. This paleness of the surface, however, is probably in large part, or is exclusively, due to the vaso-motor centre being affected in such a manner as to cause the contraction of the small arteries of the skin. That the skin is much affected under the sense of great fear, we see in the marvellous manner in which perspiration immediately exudes from it. This exudation is all the more remarkable, as the surface is then cold, and hence the term, a cold sweat ; whereas the sudorific glands are properly excited into action when the surface is heated. The hairs also on the skin stand erect, and the superficial muscles shiver. In connection with the disturbed action of the heart the breathing is hurried. The salivary glands act imperfectly ; the mouth becomes dry and is often opened and shut. I have also noticed that under slight fear there is strong tendency to yawn. One of the best marked symptoms is the trembling of all the muscles of the body ; and this is often first seen in the lips. From this cause, and from the dryness of the mouth, the voice becomes husky or indistinct or may altogether fail. 'Obstupui steteruntque comæ, et vox faucibus hæsit.' . . . As fear increases into an agony of terror, we behold, as under all violent emotions, diversified results. The heart beats wild-

tion with anxiety and fear, see 'A Case of Hydrophobia' by the lamented Thos. B. Curtis in the Boston Med. and Surg. Journal, Nov. 7 and 14, 1878, and remarks thereon by James J. Putnam, *ibid.* Nov. 21.

ly or must fail to act and faintness ensue ; there is a death-like pallor ; the breathing is labored ; the wings of the nostrils are widely dilated ; there is a gasping and convulsive motion of the lips, a tremor on the hollow cheek, a gulping and catching of the throat ; the uncovered and protruding eyeballs are fixed on the object of terror ; or they may roll restlessly from side to side, *huc illuc volens oculos totumque pererrat*. The pupils are said to be enormously dilated. All the muscles of the body may become rigid or may be thrown into convulsive movements. The hands are alternately clenched and opened, often with a twitching movement. The arms may be protruded as if to avert some dreadful danger, or may be thrown wildly over the head. The Rev. Mr. Hagenauer has seen this latter action in a terrified Australian. In other cases there is a sudden and uncontrollable tendency to headlong flight ; and so strong is this that the boldest soldiers may be seized with a sudden panic." *

Finally take Hatred, and read the synopsis of its possible effects as given by Sig. Mantegazza : †

"Withdrawal of the head backwards, withdrawal of the trunk ; projection forwards of the hands, as if to defend one's self against the hated object ; contraction or closure of the eyes ; elevation of the upper lip and closure of the nose,—these are all elementary movements of turning away. Next threatening movements, as : intense frowning ; eyes wide open ; display of teeth ; grinding teeth and contracting jaws ; opened mouth with tongue advanced ; clenched fists ; threatening action of arms ; stamping with the feet ; deep inspirations—panting ; growling and various cries ; automatic repetition of one word or syllable ; sudden weakness and trembling of voice ; spitting. Finally, various miscellaneous reactions and vaso-motor symptoms: general trembling ; convulsions of lips and facial muscles, of limbs and of trunk ; acts of violence to one's self, as biting fist or nails ; sardonic laughter ; bright redness of face ; sudden pallor of face ; extreme dilatation of nostrils ; standing up of hair on head."

Were we to go through the whole list of emotions which have been named by men, and study their organic manifestations, we should but ring the changes on the elements which these three typical cases involve. Rigidity of this muscle, relaxation of that, constriction of arteries here, dilatation there, breathing of this sort or that, pulse slowing or quickening, this gland secreting and that one dry, etc., etc. We should, moreover, find that our descriptions had no

* Origin of the Emotions, Darwin, pp. 290-2.

† La Physionomie et l'Expression des Sentiments (Paris, 1885), p. 140.

absolute truth; that they only applied to the average man; that every one of us, almost, has some personal idiosyncrasy of expression, laughing or sobbing differently from his neighbor, or reddening or growing pale where others do not. We should find a like variation in the objects which excite emotion in different persons. Jokes at which one explodes with laughter nauseate another, and seem blasphemous to a third; and occasions which overwhelm me with fear or bashfulness are just what give you the full sense of ease and power. The internal shadings of emotional feeling, moreover, merge endlessly into each other. Language has discriminated some of them, as hatred, antipathy, animosity, dislike, aversion, malice, spite, vengefulness, abhorrence, etc., etc.; but in the dictionaries of synonyms we find these feelings distinguished more by their severally appropriate objective stimuli than by their conscious or subjective tone.

The result of all this flux is that the merely descriptive literature of the emotions is one of the most tedious parts of psychology. And not only is it tedious, but you feel that its subdivisions are to a great extent either fictitious or unimportant, and that its pretences to accuracy are a sham. But unfortunately there is little psychological writing about the emotions which is not merely descriptive. As emotions are described in novels, they interest us, for we are made to share them. We have grown acquainted with the concrete objects and emergencies which call them forth, and any knowing touch of introspection which may grace the page meets with a quick and feeling response. Confessedly literary works of aphoristic philosophy also flash lights into our emotional life, and give us a fitful delight. But as far as "scientific psychology" of the emotions goes, I may have been surfeited by too much reading of classic works on the subject, but I should as lief read verbal descriptions of the shapes of the rocks on a New Hampshire farm as toil through them again. They give one nowhere a central point of view, or a deductive or generative principle. They distinguish and refine and specify *in infinitum* without ever getting on to another logical level. Whereas the beauty of all truly scientific work

is to get to ever deeper levels. Is there no way out from this level of individual description in the case of the emotions? I believe there is a way out, but I fear that few will take it.

The trouble with the emotions in psychology is that they are regarded too much as absolutely individual things. So long as they are set down as so many eternal and sacred psychic entities, like the old immutable species in natural history, so long all that *can* be done with them is reverently to catalogue their separate characters, points, and effects. But if we regard them as products of more general causes (as 'species' are now regarded as products of heredity and variation), the mere distinguishing and cataloguing becomes of subsidiary importance. Having the goose which lays the golden eggs, the description of each egg already laid is a minor matter. Now the general causes of the emotions are indubitably physiological. Prof. C. Lange, of Copenhagen, in the pamphlet from which I have already quoted, published in 1885 a physiological theory of their constitution and conditioning, which I had already broached the previous year in an article in *Mind*. None of the criticisms which I have heard of it have made me doubt its essential truth. I will therefore devote the next few pages to explaining what it is. I shall limit myself in the first instance to what may be called the *coarser* emotions, grief, fear, rage, love, in which every one recognizes a strong organic reverberation, and afterwards speak of the *subtler* emotions, or of those whose organic reverberation is less obvious and strong.

EMOTION FOLLOWS UPON THE BODILY EXPRESSION IN
THE COARSER EMOTIONS AT LEAST.

Our natural way of thinking about these coarser emotions is that the mental perception of some fact excites the mental affection called the emotion, and that this latter state of mind gives rise to the bodily expression. My theory, on the contrary, is that *the bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur is the emotion*. Common-sense says, we lose our fortune, are sorry and weep; we meet a

bear, are frightened and run; we are insulted by a rival, are angry and strike. The hypothesis here to be defended says that this order of sequence is incorrect, that the one mental state is not immediately induced by the other, that the bodily manifestations must first be interposed between, and that the more rational statement is that we feel sorry because we cry, angry because we strike, afraid because we tremble, and not that we cry, strike, or tremble, because we are sorry, angry, or fearful, as the case may be. Without the bodily states following on the perception, the latter would be purely cognitive in form, pale, colorless, destitute of emotional warmth. We might then see the bear, and judge it best to run, receive the insult and deem it right to strike, but we should not actually *feel* afraid or angry.

Stated in this crude way, the hypothesis is pretty sure to meet with immediate disbelief. And yet neither many nor far-fetched considerations are required to mitigate its paradoxical character, and possibly to produce conviction of its truth.

To begin with, no reader of the last two chapters will be inclined to doubt the fact that *objects do excite bodily changes* by a preorganized mechanism, or the farther fact that *the changes are so indefinitely numerous and subtle that the entire organism may be called a sounding-board*, which every change of consciousness, however slight, may make reverberate. The various permutations and combinations of which these organic activities are susceptible make it abstractly possible that no shade of emotion, however slight, should be without a bodily reverberation as unique, when taken in its totality, as is the mental mood itself. The immense number of parts modified in each emotion is what makes it so difficult for us to reproduce in cold blood the total and integral expression of any one of them. We may catch the trick with the voluntary muscles, but fail with the skin, glands, heart, and other viscera. Just as an artificially imitated sneeze lacks something of the reality, so the attempt to imitate an emotion in the absence of its normal instigating cause is apt to be rather 'hollow.'

The next thing to be noticed is this, that *every one of the*

bodily changes, whatsoever it be, is FELT, acutely or obscurely, the moment it occurs. If the reader has never paid attention to this matter, he will be both interested and astonished to learn how many different local bodily feelings he can detect in himself as characteristic of his various emotional moods. It would be perhaps too much to expect him to arrest the tide of any strong gust of passion for the sake of any such curious analysis as this; but he can observe more tranquil states, and that may be assumed here to be true of the greater which is shown to be true of the less. Our whole cubic capacity is sensibly alive; and each morsel of it contributes its pulsations of feeling, dim or sharp, pleasant, painful, or dubious, to that sense of personality that every one of us unfailingly carries with him. It is surprising what little items give accent to these complexes of sensibility. When worried by any slight trouble, one may find that the focus of one's bodily consciousness is the contraction, often quite inconsiderable, of the eyes and brows. When momentarily embarrassed, it is something in the pharynx that compels either a swallow, a clearing of the throat, or a slight cough; and so on for as many more instances as might be named. Our concern here being with the general view rather than with the details, I will not linger to discuss these, but, assuming the point admitted that every change that occurs must be felt, I will pass on.

