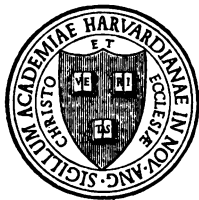




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American Journal of Religious Psychology
and Education

MONOGRAPH SUPPLEMENT

VOL. II. NOVEMBER 1907

THE PSYCHOLOGY
AND NEUROLOGY
OF FEAR

BY

JOSIAH MORSE, PH. D.

AUTHOR OF PATHOLOGICAL ASPECTS OF
RELIGIONS, ETC.

Clark University Press

WORCESTER, MASS.

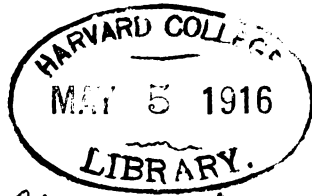
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INTRODUCTORY NOTE.

In this monograph Dr. Morse has sought to epitomize the important special studies of the last decade or two on fear. During this period none of the feelings have been so scientifically studied and that from many sides, neurological, traumatic, esthetic, genetic, medical and pedagogic. None affords so many glimpses into developmental stages of our psychophysical organism; none is quite so tempting to the anthologist who wishes to collect striking peculiarities of psychic life; and as anticipations of pain, none has been more potent in the education of not only men but animals in ways that afford abundant illustrations of Aristotle's definition of education as learning to fear aright. The disrupting effects of shock, with its often long delayed but disastrous effects upon personality, the conception of science as prevision against sudden unforeseen terrors, the weird secret fears that haunt many otherwise sane lives, the increasing number of morbid phobias, the impairment of health by incubating fears and its restitution by their removal, the practical necessity of occasionally appealing to fear in the discipline of children;—all these are pregnant themes that now stand forth in a new light as a result of the recent studies that have so immensely widened our knowledge and helped our control of it. Ever since the publication of my own monograph on the subject¹ I am inclined to think that our knowledge has been more than doubled. At least henceforth every psychology or pedagogy must give this subject a prominent place, and all interested in either of these fields will find valuable aid in this monograph.

G. STANLEY HALL.

Clark University,

November 1, 1907.

¹A Study of Fears. *Amer. Jour. of Psy.*, Jan., 1897, Vol. 8, pp. 147-249.

which are predominantly of a psychical nature, such as intellectual, moral and religious fears, and which are conditioned by internal, intra-cortical excitations, what we may call representative fears. This consideration will bring out what is known of fear in animals and children; the various phenomena, objects and events feared, and morbid fears—phobias and pseudo-phobias. Lastly we shall treat of those emotional states which are closely akin to fear, such as shock, timidity, stage-fright, anxiety, terror, horror, and the like.

I gratefully acknowledge my indebtedness to President G. Stanley Hall who suggested the study and made it possible for me to pursue it.

CHAPTER I.

THEORIES OF THE EMOTIONS.

From the time when our primitive forebears first expressed their states of feeling in words, to the present day, man has employed some such phrase as "I was scared stiff, my hair stood on end and a cold shiver passed up and down my back;" or, as Virgil more eloquently expressed it, *Obstupui steteruntque comae, et vox faucibus haesit*, in order to indicate his feeling of fear. These phrases went unchallenged through the ages until quite recently, when Professor Lange in Denmark and Professor James in America simultaneously objected that we were putting the cart before the horse, that we should properly say, "I was made stiff, my hair stood on end, and cold shivers passed up and down my back. This frightened me." The layman, when he first hears this theory is provoked to laughter and ridicule, but psychologists have taken it more seriously and have either accepted it, or attempted to refute it, giving rise to a considerable literature, some of which we shall briefly review.

Although erroneous, as I shall later attempt to show, the theory is by no means as absurd as it appears at first sight. The love of paradox and a fondness for literary style led Professor James to state his theory in so striking and startling a manner that it would have been strange indeed had it not called forth sharp criticisms from the more conservative and Germanesque members of his guild. However, had he not stated his theory so paradoxically, it is possible that it would have suffered the same fate as Descartes' excellent treatment of the emotions in which he anticipated the James-Lange theory.¹

Let us now see more in detail what this theory is, in what respect it differs from its predecessors, what objections have been raised against it, and what other theories have been offered in its stead.

¹Sur les passions de l'âme.