I now proceed to urge the vital point of my whole theory, which is this: *If we fancy some strong emotion, and then try to abstract from our consciousness of it all the feelings of its bodily symptoms, we find we have nothing left behind, no 'mind-stuff' out of which the emotion can be constituted, and that a cold and neutral state of intellectual perception is all that remains.* It is true that, although most people when asked say that their introspection verifies this statement, some persist in saying theirs does not. Many cannot be made to understand the question. When you beg them to imagine away every feeling of laughter and of tendency to laugh from their consciousness of the ludicrousness of an object, and then to tell you what the feeling of its ludicrousness would be like, whether it be anything more than the perception that the object belongs to the class 'funny,'

they persist in replying that the thing proposed is a physical impossibility, and that they always *must* laugh if they see a funny object. Of course the task proposed is not the practical one of seeing a ludicrous object and annihilating one's tendency to laugh. It is the purely speculative one of subtracting certain elements of feeling from an emotional state supposed to exist in its fulness, and saying what the residual elements are. I cannot help thinking that all who rightly apprehend this problem will agree with the proposition above laid down. What kind of an emotion of fear would be left if the feeling neither of quickened heart-beats nor of shallow breathing, neither of trembling lips nor of weakened limbs, neither of goose-flesh nor of visceral stirrings, were present, it is quite impossible for me to think. Can one fancy the state of rage and picture no ebullition in the chest, no flushing of the face, no dilatation of the nostrils, no clenching of the teeth, no impulse to vigorous action, but in their stead limp muscles, calm breathing, and a placid face? The present writer, for one, certainly cannot. The rage is as completely evaporated as the sensation of its so-called manifestations, and the only thing that can possibly be supposed to take its place is some cold-blooded and dispassionate judicial sentence, confined entirely to the intellectual realm, to the effect that a certain person or persons merit chastisement for their sins. In like manner of grief: what would it be without its tears, its sobs, its suffocation of the heart, its pang in the breast-bone? A feelingless cognition that certain circumstances are deplorable, and nothing more. Every passion in turn tells the same story. A purely disembodied human emotion is a nonentity. I do not say that it is a contradiction in the nature of things, or that pure spirits are necessarily condemned to cold intellectual lives; but I say that for *us*, emotion dissociated from all bodily feeling is inconceivable. The more closely I scrutinize my states, the more persuaded I become that whatever moods, affections, and passions I have are in very truth constituted by, and made up of, those bodily changes which we ordinarily call their expression or consequence; and the more it seems to me that if I were to become corporeally anæsthetic, I should be ex

cluded from the life of the affections, harsh and tender alike, and drag out an existence of merely cognitive or intellectual form. Such an existence, although it seems to have been the ideal of ancient sages, is too apathetic to be keenly sought after by those born after the revival of the worship of sensibility, a few generations ago.

Let not this view be called materialistic. It is neither more nor less materialistic than any other view which says that our emotions are conditioned by nervous processes. No reader of this book is likely to rebel against such a saying so long as it is expressed in general terms; and if any one still finds materialism in the thesis now defended, that must be because of the special processes invoked. They are *sensational* processes, processes due to inward currents set up by physical happenings. Such processes have, it is true, always been regarded by the platonizers in psychology as having something peculiarly base about them. But our emotions must always be *inwardly* what they are, whatever be the physiological ground of their apparition. If they are deep, pure, worthy, spiritual facts on any conceivable theory of their physiological source, they remain no less deep, pure, spiritual, and worthy of regard on this present sensational theory. They carry their own inner measure of worth with them; and it is just as logical to use the present theory of the emotions for proving that sensational processes need not be vile and material, as to use their vileness and materiality as a proof that such a theory cannot be true.

If such a theory is true, then each emotion is the resultant of a sum of elements, and each element is caused by a physiological process of a sort already well known. The elements are all organic changes, and each of them is the reflex effect of the exciting object. Definite questions now immediately arise—questions very different from those which were the only possible ones without this view. Those were questions of classification: “Which are the proper genera of emotion, and which the species under each?” or of description: “By what expression is each emotion characterized?” The questions now are *causal*: Just what changes does this object and what changes does that object

excite?" and "How come they to excite these particular changes and not others." We step from a superficial to a deep order of inquiry. Classification and description are the lowest stage of science. They sink into the background the moment questions of genesis are formulated, and remain important only so far as they facilitate our answering these. Now the moment the genesis of an emotion is accounted for, as the arousal by an object of a lot of reflex acts which are forthwith felt, *we immediately see why there is no limit to the number of possible different emotions which may exist, and why the emotions of different individuals may vary indefinitely*, both as to their constitution and as to objects which call them forth. For there is nothing sacramental or eternally fixed in reflex action. Any sort of reflex effect is possible, and reflexes actually vary indefinitely, as we know.

"We have all seen men dumb, instead of talkative, with joy; we have seen fright drive the blood into the head of its victim, instead of making him pale; we have seen grief run restlessly about lamenting, instead of sitting bowed down and mute; etc., etc., and this naturally enough, for one and the same cause can work differently on different men's blood-vessels (since these do not always react alike), whilst moreover the impulse on its way through the brain to the vaso-motor centre is differently influenced by different earlier impressions in the form of recollections or associations of ideas."*

In short, *any classification of the emotions is seen to be as true and as 'natural' as any other*, if it only serves some purpose; and such a question as "What is the 'real' or 'typical' expression of anger, or fear?" is seen to have no objective meaning at all. Instead of it we now have the question as to how any given 'expression' of anger or fear may have come to exist; and that is a real question of physiological mechanics on the one hand, and of history on the other, which (like all real questions) is in essence answerable, although the answer may be hard to find. On a later page I shall mention the attempts to answer it which have been made.

DIFFICULTY OF TESTING THE THEORY EXPERIMENTALLY.

I have thus fairly propounded what seems to me the most fruitful way of conceiving of the emotions. It must

* Lange, *op. cit.* p. 75.

be admitted that it is so far only a hypothesis, only *possibly* a true conception, and that much is lacking to its definite proof. The only way coercively to *disprove* it, however, would be to take some emotion, and then exhibit qualities of feeling in it which should be *demonstrably* additional to all those which could possibly be derived from the organs affected at the time. But to detect with certainty such purely spiritual qualities of feeling would obviously be a task beyond human power. We have, as Professor Lange says, absolutely no immediate criterion by which to distinguish between spiritual and corporeal feelings; and, I may add, the more we sharpen our introspection, the more *localized* all our qualities of feeling become (see above, Vol. I. p. 300) and the more difficult the discrimination consequently grows.*

A positive proof of the theory would, on the other hand, be given if we could find a subject absolutely anæsthetic inside and out, but not paralytic, so that emotion-inspiring objects might evoke the usual bodily expressions from him, but who, on being consulted, should say that no subjective emotional affection was felt. Such a man would be like one who, because he eats, appears to bystanders to be hungry, but who afterwards confesses that he had no appetite at all. Cases like this are extremely hard to find. Medical literature contains reports, so far as I know, of but three. In the famous one of Remigius Leins no mention is made by the reporters of his emotional condition. In Dr. G. Winter's case † the patient is said to be inert and phlegmatic, but no particular attention, as I learn from Dr. W., was paid to his psychic condition. In the extraordinary case reported by Professor Strumpell (to which I must refer later in another connection) ‡ we read that the patient, a shoemaker's apprentice of fifteen, entirely anæsthetic, inside

* Professor Höffding, in his excellent treatise on Psychology, admits (p. 342) the mixture of bodily sensation with purely spiritual affection in the emotions. He does not, however, discuss the difficulties of discerning the spiritual affection (nor even show that he has fairly considered them) in his contention that it exists.

† Ein Fall von allgemeiner Anaesthesie (Heidelberg, 1882).

‡ Ziemssen's Deutsches Archiv für klinische Medicin, **xxii.** 321.

and out, with the exception of one eye and one ear, had shown *shame* on the occasion of soiling his bed, and *grief*, when a formerly favorite dish was set before him, at the thought that he could no longer taste its flavor. Dr. Strumpell is also kind enough to inform me that he manifested *surprise*, *fear*, and *anger* on certain occasions. In observing him, however, no such theory as the present one seems to have been thought of; and it always remains possible that, just as he satisfied his natural appetites and necessities in cold blood, with no inward feeling, so his emotional expressions may have been accompanied by a quite cold heart.* Any new case which turns up of generalized anæsthesia ought to be carefully examined as to the inward emotional sensibility as distinct from the 'expressions' of emotion which circumstances may bring forth.

Objections Considered.

Let me now notice a few objections. The replies will make the theory still more plausible.

First Objection. There is no real evidence, it may be said,

* The not very uncommon cases of hysterical hemianæsthesia are not complete enough to be utilized in this inquiry. Moreover, the recent researches, of which some account was given in Chapter IV, tend to show that hysterical anæsthesia is not a real absence of sensibility, but a 'dissociation,' as M. Pierre Janet calls it, or splitting-off of certain sensations from the rest of the person's consciousness, this *rest* forming the self which remains connected with the ordinary organs of expression. The split-off consciousness forms a secondary self; and M. Janet writes me that he sees no reason why sensations whose 'dissociation' from the body of consciousness makes the patient practically anæsthetic, might not, nevertheless, contribute to the emotional life of the patient. They do still contribute to the function of locomotion; for in his patient L. there was no ataxia in spite of the anæsthesia. M. Janet writes me, apropos of his anæsthetic patient L., that she seemed to 'suffer by hallucination.' "I have often pricked or burned her without warning, and when she did not see me. She never moved, and evidently perceived nothing. But if afterwards in her movements she caught sight of her wounded arm, and *saw* on her skin a little drop of blood resulting from a slight cut, she would begin to cry out and lament as if she suffered a great deal. 'My blood flows,' she said one day; 'I *must* be suffering a great deal!' She suffered by hallucination. This sort of suffering is very general in hysterics. It is enough for them to receive the slightest hint of a modification in their body, when their imagination fills up the rest and invents changes that were not felt.' See the remarks published at a later date in Janet's *Automatisme Psychologique*, pp. 214-15.

for the assumption that particular perceptions *do* produce wide-spread bodily effects by a sort of immediate physical influence, antecedent to the arousal of an emotion or emotional idea.

Reply. There is most assuredly such evidence. In listening to poetry, drama, or heroic narrative we are often surprised at the cutaneous shiver which like a sudden wave flows over us, and at the heart-swelling and the lachrymal effusion that unexpectedly catch us at intervals. In listening to music the same is even more strikingly true. If we abruptly see a dark moving form in the woods, our heart stops beating, and we catch our breath instantly and before any articulate idea of danger can arise. If our friend goes near to the edge of a precipice, we get the well-known feeling of 'all-overishness,' and we shrink back, although we positively *know* him to be safe, and have no distinct imagination of his fall. The writer well remembers his astonishment, when a boy of seven or eight, at fainting when he saw a horse bled. The blood was in a bucket, with a stick in it, and, if memory does not deceive him, he stirred it round and saw it drip from the stick with no feeling save that of childish curiosity. Suddenly the world grew black before his eyes, his ears began to buzz, and he knew no more. He had never heard of the sight of blood producing faintness or sickness, and he had so little repugnance to it, and so little apprehension of any other sort of danger from it, that even at that tender age, as he well remembers, he could not help wondering how the mere physical presence of a pailful of crimson fluid could occasion in him such formidable bodily effects.

Professor Lange writes:

"No one has ever thought of separating the emotion produced by an unusually loud sound from the true inward affections. No one hesitates to call it a sort of fright, and it shows the ordinary signs of fright. And yet it is by no means combined with the idea of danger, or in any way occasioned by associations, memories, or other mental processes. The phenomena of fright follow the noise immediately without a trace of 'spiritual' fear. Many men can never grow used to standing beside a cannon when it is fired off, although they perfectly know that there is danger neither for themselves nor for others—the bare sound is too much for them."*

* *Op. cit.* p. 63.

Imagine two steel knife-blades with their keen edges crossing each other at right angles, and moving to and fro. Our whole nervous organization is 'on-edge' at the thought; and yet what emotion can be there except the unpleasant nervous feeling itself, or the dread that more of it may come? The entire fund and capital of the emotion here is the senseless bodily effect which the blades immediately arouse. This case is typical of a class: where an ideal emotion seems to precede the bodily symptoms, it is often nothing but an anticipation of the symptoms themselves. One who has already fainted at the sight of blood may witness the preparations for a surgical operation with uncontrollable heart-sinking and anxiety. He anticipates certain feelings, and the anticipation precipitates their arrival. In cases of morbid terror the subjects often confess that what possesses them seems, more than anything, to be fear of the fear itself. In the various forms of what Professor Bain calls 'tender emotion,' although the appropriate object must usually be directly contemplated before the emotion can be aroused, yet sometimes thinking of the symptoms of the emotion itself may have the same effect. In sentimental natures the thought of 'yearning' will produce real 'yearning.' And, not to speak of coarser examples, a mother's imagination of the caresses she bestows on her child may arouse a spasm of parental longing.

In such cases as these we see plainly how the emotion both begins and ends with what we call its effects or manifestations. It has no mental *status* except as either the vivid feeling of the manifestations, or the idea of them; and the latter thus constitute its entire material, and sum and substance. And these cases ought to make us see how in all cases the feeling of the manifestations may play a much deeper part in the constitution of the emotion than we are wont to suppose.

The best proof that the immediate cause of emotion is a physical effect on the nerves is furnished by *those pathological cases in which the emotion is objectless*. One of the chief merits, in fact, of the view which I propose seems to be that we can so easily formulate by its means patho-

logical cases and normal cases under a common scheme. In every asylum we find examples of absolutely unmotivated fear, anger, melancholy, or conceit; and others of an equally unmotivated apathy which persists in spite of the best of outward reasons why it should give way. In the former cases we must suppose the nervous machinery to be so 'labile' in some one emotional direction that almost every stimulus (however inappropriate) causes it to upset in that way, and to engender the particular complex of feelings of which the psychic body of the emotion consists. Thus, to take one special instance, if inability to draw deep breath, fluttering of the heart, and that peculiar epigastric change felt as 'precordial anxiety,' with an irresistible tendency to take a somewhat crouching attitude and to sit still, and with perhaps other visceral processes not now known, all spontaneously occur together in a certain person; his feeling of their combination is the emotion of dread, and he is the victim of what is known as morbid fear. A friend who has had occasional attacks of this most distressing of all maladies tells me that in his case the whole drama seems to centre about the region of the heart and respiratory apparatus, that his main effort during the attacks is to get control of his inspirations and to slow his heart, and that the moment he attains to breathing deeply and to holding himself erect, the dread, *ipso facto*, seems to depart.*

The emotion here is nothing but the feeling of a bodily state, and it has a purely bodily cause.

* It must be confessed that there are cases of morbid fear in which objectively the heart is not much perturbed. These, however, fail to prove anything against our theory, for it is of course possible that the cortical centres normally percipient of dread as a complex of cardiac and other organic sensations due to real bodily change, should become *primarily* excited in brain-disease, and give rise to an hallucination of the changes being there,—an hallucination of dread, consequently, coexistent with a comparatively calm pulse. etc. I say it is possible, for I am ignorant of observations which might test the fact. Trance, ecstasy, &c., offer analogous examples,—not to speak of ordinary dreaming. Under all these conditions one may have the liveliest subjective feelings, either of eye or ear, or of the more visceral and emotional sort, as a result of pure nerve-central activity, and yet, as I believe, with complete peripheral repose.

"All physicians who have been much engaged in general practice have seen cases of dyspepsia in which constant low spirits and occasional attacks of terror rendered the patient's condition pitiable in the extreme. I have observed these cases often, and have watched them closely, and I have never seen greater suffering of any kind than I have witnessed during these attacks. . . . Thus, a man is suffering from what we call nervous dyspepsia. Some day, we will suppose in the middle of the afternoon, without any warning or visible cause, one of these attacks of terror comes on. The first thing the man feels is great but vague discomfort. Then he notices that his heart is beating much too violently. At the same time shocks or flashes as of electrical discharges, so violent as to be almost painful, pass one after another through his body and limbs. Then in a few minutes he falls into a condition of the most intense fear. He is not afraid of anything; he is simply afraid. His mind is perfectly clear. He looks for a cause of his wretched condition, but sees none. Presently his terror is such that he trembles violently and utters low moans; his body is damp with perspiration; his mouth is perfectly dry; and at this stage there are no tears in his eyes, though his suffering is intense. When the climax of the attack is reached and passed, there is a copious flow of tears, or else a mental condition in which the person weeps upon the least provocation. At this stage a large quantity of pale urine is passed. Then the heart's action becomes again normal, and the attack passes off." *

Again :

"There are outbreaks of rage so groundless and unbridled that all must admit them to be expressions of disease. For the medical layman hardly anything can be more instructive than the observation of such a pathological attack of rage, especially when it presents itself pure and unmixed with other psychical disturbances. This happens in that rather rare disease named transitory mania. The patient predisposed to this—otherwise an entirely reasonable person—will be attacked suddenly without the slightest outward provocation, and thrown (to use the words of the latest writer on the subject, O. Schwartz, *Die transitorische Tobsucht*, Wien, 1880), 'into a paroxysm of the wildest rage, with a fearful and blindly furious impulse to do violence and destroy.' He flies at those about him; strikes, kicks, and throttles whomever he can catch; dashes every object about which he can lay his hands on; breaks and crushes what is near him; tears his clothes; shouts, howls, and roars, with eyes that flash and roll, and shows meanwhile all those symptoms of vaso-motor congestion which we have learned to know as the concomitants of anger. His face is red, swollen, his cheeks hot, his eyes protuberant and their whites bloodshot, the heart beats vio-

*R. M. Bucke: *Man's Moral Nature* (N. Y., 1879), p. 97.

lently, the pulse marks 100-120 strokes a minutes. The arteries of the neck are full and pulsating, the veins are swollen, the saliva flows. The fit lasts only a few hours, and ends suddenly with a sleep of from 8 to 12 hours, on waking from which the patient has entirely forgotten what has happened." *

In these (outwardly) causeless emotional conditions the particular paths which are explosive are discharged by any and every incoming sensation. Just as, when we are seasick, every smell, every taste, every sound, every sight, every movement, every sensible experience whatever, augments our nausea, so the morbid terror or anger is increased by each and every sensation which stirs up the nerve-centres. Absolute quiet is the only treatment for the time. It seems impossible not to admit that in all this the bodily condition takes the lead, and that the mental emotion follows. The *intellect* may, in fact, be so little affected as to play the cold-blooded spectator all the while, and note the absence of a real object for the emotion.†

A few words from Henle may close my reply to this first objection :

"Does it not seem as if the excitations of the bodily nerves met the ideas half way, in order to raise the latter to the height of emotions? [Note how justly this expresses our theory !] That they do so is proved by the cases in which particular nerves, when specially irritable, share in the emotion and determine its quality. When one is suffering from an open wound, any grievous or horrid spectacle will cause pain in the

* Lange, *op. cit.* p. 61.