According to older theories, the chronological order of events in the production of an emotion is: (1) an object, *e. g.*, a spider, a bear, or a loved one is perceived; or an event, *e. g.*, an earthquake, or a hanging, or a breach of etiquette is imagined; or the subject has a train of thought such, for example, as is produced by the reading of a poem or a drama, or gazing on a work of art; (2) these intellectual states immediately give rise to appropriate emotions—fear, horror, disgust, love, sympathy, sadness, or joy; (3) these emotions give rise, according to their quality and intensity to vasomotor disturbances and muscular movements, such as arrest or acceleration of the heart, changes in breathing and circulation, secretion of the glands, flight, trembling, blushing, frowning, movements of defence, etc. The various reactions will be enumerated in a later section. Now the James-Lange hypothesis maintains that the second event in the series comes third and the third, second; that is, that the emotions do not produce the organic states and movements, but are produced by them; indeed without the latter there could be no emotions. To state the matter in Professor James' own words:

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 them, 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 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.¹

Again,

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. 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

¹ Principles of Psychology, vol. 2, pp. 449-450.

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 merited 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 breastbone. 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.¹

Professor James contents himself with the general statement that the emotions are effects of vasomotor and organic changes, without indicating the exact nature of these changes. Professor Lange, being a physiologist, attempts to do this in detail. His theory, briefly stated, is as follows:

1. There is in joy, gaiety, and kindred states, a vaso-dilatation of the small arteries; and in sadness, grief, and kindred states, a vaso-constriction of the small arteries.

2. These vasomotor modifications are the true causes of the states of joy and sadness, not the results of them.

The second point, it is seen, is the same as James' hypothesis; the first, which is of considerable importance for the theory, has been proven false. G. Dumas who performed careful experiments on melancholiacs, general paralytics and those suffering from chronic delirium, all of whom showed well marked states of joy and sadness, found that there could be vaso-constriction in joy as well as in sadness. Neither did the arterial tension present anything characteristic, since it could be strong or weak in both joy and sadness. On the other hand, grief, indignation, and despair when mingled with active pain produced effects similar to those of joy.² Binet and Courtier found that surprise produces almost always a vaso-constriction, and they came to the conclusion after studying various emotions that there is a tendency to constriction, every time a sudden and unexpected excitation is produced, regardless of its quality. Thus, an agreeable or comic surprise produces in the beginning a vaso-constriction, just as a disagreeable one does. In fear they always found vaso-constriction.

¹ *Ibid.*, pp. 451-452.

² *Recherches experimentales sur la joie et la tristesse*, *Revue Philos.*, June, July, Aug., 1896.

tion varying in intensity in different individuals, but they attributed this constriction to the fact that fear is an exciting emotion, vigorously denying what has been stated by so many authors, that fear is a depressing emotion causing, or being caused by a slowing down of the heart and respiration as well as the vaso-constriction.¹ These results agree with those obtained by Mosso, and which shall be given in the next section.

"There is for each subject," write our authors, "a sufficiently constant relationship between the psychical emotional state and the state of the vessels, but this rapport is not the same for all individuals. With some, the state of gaiety, joy, contentment, pleasure, evoked by the imagination and enduring for some time produces an enlargement of the pulsation (a dilatation), while sadness, dejection, anxiety and moral pain produce a lessening of the pulsation (a constriction). But with other subjects precisely the reverse is produced, and this with such a constancy that it cannot be mistaken. We observed for many months a person who showed constantly in his states of voluntarily evoked but really very profound sadness, a considerable amplification of the capillary pulse, while his pulse during a state of gaiety was very small. There are some subjects in whom every emotional state gives rise to vaso-constriction, and others in whom these various states produce no appreciable effect."²

The vaso-constriction is merely a sign, then, that the nervous system has been excited, having no qualitative significance whatever.

In another series of experiments³ these same writers found a few subjects who gave the signal signifying that their emotion was completed before the vaso-constriction began; more often the signal was given during the beginning of the constriction, during the period of descent, and sometimes at the moment when it was at its maximum; always, however, before it was terminated.

These facts refute the most definite and most important part of Lange's theory, namely, that the various emotions are the effects of vaso-dilatations and vaso-constrictions.⁴ The most that we can say is that all strong emotions are exciting, whether they be painful or pleasurable emotions. We certainly cannot say that organic perturbations of a certain sort will always give rise to pleasurable emotions, while perturbations of another sort will always give rise to depressive emotions, nor the reverse, that certain emotions will invariably give rise to definite, specific organic perturbations, or even bodily move-

¹ Binet et Courtier: Influence de la vie émotionnelle sur la coeur, la respiration, etc. *L'Anne Psychologique*, 1896, 3, pp. 65-126.

² *Ibid.*

³ Binet et Courtier: Circulation Capillaire, etc., *L'Anne Psychologique*, 1895, 2, pp. 87-167.

⁴ Ueber Gemüthsbewegungen, Leipzig, 1887.

ments. There is no fixed, constant relationship between the two, so that given one we can infallibly infer the other.