† I am inclined to think that in some hysteriform conditions of grief, rage, etc., the visceral disturbances are less strong than those which go to outward expression. We have then a tremendous verbal display with a hollow inside. Whilst the bystanders are wrung with compassion, or pale with alarm, the subject all the while lets himself go, but feels his insincerity, and wonders how long he can keep up the performance. The attacks are often surprisingly sudden in their onset. The treatment here is to intimidate the patient by a stronger will. Take out your temper, if he takes out his—"Nay, if thou'lt mouth, I'll rant as well as thou." These are the cases of apparently great bodily manifestation with comparatively little real subjective emotion, which may be used to throw discredit on the theory advanced in the text.—It is probable that the *visceral* manifestations in these cases are quite disproportionately slight, compared with those of the vocal organs. The subject's state is somewhat similar to that of an actor who does not feel his part.

wound. In sufferers from heart-disease there is developed a psychic excitability, which is often incomprehensible to the patients themselves, but which comes from the heart's liability to palpitate. I said that the very quality of the emotion is determined by the organs disposed to participate in it. Just as surely as a dark foreboding, rightly grounded on inference from the constellations, will be accompanied by a feeling of oppression in the chest, so surely will a similar feeling of oppression, when due to disease of the thoracic organs, be accompanied by groundless forebodings. So small a thing as a bubble of air rising from the stomach through the oesophagus, and loitering on its way a few minutes and exerting pressure on the heart, is able during sleep to occasion a nightmare, and during waking to produce a vague anxiety. On the other hand, we see that joyous thoughts dilate our blood-vessels, and that a suitable quantity of wine, because it dilates the vessels, also disposes us to joyous thoughts. If both the jest and the wine work together, they supplement each other in producing the emotional effect, and our demands on the jest are the more modest in proportion as the wine takes upon itself a larger part of the task." *

Second Objection. If our theory be true, a necessary corollary of it ought to be this: that any voluntary and cold-blooded arousal of the so-called manifestations of a special emotion ought to give us the emotion itself. Now this (the objection says) is not found to be the case. An actor can perfectly simulate an emotion and yet be inwardly cold; and we can all pretend to cry and not feel grief; and feign laughter without being amused.

Reply. In the majority of emotions this test is inapplicable; for many of the manifestations are in organs over which we have no voluntary control. Few people in pretending to cry can shed real tears, for example. But, within the limits in which it can be verified, experience corroborates rather than disproves the corollary from our theory, upon which the present objection rests. Every one knows how panic is increased by flight, and how the giving way to the symptoms of grief or anger increases those passions themselves. Each fit of sobbing makes the sorrow more acute, and calls forth another fit stronger still, until at last repose only ensues with lassitude and with the

* *Op. cit.* p. 72.—Lange lays great stress on the neurotic drugs, as parts of his proof that influences of a physical nature upon the body are the first thing in order in the production of emotions.

apparent exhaustion of the machinery. In rage, it is notorious how we 'work ourselves up' to a climax by repeated outbreaks of expression. Refuse to express a passion, and it dies. Count ten before venting your anger, and its occasion seems ridiculous. Whistling to keep up courage is no mere figure of speech. On the other hand, sit all day in a moping posture, sigh, and reply to everything with a dismal voice, and your melancholy lingers. There is no more valuable precept in moral education than this, as all who have experience know: if we wish to conquer undesirable emotional tendencies in ourselves, we must assiduously, and in the first instance cold-bloodedly, go through the *outward movements* of those contrary dispositions which we prefer to cultivate. The reward of persistency will infallibly come, in the fading out of the sullenness or depression, and the advent of real cheerfulness and kindness in their stead. Smooth the brow, brighten the eye, contract the dorsal rather than the ventral aspect of the frame, and speak in a major key, pass the genial compliment, and your heart must be frigid indeed if it do not gradually thaw!

This is recognized by all psychologists, only they fail to see its full import. Professor Bain writes, for example:

"We find that a feeble [emotional] wave . . . is suspended inwardly by being arrested outwardly; the currents of the brain and the agitation of the centres die away if the external vent is resisted at every point. It is by such restraint that we are in the habit of suppressing pity, anger, fear, pride—on many trifling occasions. If so, it is a fact that the suppression of the actual movements has a tendency to suppress the nervous currents that incite them, so that the external quiescence is followed by the internal. The effect would not happen in any case *if there were not some dependence of the cerebral wave upon the free outward vent or manifestation*. . . . By the same interposition we may summon up a dormant feeling. By acting out the external manifestations, we gradually infect the nerves leading to them, and finally waken up the diffusive current by a sort of action *ab extra*. . . . Thus it is that we are sometimes able to assume a cheerful tone of mind by forcing a hilarious expression.*

* Emotions and Will, pp. 361-2.

We have a mass of other testimony of similar effect. Burke, in his treatise on the Sublime and Beautiful, writes as follows of the physiognomist Campanella:

"This man, it seems, had not only made very accurate observations on human faces, but was very expert in mimicking such as were in any way remarkable. When he had a mind to penetrate into the inclinations of those he had to deal with, he composed his face, his gesture, and his whole body, as nearly as he could, into the exact similitude of the person he intended to examine; and then carefully observed what turn of mind he seemed to acquire by the change. So that, says my author, he was able to enter into the dispositions and thoughts of people as effectually as if he had been changed into the very men. I have often observed [Burke now goes on in his own person] that, on mimicking the looks and gestures of angry, or placid, or frightened, or daring men, I have involuntarily found my mind turned to that passion whose appearance I strove to imitate; nay, I am convinced it is hard to avoid it, though one strove to separate the passion from its corresponding gestures."*

Against this it is to be said that many actors who perfectly mimic the outward appearances of emotion in face, gait, and voice declare that they feel no emotion at all. Others, however, according to Mr. Wm. Archer, who has made a very instructive statistical inquiry among them, say that the emotion of the part masters them whenever they play it well.† Thus:

"‘I often turn pale,’ writes Miss Isabel Bateman, ‘in scenes of terror or great excitement. I have been told this many times, and I can feel myself getting very cold and shivering and pale in thrilling situations.’ ‘When I am playing rage or terror,’ writes Mr. Lionel Brough, ‘I believe I do turn pale. My mouth gets dry, my tongue cleaves to my palate. In Bob Acres, for instance (in the last act), I

* Quoted by Dugald Stewart, *Elements*, etc. (Hamilton's ed.), III. 140. Fechner (*Vorschule der Aesthetik*, 156) says almost the same thing of himself: "One may find by one's own observation that the *imitation* of the bodily expression of a mental condition makes us understand it much better than the merely looking on. . . . When I walk behind some one whom I do not know, and imitate as accurately as possible his gait and carriage, I get the most curious impression of feeling as the person himself must feel. To go tripping and mincing after the fashion of a young woman puts one, so to speak, in a feminine mood of mind."

† 'The Anatomy of Acting,' in *Longman's Magazine*, vol. XI. pp. 266, 375, 498 (1888), since republished in book form.

have to continually moisten my mouth, or I shall become inarticulate. I have to "swallow the lump," as I call it.' All artists who have had much experience of emotional parts are absolutely unanimous. . . . 'Playing with the brain,' says Miss Alma Murray, 'is far less fatiguing than playing with the heart. An adventuress taxes the physique far less than a sympathetic heroine. Muscular exertion has comparatively little to do with it.' . . . 'Emotion while acting,' writes Mr. Howe, 'will induce perspiration much more than physical exertion. I always perspired profusely while acting Joseph Surface, which requires little or no exertion.' . . . 'I suffer from fatigue,' writes Mr. Forbes Robertson, 'in proportion to the amount of emotion I may have been called upon to go through, and not from physical exertion.' . . . 'Though I have played Othello,' writes Mr. Coleman, 'ever since I was seventeen (at nineteen I had the honor of acting the Moor to Macready's Iago), husband my resources as I may, this is the one part, the part of parts, which always leaves me physically prostrate. I have never been able to find a pigment that would stay on my face, though I have tried every preparation in existence. Even the titanic Edwin Forrest told me that he was always knocked over in Othello, and I have heard Charles Kean, Phelps, Brooke, Dillion, say the same thing. On the other hand, I have frequently acted Richard III. without turning a hair.' * *

The explanation for the discrepancy amongst actors is probably that which these quotations suggest. The *visceral and organic* part of the expression can be suppressed in some men, but not in others, and on this it is probable that the chief part of the felt emotion depends. Coquelin and the other actors who are inwardly cold are probably able to affect the dissociation in a complete way. Prof. Sikorsky of Kieff has contributed an important article on the facial expression of the insane to the *Neurologisches Centralblatt* for 1887. Having practised facial mimicry himself a great deal, he says :

"When I contract my facial muscles in any mimetic combination, I feel no emotional excitement, so that the mimicry is in the fullest sense of the word artificial, although quite irreproachable from the expressive point of view." †

We find, however, from the context that Prof. S.'s practice before the mirror has developed in him such a virtuosity in the control of his facial muscles that he can entirely disregard their natural association and contract them in any order of grouping, on either side of the face isolatedly,

* P. 394.

† P. 496.

and each one alone. Probably in him the facial mimicry is an entirely restricted and localized thing, without sympathetic changes of any sort elsewhere.

Third Objection. Manifesting an emotion, so far from increasing it, makes it cease. Rage evaporates after a good outburst; it is *pent-up* emotions that "work like madness in the brain."

Reply. The objection fails to discriminate between what is felt *during* and what is felt *after* the manifestation. *During* the manifestation the emotion is always felt. In the normal course of things this, being the natural channel of discharge, exhausts the nerve-centres, and emotional calm ensues. But if tears or anger are simply suppressed, whilst the object of grief or rage remains unchanged before the mind, the current which would have invaded the normal channels turns into others, for it must find some outlet of escape. It may then work different and worse effects later on. Thus vengeful brooding may replace a burst of indignation; a dry heat may consume the frame of one who fain would weep, or he may, as Dante says, turn to stone within; and then tears or a storming fit may bring a grateful relief. This is when the current is strong enough to strike into a pathological path when the normal one is dammed. When this is so, an immediate outpour may be best. But here, to quote Prof. Bain again:

"There is nothing more implied than the fact that an emotion may be too strong to be resisted, and we only waste our strength in the endeavor. If we are really able to stem the torrent, there is no more reason for refraining from the attempt than in the case of weaker feelings. And undoubtedly the *habitual* control of the emotions is not to be attained without a systematic restraint, extended to weak and strong."

When we teach children to repress their emotional talk and display, it is not that they may *feel* more—quite the reverse. It is that they may *think* more; for, to a certain extent, whatever currents are diverted from the regions below, must swell the activity of the thought-tracts of the brain. In apoplexies and other brain injuries we get the opposite condition—an obstruction, namely, to the passage

of currents among the thought-tracts, and with this an increased tendency of objects to start downward currents into the organs of the body. The consequence is tears, laughter, and temper-fits, on the most insignificant provocation, accompanying a proportional feebleness in logical thought and the power of volitional attention and decision,—just the sort of thing from which we try to wean our child. It is true that we say of certain persons that “they would feel more if they expressed less.” And in another class of persons the explosive energy with which passion manifests itself on critical occasions seems correlated with the way in which they bottle it up during the intervals. But these are only eccentric types of character, and within each type the law of the last paragraph prevails. The sentimentalist is so constructed that ‘gushing’ is his or her normal mode of expression. Putting a stopper on the ‘gush’ will only to a limited extent cause more ‘real’ activities to take its place; in the main it will simply produce listlessness. On the other hand, the ponderous and bilious ‘slumbering volcano,’ let him repress the expression of his passions as he will, will find them expire if they get no vent at all; whilst if the rare occasions multiply which he deems worthy of their outbreak, he will find them grow in intensity as life proceeds. On the whole, I cannot see that this third objection carries any weight.

If our hypothesis is true, it makes us realize more deeply than ever how much our mental life is knit up with our corporeal frame, in the strictest sense of the term. Rapture, love, ambition, indignation, and pride, considered as feelings, are fruits of the same soil with the grossest bodily sensations of pleasure and of pain. But the reader will remember that we agreed at the outset to affirm this only of what we then called the ‘coarser’ emotions, and that those inward states of emotional sensibility which appeared devoid at first sight of bodily results should be left out of our account. We must now say a word or two about these latter feelings, the ‘subtler’ emotions, as we then agreed to call them.

THE SUBTLER EMOTIONS.

These are the moral, intellectual, and æsthetic feelings. Concords of sounds, of colors, of lines, logical consistencies, teleological fitnesses, affect us with a pleasure that seems ingrained in the very form of the representation itself, and to borrow nothing from any reverberation surging up from the parts below the brain. The Herbartian psychologists have distinguished feelings due to the *form* in which ideas may be arranged. A mathematical demonstration may be as 'pretty,' and an act of justice as 'neat,' as a drawing or a tune, although the prettiness and neatness seem to have nothing to do with sensation. We have, then, or some of us seem to have, genuinely *cerebral* forms of pleasure and displeasure, apparently not agreeing in their mode of production with the 'coarser' emotions we have been analyzing. And it is certain that readers whom our reasons have hitherto failed to convince will now start up at this admission, and consider that by it we give up our whole case. Since musical perceptions, since logical ideas, can immediately arouse a form of emotional feeling, they will say, is it not more natural to suppose that in the case of the so-called 'coarser' emotions, prompted by other kinds of objects, the emotional feeling is equally immediate, and the bodily expression something that comes later and is added on?

In reply to this we must immediately insist that æsthetic emotion, *pure and simple*, the pleasure given us by certain lines and masses, and combinations of colors and sounds, is an absolutely sensational experience, an optical or auricular feeling that is primary, and not due to the repercussion backwards of other sensations elsewhere consecutively aroused. To this simple primary and immediate pleasure in certain pure sensations and harmonious combinations of them, there may, it is true, be *added* secondary pleasures; and in the practical enjoyment of works of art by the masses of mankind these secondary pleasures play a great part. The more *classic* one's taste is, however, the less relatively important are the secondary pleasures felt to be in comparison with those of the primary sensation as it

comes in.* Classicism and romanticism have their battles over this point. Complex suggestiveness, the awakening of

* Even the feelings of the lower senses may have this secondary escort, due to the arousing of associational trains which reverberate. A flavor may fairly shake us by the ghosts of 'banquet halls deserted,' which it suddenly calls up; or a smell may make us feel almost sick with the waft it brings over our memory of 'gardens that are ruins, and pleasure-houses that are dust.' "In the Pyrenees," says M. Guyau, "after a summer-day's tramp carried to the extreme of fatigue, I met a shepherd and asked him for some milk. He went to fetch from his hut, under which a brook ran, a jar of milk plunged in the water and kept at a coldness which was almost icy. In drinking this fresh milk into which all the mountain had put its perfume, and of which each savory swallow seemed to give new life, I certainly experienced a series of feelings which the word *agreeable* is insufficient to designate. It was like a pastoral symphony, apprehended by the taste instead of by the ear" (quoted by F. Paulhan from 'Les Problèmes de l'Esthétique Contemporaine, p. 63).—Compare the dithyrambic about whiskey of Col. R. Ingersoll, to which the presidential campaign of 1888 gave such notoriety: "I send you some of the most wonderful whiskey that ever drove the skeleton from a feast or painted landscapes in the brain of man. It is the mingled souls of wheat and corn. In it you will find the sunshine and shadow that chase each other over the billowy fields, the breath of June, the carol of the lark, the dews of the night, the wealth of summer, and autumn's rich content—all golden with imprisoned light. Drink it, and you will hear the voice of men and maidens singing the 'Harvest Home,' mingled with the laughter of children. Drink it, and you will feel within your blood the star-lit dawns, the dreamy, tawny dusks of many perfect days. For forty years this liquid joy has been within the happy staves of oak, longing to touch the lips of man."—It is in this way that I should reply to Mr. Gurney's criticism on my theory. My "view," this writer says (*Mind*, ix. 425), "goes far to confound the two things which in my opinion it is the prime necessity of musical psychology to distinguish—the effect chiefly sensuous of mere streams or masses of finely colored sound, and the distinctive musical emotion to which the *form* of a sequence of sound, its melodic and harmonic individuality, even realized in complete silence, is the vital and essential object. It is with the former of these two very different things that the physical reactions, the stirring of the hair—the tingling and the shiver—are by far most markedly connected. . . . If I may speak of myself, there is plenty of music from which I have received as much emotion in silent representation as when presented by the finest orchestra; but it is with the latter condition that I almost exclusively associate the cutaneous tingling and hair-stirring. But to call my enjoyment of the *form*, of the *note-after-noteness* of a melody a mere critical 'judgment of right' [see below, p. 472] would really be to deny to me the power of expressing a fact of simple and intimate expression in English. It is quintessentially emotion. . . . Now there are hundreds of other bits of music . . . which I judge to be *right* without receiving an iota of the emotion. For purposes of emotion they are to me like geometrical demonstrations or

vistas of memory and association, and the stirring of our flesh with picturesque mystery and gloom, make a work of art *romantic*. The classic taste brands these effects as coarse and tawdry, and prefers the naked beauty of the optical and auditory sensations, unadorned with frippery or foliage. To the romantic mind, on the contrary, the immediate beauty of these sensations seems dry and thin. I am of course not discussing which view is right, but only showing that the discrimination between the primary feeling of beauty, as a pure incoming sensible quality, and the secondary emotions which are grafted thereupon, is one that must be made.

These secondary emotions themselves are assuredly for the most part constituted of other incoming sensations aroused by the diffusive wave of reflex effects which the beautiful object sets up. A glow, a pang in the breast, a shudder, a fulness of the breathing, a flutter of the heart, a shiver down the back, a moistening of the eyes, a stirring in the hypogastrium, and a thousand unnamable symptoms besides, may be felt the moment the beauty *excites* us. And these symptoms also result when we are excited by moral perceptions, as of pathos, magnanimity, or courage. The voice breaks and the sob rises in the struggling chest, or the nostril dilates and the fingers tighten, whilst the heart beats, etc., etc.