It is not at all uncommon for people to weep from excess of joy as well as of grief. Pallor and trembling are frequent accompaniments of the extremes of hope as well as fear. The naturalist Wallace gives an account of his feelings on capturing a rare and beautiful butterfly, which is worth quoting in this connection: 'The beauty and brilliancy of this insect are indescribable, and none but a naturalist can understand the intense excitement I experienced when I at length captured it. On taking it out of the net and opening the glorious wings, my heart began to beat violently, the blood rushed to my head, and I felt more like fainting than I have done when in prospect of immediate death. I had a headache the rest of the day, so great was the excitement produced by what will appear to most people a very inadequate cause.'¹

This throws us back on the theory as stated in general terms by Professor James, and we shall now note the objections that have been raised against it. The criticism that has most frequently been made is, that while this theory may hold true for the coarser, animal emotions, it does not hold true for the more subtle and human emotions in which, ingredients other than organic changes are more predominant. Ribot, who subscribes to the James-Lange theory with the exception that he would reduce their dualism of psychical emotion and physiological changes to a monism which would entirely eliminate the notion of cause and effect and consider both but different aspects of one and the same thing, — "a single occurrence expressed in two languages" attempts to show that the theory also holds good for the more complex and refined religious, moral, æsthetic, and intellectual sentiments. The religious sentiment, he reminds us, is attached to physiological conditions,

because it is closely connected with the instinct of self-preservation, with the saving of the soul, under whatever form the believer may conceive it. "Does not the believer," he asks, "whatever his degree of culture, whatever his religion, at the moment when he feels the emotion, tremble, turn pale, exhibit the *sacer horror*, the overwhelming awe which may end in unconsciousness, the prostrate attitude?"²

It is evident that Ribot has only the more primitive forms of religious experience in mind, and is apparently unaware of the fact so clearly brought out by the returns gathered by Leuba that there are very many truly religious individuals in cultured society who do not tremble, turn pale, or exhibit the *sacer horror*, who do not pray for blessings, or even have a

¹ Malay Archipelago, p. 342. Quoted by Worcester, *Monist*, 1892-93, p. 290.

²The Psychology of the Emotions, N. Y., 1897, p. 90.

care for the future state of their soul.¹ Their religion expresses itself in good deeds, kind thoughts, and an optimistic attitude towards life, rather than in hysterical and convulsive emotions and acts. One of these has so beautifully described this lofty religious state that it is well worth quoting here:

“I think that many a soul has God within,
 Yet knows no church nor creed, no word of prayer,
 No law of life save that which seems most fair
 And true and just, and helpful to its kin
 And kind; and holds that act alone as sin
 That lays upon another soul its share
 Of human pain, of sorrow, or of care,
 Or plants a doubt where faith has ever been.
 The heart that seeks with jealous joy the best
 In every other heart it meets, the way
 Has found to make its own condition blessed.
 To love God is to strive through life's short day
 To comfort grief, to give the weary rest,
 To hope and love—that surely is to pray.”²

The same criticism applies to his illustrations of the moral, intellectual, and æsthetic sentiments. They are all of a very low order. One who acts from a purely categorical imperative, for example, does not experience a moral emotion, according to Ribot. However, it is not denied that emotions are accompanied by physiological changes of some intensity; the question at issue is, which is cause and which effect; or, how can these changes give rise to emotions? Ribot begs us to banish this question from our minds, but like Banquo's ghost it will not down, his and all other attempts at a monistic explanation of the universe, to the contrary notwithstanding. We ask for something tangible, something comprehensible, and they give us a *flatus vocis*.

Altogether different from the criticisms which object only to the application of the theory to the subtler emotions is that of Professor Irons, who holds that emotion is an ultimate, unanalyzable and irreducible aspect of consciousness and not a product of physiological changes. Indeed, he seems to reverse the query of James and asks, If you eliminate the emotion of fear what would be left if the mere feeling of quickened heart-beats, shallow breathing, trembling lips, weakened limbs, goose-flesh, and visceral stirrings were present? In other words, how can that which is not emotion give birth to emotion?

The statement that A hates B, he writes, is not equivalent to the assertion that A is aware of certain changes in his own body. A's

¹See Leuba: Contents of Religious Consciousness, *Monist*, July, 1901.