As far as *these ingredients* of the subtler emotions go, then, the latter form no exception to our account, but rather an additional illustration thereof. In all cases of intellectual or moral rapture we find that, unless there be coupled a bodily reverberation of some kind with the mere

like acts of integrity performed in Peru." The Beethoven-rightness of which Gurney then goes on to speak, as something different from the Clementi-rightness (even when the respective pieces are only heard in idea), is probably a purely *auditory-sensational* thing. The Clementi-rightness also; only, for reasons impossible to assign, the Clementi form does not give the same sort of purely auditory satisfaction as the Beethoven form, and might better be described perhaps negatively as *non-wrong*, i.e., free from positively unpleasant acoustic quality. In organizations as musical as Mr. Gurney's, purely acoustic form gives so intense a degree of sensible pleasure that the lower bodily reverberation is of no account. But I repeat that I see nothing in the facts which Mr. Gurney cites, to lead one to believe in an emotion divorced from *sensational processes* of any kind.

thought of the object and cognition of its quality; unless we actually laugh at the neatness of the demonstration or witticism; unless we thrill at the case of justice, or tingle at the act of magnanimity; our state of mind can hardly be called emotional at all. It is in fact a mere intellectual perception of how certain things are to be called—neat, right, witty, generous, and the like. Such a judicial state of mind as this is to be classed among awarenesses of truth; it is a *cognitive* act. As a matter of fact, however, the moral and intellectual cognitions hardly ever do exist thus unaccompanied. The bodily sounding-board is at work, as careful introspection will show, far more than we usually suppose. Still, where long familiarity with a certain class of effects, even æsthetic ones, has blunted mere emotional excitability as much as it has sharpened taste and judgment, we do get the intellectual emotion, if such it can be called, pure and undefiled. And the dryness of it, the paleness, the absence of all glow, as it may exist in a thoroughly expert critic's mind, not only shows us what an altogether different thing it is from the 'coarser' emotions we considered first, but makes us suspect that almost the entire difference lies in the fact that the bodily sounding-board, vibrating in the one case, is in the other mute. "Not so very bad" is, in a person of consummate taste, apt to be the highest limit of approving expression. "*Rien ne me choque*" is said to have been Chopin's superlative of praise of new music. A sentimental layman would feel, and ought to feel, horrified, on being admitted into such a critic's mind, to see how cold, how thin, how void of human significance, are the motives for favor or disfavor that there prevail. The capacity to make a nice spot on the wall will outweigh a picture's whole content; a foolish trick of words will preserve a poem; an utterly meaningless fitness of sequence in one musical composition set at naught any amount of 'expressiveness' in another.

I remember seeing an English couple sit for more than an hour on a piercing February day in the Academy at Venice before the celebrated 'Assumption' by Titian; and when I, after being chased from room to room by the cold, concluded to get into the sunshine as fast as possible

and let the pictures go, but before leaving drew reverently near to them to learn with what superior forms of susceptibility they might be endowed, all I overheard was the woman's voice murmuring: "What a *deprecatory* expression her face wears! What self-abnegation! How *unworthy* she feels of the honor she is receiving!" Their honest hearts had been kept warm all the time by a glow of spurious sentiment that would have fairly made old Titian sick. Mr. Ruskin somewhere makes the (for him terrible) admission that religious people as a rule care little for pictures, and that when they do care for them they generally prefer the worst ones to the best. Yes! in every art, in every science, there is the keen perception of certain relations being *right* or not, and there is the emotional flush and thrill consequent thereupon. And these are two things, not one. In the former of them it is that experts and masters are at home. The latter accompaniments are bodily commotions that they may hardly feel, but that may be experienced in their fulness by *crétins* and philistines in whom the critical judgment is at its lowest ebb. The 'marvels' of Science, about which so much edifying popular literature is written, are apt to be 'caviare' to the men in the laboratories. And even divine Philosophy itself, which common mortals consider so 'sublime' an occupation, on account of the vastness of its data and outlook, is too apt to the practical philosopher himself to be but a sharpening and tightening business, a matter of 'points,' of screwing down things, of splitting hairs, and of the 'intent' rather than the 'extent' of conceptions. Very little emotion here!—except the effort of setting the attention fine, and the feeling of ease and relief (mainly in the breathing apparatus) when the inconsistencies are overcome and the thoughts run smoothly for a while. Emotion and cognition seem then parted even in this last retreat; and cerebral processes are almost feelingless, so far as we can judge, until they summon help from parts below.

NO SPECIAL BRAIN-CENTRES FOR EMOTION.

If the neural process underlying emotional consciousness be what I have now sought to prove it, the physi-

ology of the brain becomes a simpler matter than has been hitherto supposed. Sensational, associational, and motor elements are all that the organ need contain. The physiologists who, during the past few years, have been so industriously exploring the brain's functions, have limited their explanations to its cognitive and volitional performances. Dividing the brain into sensory and motor centres, they have found their division to be exactly paralleled by the analysis made by empirical psychology of the perceptive and volitional parts of the mind into their simplest elements. But the emotions have been so ignored in all these researches that one is tempted to suppose that if these investigators were asked for a theory of them in brain-terms, they would have to reply, either that they had as yet bestowed no thought upon the subject, or that they had found it so difficult to make distinct hypotheses that the matter lay among the problems of the future, only to be taken up after the simpler ones of the present should have been definitively solved.

And yet it is even now certain that of two things concerning the emotions, one must be true. Either separate and special centres, affected to them alone, are their brain-seat, or else they correspond to processes occurring in the motor and sensory centres already assigned, or in others like them, not yet known. If the former be the case, we must deny the view that is current, and hold the cortex to be something more than the surface of 'projection' for every sensitive spot and every muscle in the body. If the latter be the case, we must ask whether the emotional *process* in the sensory or motor centre be an altogether peculiar one, or whether it resembles the ordinary perceptive processes of which those centres are already recognized to be the seat. Now if the theory I have defended be true, the latter alternative is all that it demands. Supposing the cortex to contain parts, liable to be excited by changes in each special sense-organ, in each portion of the skin, in each muscle, each joint, and each viscus, and to contain absolutely nothing else, we still have a scheme capable of representing the process of the emotions. An object falls on a sense-organ, affects a cortical part, and is perceived;

or else the latter, excited inwardly, gives rise to an idea of the same object. Quick as a flash, the reflex currents pass down through their preordained channels, alter the condition of muscle, skin, and viscus; and these alterations, perceived, like the original object, in as many portions of the cortex, combine with it in consciousness and transform it from an object-simply-apprehended into an object-emotionally-felt. No new principles have to be invoked, nothing postulated beyond the ordinary reflex circuits, and the local centres admitted in one shape or another by all to exist.

EMOTIONAL DIFFERENCES BETWEEN INDIVIDUALS.

The revivability in memory of the emotions, like that of all the feelings of the lower senses, is very small. We can remember that we underwent grief or rapture, but not just how the grief or rapture felt. This difficult *ideal* revivability is, however, more than compensated in the case of the emotions by a very easy *actual* revivability. That is, we can produce, not remembrances of the old grief or rapture, but new griefs and raptures, by summoning up a lively thought of their exciting cause. The cause is now only an idea, but this idea produces the same organic irradiations, or almost the same, which were produced by its original, so that the emotion is again a reality. We have 'recaptured' it. Shame, love, and anger are particularly liable to be thus revived by ideas of their object. Professor Bain admits * that "in their strict character of emotion proper, they [the emotions] have the minimum of revivability; but being always incorporated with the sensations of the higher senses, they share in the superior revivability of sights and sounds." But he fails to point out that the revived sights and sounds may be *ideal* without ceasing to be distinct; whilst the emotion, to be distinct, must become real again. Prof. Bain seems to forget that an 'ideal emotion' and a real emotion prompted by an ideal object are two very different things.

* In his chapter on 'Ideal Emotion,' to which the reader is referred for farther details on this subject.

An emotional temperament on the one hand, and a lively imagination for objects and circumstances on the other, are thus the conditions, necessary and sufficient, for an abundant emotional life. No matter how emotional the temperament may be, if the imagination be poor, the occasions for touching off the emotional trains will fail to be realized, and the life will be *pro tanto* cold and dry. This is perhaps a reason why it may be better that a man of thought should not have too strong a visualizing power. He is less likely to have his trains of meditation disturbed by emotional interruptions. It will be remembered that Mr. Galton found the members of the Royal Society and of the French Academy of Sciences to be below par in visualizing power. If I may speak of myself, I am far less able to visualize now, at the age of 46, than in my earlier years; and I am strongly inclined to believe that the relative sluggishness of my emotional life at present is quite as much connected with this fact as it is with the invading torpor of hoary old, or with the omnibus-horse routine of settled professional and domestic life. I say this because I occasionally have a flash of the old stronger visual imagery, and I notice that the emotional commentary, so to call it, is then liable to become much more acute than is its present wont. Charcot's patient, whose case is given above on p. 58 ff., complained of his incapacity for emotional feeling after his optical images were gone. His mother's death, which in former times would have wrung his heart, left him quite cold; largely, as he himself suggests, because he could form no definite visual image of the event, and of the effect of the loss on the rest of the family at home.

One final generality about the emotions remains to be noted: *They blunt themselves by repetition more rapidly than any other sort of feeling.* This is due not only to the general law of 'accommodation' to their stimulus which we saw to obtain of all feelings whatever, but to the peculiar fact that the 'diffusive wave' of reflex effects tends always to become more narrow. It seems as if it were essentially meant to be a provisional arrangement, on the basis of which precise and determinate reactions might arise. The more we exercise ourselves at anything, the fewer muscles

we employ; and just so, the oftener we meet an object, the more definitely we think and behave about it; and the less is the organic perturbation to which it gives rise. The first time we saw it we could perhaps neither act nor think at all, and had no reaction but organic perturbation. The emotions of startled surprise, wonder, or curiosity were the result. Now we look on with absolutely no emotion.* This tendency to economy in the nerve-paths through which our sensations and ideas discharge, is the basis of all growth in efficiency, readiness, and skill. Where would the general, the surgeon, the presiding chairman, be, if their nerve-currents kept running down into their viscera, instead of keeping up amid their convolutions? But what they gain for practice by this law, they lose, it must be confessed, for feeling. For the world-worn and experienced man, the sense of pleasure which he gets from the free and powerful flow of thoughts, overcoming obstacles as they arise, is the only compensation for that freshness of the heart which he once enjoyed. This free and powerful flow means that brain-paths of association and memory have more and more organized themselves in him, and that through them the stimulus is drafted off into nerves which lead merely to the writing finger or the speaking tongue.† The trains of *intellectual* association, the memories, the logical relations, may,

* Those feelings which Prof. Bain calls 'emotions of relativity,' excitement of novelty, wonder, rapture of freedom, sense of power, hardly survive any repetition of the experience. But as the text goes on to explain, and as Goethe as quoted by Prof. Höfding says, this is because "the soul is inwardly grown larger without knowing it, and can no longer be filled by that first sensation. The man thinks that he has lost, but really he has gained. What he has lost in rapture, he has gained in inward growth." "It is," as Prof. Höfding himself adds, in a beautiful figure of speech, "with our virgin feelings, as with the first breath drawn by the new-born child, in which the lung expands itself so that it can never be emptied to the same degree again. No later breath can feel just like that first one." On this whole subject of emotional blunting, compare Höfding's *Psychologie*, vi. E., and Bain's *Emotions and Will*, chapter iv. of the first part.

† M. Fr. Paulhan, in a little work full of accurate observations of detail (*Les Phénomènes Affectifs et les Lois de leur Apparition*), seems to me rather to turn the truth upside down by his formula that emotions are due to an inhibition of impulsive tendencies. One kind of emotion, namely, uneasiness, annoyance, distress, does occur when any definite impulsive tendency is checked, and all of M. P.'s illustrations are drawn from this

however, be voluminous in the extreme. Past emotions may be among the things remembered. The more of all these trains an object can set going in us, the richer our cognitive intimacy with it is. This cerebral sense of richness seems itself to be a source of pleasure, possibly even apart from the *euphoria* which from time to time comes up from respiratory organs. If there be such a thing as a purely spiritual emotion, I should be inclined to restrict it to this cerebral sense of abundance and ease, this feeling, as Sir W. Hamilton would call it, of unimpeded and not overstrained activity of thought. Under ordinary conditions, it is a fine and serene but not an excited state of consciousness. In certain intoxications it becomes exciting, and it may be intensely exciting. I can hardly imagine a more frenzied excitement than that which goes with the consciousness of seeing absolute truth, which characterizes the coming to from nitrous-oxide drunkenness. Chloroform, ether, and alcohol all produce this deepening sense of insight into truth; and with all of them it may be a 'strong' emotion; but then there also come with it all sorts of strange bodily feelings and changes in the incoming sensibilities. I cannot see my way to affirming that the emotion is independent of these. I will concede, however, that if its independence is anywhere to be maintained, these theoretic raptures seem the place at which to begin the defence.

THE GENESIS OF THE VARIOUS EMOTIONS.

On a former page (pp. 453-4) I said that two questions, and only two, are important, if we regard the emotions as constituted by feelings due to the diffusive wave.

(1) *What special diffusive effects do the various special objective and subjective experiences excite?* and

(2) *How come they to excite them?*

The works on physiognomy and expression are all of them attempts to answer question 1. As is but natural, the

sort. The other emotions are themselves primary impulsive tendencies, of a diffusive sort (involving, as M. P. rightly says, a *multiplixité des phénomènes*); and just in proportion as more and more of these multiple tendencies are checked, and replaced by some few narrow forms of discharge, does the original emotion tend to disappear.

effects upon the face have received the most careful attention. The reader who wishes details additional to those given above on pp. 443-7 is referred to the works mentioned in the note below.*

As regards question 2, some little progress has of recent years been made in answering it. Two things are certain:

a. The facial muscles of expression are not given us simply for expression's sake;†

b. Each muscle is not affected to some one emotion exclusively, as certain writers have thought.

Some movements of expression can be accounted for as *weakened repetitions of movements which formerly* (when they were stronger) *were of utility to the subject*. Others are similarly weakened repetitions of movements which under other conditions were *physiologically necessary effects*. Of the latter reactions the respiratory disturbances in anger and fear might be taken as examples—organic reminiscences, as it were, reverberations in imagination of the blowings of the man making a series of combative efforts, of the pantings of one in precipitate flight. Such at least is a suggestion made by Mr. Spencer which has found approval. And he also was the first, so far as I know, to suggest that other movements in anger and fear could be explained by the nascent excitation of formerly useful acts.

"To have in a slight degree," he says, "such psychical states as accompany the reception of wounds, and are experienced during flight, is to be in a state of what we call fear. And to have in a slight degree such psychical states as the processes of catching, killing, and eating imply, is to have the desires to catch, kill, and eat. That the propensities to the acts are nothing else than nascent excitations of the

* A list of the older writings on the subject is given in Mantegazza's work, *La Physionomie et l'Expression*, chap. i; others in Darwin's first chapter. Bell's *Anatomy of Expression*, Mosso's *La Paura*, Piderit's *Wissenschaftliches System der Mimik und Physiognomik*, Duchenne's *Mécanisme de la Physionomie Humaine*, are, besides Lange and Darwin, the most useful works with which I am acquainted. Compare also Sully: *Sensation and Intuition*, chap. II.

† One must remember, however, that just in so far forth as sexual selection may have played a part in determining the human organism, selection of expressive faces must have increased the average mobility of the human countenance.

psychical state involved in the acts, is proved by the natural language of the propensities. Fear, when strong, expresses itself in cries, in efforts to escape, in palpitations, in tremblings; and these are just the manifestations that go along with an actual suffering of the evil feared. The destructive passion is shown in a general tension of the muscular system, in gnashing of 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. To such objective evidences every one can add subjective evidences. Every one can testify that the psychical state called fear consists of mental representations of certain painful results; and that the one called anger consists of mental representations of the actions and impressions which would occur while inflicting some kind of pain."*

About fear I shall have more to say presently. Meanwhile the principle of *revival in weakened form of reactions useful in more violent dealings with the object inspiring the emotion*, has found many applications. So slight a symptom as the snarl or sneer, the one-sided uncovering of the upper teeth, is accounted for by Darwin as a survival from the time when our ancestors had large canines, and unfleshed them (as dogs now do) for attack. Similarly the raising of the eyebrows in outward attention, the opening of the mouth in astonishment, come, according to the same author, from the utility of these movements in extreme cases. The raising of the eyebrows goes with the opening of the eye for better vision; the opening of the mouth with the intensest listening, and with the rapid catching of the breath which precedes muscular effort. The distention of the nostrils in anger is interpreted by Spencer as an echo of the way in which our ancestors had to breathe when, during combat, their "mouth was filled up by a part of an antagonist's body that had been seized (!)." The trembling of fear is supposed by Mantegazza to be for the sake of warming the blood (!). The reddening of the face and neck is called by Wundt a compensatory arrangement for relieving the brain of the blood-pressure which the simultaneous excitement of the heart brings with it. The effusion of tears is explained both by this author and by Darwin to be a blood-withdrawing agency of a similar sort. The contraction of the muscles around the eyes, of which the primitive use is to

* Psychol., § 213.

protect those organs from being too much gorged with blood during the screaming fits of infancy, survives in adult life in the shape of the frown, which instantly comes over the brow when anything difficult or displeasing presents itself either to thought or action.

"As the habit of contracting the brows has been followed by infants during innumerable generations, at the commencement of every crying or screaming fit," says Darwin, "it has become firmly associated with the incipient sense of something distressing or disagreeable. Hence, under similar circumstances, it would be apt to be continued during maturity, although never then developed, into a crying fit. Screaming or weeping begins to be voluntarily restrained at an early period of life, whereas frowning is hardly ever restrained at any age."*

The intermittent expirations which constitute laughter have, according to Dr. Hecker, the purpose of counteracting the anæmia of the brain, which he supposes to be brought about by the action of the joyous or comic stimulus upon the vaso-motor nerves.† A smile is the weak vestige of a laugh. The tight closure of the mouth in all effort is useful for retaining the air in the lungs so as to fix the chest and give a firm basis of insertion for the muscles of the flanks. Accordingly, we see the lips compress themselves upon every slight occasion of resolve. The blood-pressure has to be high during the sexual embrace; hence the palpi-

* Weeping in childhood is almost as regular a symptom of anger as it is of grief, which would account (on Darwin's principles) for the frown of anger. Mr. Spencer has an account of the angry frown as having arisen through the survival of the fittest, by its utility in keeping the sun out of one's eyes when engaged in mortal combat (!). (*Principles of Psychology*, II. 546.) Professor Mosso objects to any explanation of the frown by its utility for vision, that it is coupled, during emotional excitement, with a dilatation of the pupil which is very unfavorable for distinct vision, and that this ought to have been weeded out by natural selection, if natural selection had the power to fix the frown (see *La Paura*, chap. IX. § VI). Unfortunately this very able author speaks as if all the emotions affected the pupil in the same way. Fear certainly does make it dilate. But Gratiolet is quoted by Darwin and others as saying that the pupils *contract* in anger. I have made no observations of my own on the point, and Mosso's earlier paper on the pupil (Turin, 1875) I have not seen. I must repeat, with Darwin, that we need more minute observations on this subject.

† *Physiologie u. Psychologie des Lachens und des Komischen* (Berlin, 1873), pp. 13-15.

tations, and hence also the tendency to caressing action, which accompanies tender emotion in its fainter forms. Other examples might be given; but these are quite enough to show the scope of the principle of revival of useful action in weaker form.

Another principle, to which Darwin perhaps hardly does sufficient justice, may be called the principle of *reacting similarly to analogous-feeling stimuli*. There is a whole vocabulary of descriptive adjectives common to impressions belonging to different sensible spheres—experiences of all classes are *sweet*, impressions of all classes *rich* or *solid*, sensations of all classes *sharp*. Wundt and Piderit accordingly explain many of our most expressive reactions upon moral causes as symbolic gustatory movements. As soon as any experience arises which has an affinity with the feeling of sweet, or bitter, or sour, the same movements are executed which would result from the taste in point.* “All the states of mind which language designates by the metaphors bitter, harsh, sweet, combine themselves, therefore, with the corresponding mimetic movements of the mouth.” Certainly the emotions of disgust and satisfaction do express themselves in this mimetic way. Disgust is an incipient regurgitation or retching, limiting its expression often to the grimace of the lips and nose; satisfaction goes with a sucking smile, or tasting motion of the lips. In Mantegazza’s loose if learned work, the attempt is made, much less successfully, to bring in the eye and ear as additional sources of symbolically expressive reaction. The ordinary gesture of negation—among us, moving the head about its axis from side to side—is a reaction originally used by babies to keep disagreeables from getting into their mouth, and may be observed in perfection in any nursery.†

* These movements are explained teleologically, in the first instance, by the efforts which the tongue is forced to make to adapt itself to the better perception or avoidance of the sapid body. (Cf. *Physiol. Psych.*, II. 423.)

† Professor Henle derives the negative wag of the head from an incipient shudder, and remarks how fortunate is the abbreviation, as when a lady declines a partner in the ballroom. The clapping of the hands for applause he explains as a symbolic abridgment of an embrace. The pro-

It is now evoked where the stimulus is only an unwelcome idea. Similarly the nod forward in affirmation is after the analogy of taking food into the mouth. The connection of the expression of moral or social disdain or dislike, especially in women, with movements having a perfectly definite original olfactory function, is too obvious for comment. Winking is the effect of any threatening surprise, not only of what puts the eyes in danger; and a momentary aversion of the eyes is very apt to be one's first symptom of response to an unexpectedly unwelcome proposition.—These may suffice as examples of movements expressive from analogy.

But if certain of our emotional reactions can be explained by the two principles invoked—and the reader will himself have felt how conjectural and fallible in some of the instances the explanation is—there remain many reactions which cannot so be explained at all, and these we must write down for the present as purely idiopathic effects of the stimulus. Amongst them are the effects on the viscera and internal glands, the dryness of the mouth and diarrhoea and nausea of fear, the liver-disturbances which sometimes produce jaundice after excessive rage, the urinary secretion of sanguine excitement, and the bladder-contraction of apprehension, the gaping of expectancy, the 'lump in the throat' of grief, the tickling there and the swallowing of embarrassment, the 'precordial' anxiety of dread, the changes in the pupil, the various sweatings of the skin, cold or hot, local or general, and its flushings, together with other symptoms which probably exist but are too hidden to have been noticed or named. It seems as if even the changes of blood-pressure and heart-beat during emotional excitement might, instead of being teleologically determined, prove to be purely mechanical or physiological outpourings through the easiest drainage-channels—the pneumogastrics and sympathetic nerves happening under ordinary circumstances to be such channels.

trusion of the lips (*der prüfende Zug*) which goes with all sorts of dubious and questioning states of mind is derived by Dr. Piderit from the *tasting* movement which we can see on any one's mouth when deciding whether a wine is good or not.

Mr. Spencer argues that the *smallest* muscles must be such channels; and instances the tail in dogs, cats, and birds, the ears in horses, the crest in parrots, the face and fingers in man, as the first organs to be moved by emotional stimuli.* This principle (if it be one) would apply still more easily to the muscles of the smaller arteries (though not exactly to the heart); whilst the great variability of the circulatory symptoms would also suggest that they are determined by causes into which utility does not enter. The quickening of the heart lends itself, it is true, rather easily to explanation by inherited habit, organic memory of more violent excitement; and Darwin speaks in favor of this view (see his *Expression*, etc., pp. 74-5). But, on the other hand, we have so many cases of reaction which are indisputably pathological, as we may say, and which could never be serviceable or derived from what was serviceable, that I think we should be cautious about pushing our explanations of the varied heart-beat too far in the teleological direction. Trembling, which is found in many excitements besides that of terror, is, *pace* Mr. Spencer and Sig. Mante-gazza, quite pathological. So are terror's other strong symptoms. Professor Mosso, as the total result of his study, writes as follows:

"We have seen that the graver the peril becomes, the more do the reactions which are positively harmful to the animal prevail in number and in efficacy. We already saw that the trembling and the palsy make it incapable of flight or defence; we have also convinced ourselves that in the most decisive moments of danger we are less able to see [or to think] than when we are tranquil. In face of such facts we must admit that the phenomena of fear cannot all be accounted for by 'selection.' Their extreme degrees are morbid phenomena which show an imperfection in the organism. We might almost say that Nature had not been

* *Loc. cit.* § 497. Why a dog's face-muscles are not more mobile than they are Mr. Spencer fails to explain, as also why different stimuli should innervate these small muscles in such different ways, if easy drainage be the only principle involved. Charles Bell accounted for the special part played by the facial muscles in expression by their being *accessory muscles of respiration*, governed by nerves whose origin is close to the respiratory centre in the medulla oblongata. They are an adjuvant of *voice*, and like it their function is *communication*. (See Bell's *Anatomy of Expression*. Appendix by Alexander Shaw.)

able to frame a substance which should be excitable enough to compose the brain and spinal marrow, and yet which should not be so excited by exceptional stimulation as to overstep in its reactions those physiological bounds which are useful to the conservation of the creature." *

Professor Bain, if I mistake not, had long previously commented upon fear in a similar way.

Mr. Darwin accounts for many emotional expressions by what he calls the principle of antithesis. In virtue of this principle, if a certain stimulus prompted a certain set of movements, then a contrary-feeling stimulus would prompt exactly the opposite movements, although these might otherwise have neither utility nor significance. It is in this wise that Darwin explains the expression of impotence, raised eyebrows, and shrugged shoulders, dropped arms and open palms, as being the antithesis of the frowning brow, the thrown-back shoulders, and clenched fists of rage, which is the emotion of power. No doubt a certain number of movements can be formulated under this law; but whether it expresses a *causal* principle is more than doubtful. It has been by most critics considered the least successful of Darwin's speculations on this subject.

To sum up, we see the reason for a few emotional reactions; for others a possible species of reason may be guessed; but others remain for which no plausible reason can even be conceived. These may be reactions which are purely mechanical results of the way in which our nervous centres are framed, reactions which, although permanent in us now, may be called accidental as far as their origin goes. In fact, in an organism as complex as the nervous system there *must* be many such reactions, incidental to others evolved for utility's sake, but which would never themselves have been evolved independently, for any utility they might possess. Sea-sickness, the love of music, of the various intoxicants, nay, the entire æsthetic life of man, shall have to trace to this accidental origin.† It would be foolish to suppose that none of the reactions called emotional could have arisen in this *quasi*-accidental way.

* La Paura, Appendice, p. 295.

† See below, p. 627

This is all I have to say about the emotions. If one should seek to name each particular one of them of which the human heart is the seat, it is plain that the limit to their number would lie in the introspective vocabulary of the seeker, each race of men having found names for some shade of feeling which other races have left undiscriminated. If then we should seek to break the emotions, thus enumerated, into groups, according to their affinities, it is again plain that all sorts of groupings would be possible, according as we chose this character or that as a basis, and that all groupings would be equally real and true. The only question would be, does this grouping or that suit our purpose best? The reader may then class the emotions as he will, as sad or joyous, sthenic or asthenic, natural or acquired, inspired by animate or inanimate things, formal or material, sensuous or ideal, direct or reflective, egoistic or non-egoistic, retrospective, prospective or immediate, organismally or environmentally initiated, or what more besides. All these are divisions which have been actually proposed. Each of them has its merits, and each one brings together some emotions which the others keep apart. For a fuller account, and for other classificatory schemes, I refer to the Appendix to Bain's *Emotions and the Will*, and to Mercier's, Stanley's, and Read's articles on the Emotions, in *Mind*, vols. ix, x, and xi. In vol. ix. p. 421 there is also an article by the lamented Edmund Gurney in criticism of the view which in this chapter I continue to defend.