²Alice Stead Binney: *The New Century*, April, 1902.

cognition of his own physical condition has nothing in common with that feeling towards B which is the characteristic feature of his consciousness at the time, nor does it explain why A feels impelled to injure B regardless of all consequences to himself.¹

The question is a pertinent one, for in the lower forms of life which have sentiency but not consciousness, many organic perturbations and physiological changes are produced by shocks, surprises, agreeable and disagreeable stimuli, which lead to movements of defence, offence, attraction, repulsion, etc., but we can hardly say that these give rise to, or are accompanied by corresponding emotions. Again, cold produces a shiver, and tickling a laughter which is similar if not the same as that produced by fright and a joke, but the cold does not produce fear, nor the tickling, amusement. Furthermore, why is not the feeling of the physiological changes which provoke a sneeze an emotion?² James' theory affords no answer to these questions. Other writers have therefore attempted to solve the problem by invoking the aid of pleasure-pain, cognition, conation, by deriving the emotions from

a mass or aggregate of sensuous and representative material having a strongly marked and predominant concomitant of feeling or affective tone,³ etc.

Thus, Horwicz laboriously attempts to show that the primary feelings which differ quantitatively from one another are developed out of sense pleasures and pains which differ from one another only in degree of complexity. These primary feelings are then combined to form new and higher complexes which assume specific qualities of their own. In this way he develops the moral, religious, æsthetic, and intellectual emotions from the original sense pleasures and pains. Professor Irons, however, has shown at considerable length that pleasure-pain and emotion are not only different but antagonistic.

The feeling for an object, he tells us, is absolutely distinct from the hedonic feeling conditioned by the object.

The latter is a feeling which is produced in us by an external stimulus, *e. g.*, a blow; the former is our reaction to that stimulus or object. An illustration will make this difference clearer. When we hurt ourselves there are the same physiological disturbances as when we are similarly and purposely hurt by others, but we do not by any means have the same

¹ Irons: *The Psychology of Ethics*, London, 1903, p. 49.

² Irons: *Ibid.*

³ Sully: *Human Mind*, II, p. 57.

emotions in the two cases. However, when the injury inflicted by others is accidental or unintentional our emotions in both cases are practically the same. Pleasure-pain are merely passive effects, something given or imposed, wholly subjective and self-centred; while emotion is a reaction, something done, having objective reference. Over the one we have no control whatever, and therefore no feeling of responsibility is attached to it, over the other we do have control and feeling of responsibility. We are frequently ashamed of our emotions, or manner of reacting to a given object, but never of our pains. Again, the primary emotions are as qualitatively distinct as the primary colors, but pleasures and pains differ from one another only in intensity. Furthermore, we find that the conditions of the two phenomena are entirely distinct. The conditions of pleasure-pain are harmony and discord with reference to our present general state, the conditions of emotion are conception and judgment. Owen Wister, in his *Virginian*, makes the hero say to a ruffian who has called him a vile name, "When you call me that, smile." The same epithet had been previously applied to him by his friends without provoking any disturbance. It is evident that we have here a judgment with reference to the external object, which determines the emotion.

A situation becomes emotionally effective, therefore, only if it is viewed under a definite aspect which has a general significance. The detail, as such, while possessing hedonic potentialities, is irrelevant.¹

A deed intrinsically good and meritorious sometimes pains us more than an actual injury, if it is done in a manner which wounds our pride.

The whole distinction, writes Irons, can be summed up in the statement, that the one (pleasure-pain) is determined by *causes* while the other (emotion) is conditioned by *reasons*.²

Another difference between pleasure-pain and emotion is the different influences they exert on conduct. Pleasure-pain motivated conduct is selfish; we seek to retain the pleasurable and avoid the painful, having regard only to ourselves; emotion-motivated conduct, on the other hand, is altruistic; we lose ourselves in the objects of our love or hate, even when by so doing we are jeopardizing our own interests. In other words, emotion-prompted activity is non-hedonic, whereas pleasure-pain-prompted activity is purely hedonic.

¹ Irons: *op. cit.*, p. 15.

² *Op. cit.*, p. 19.

In short, under the influence of emotion we strive to satisfy or express a feeling towards an object, whereas under the guidance of pleasure-pain we seek to maintain or remove a subjective state which falls absolutely within the limits of our own individual being.¹

Emotion brings us into relationship with our environment, pleasure-pain preserves our individuality.

Pleasure-pain and emotion being so radically different, it is difficult to see how the latter can be evolved from a combination of the former. Besides, certain pleasurable emotions, *e. g.*, love, sometimes give pain, while painful emotions such as hate and vengeance and rage are sometimes pleasurable, even voluptuous. According to Horwicz's theory these facts are inexplicable.

Mr. Henry Marshall and others have offered what may be called a voluntaristic theory of the emotions, that is, they consider the emotions as mere concomitants of tendencies to actions, of impulses and desires which are primary.

All instinctive reactions, writes Mr. Marshall, must have their coincident instinct feelings.²

These instinctive reactions combine in various ways to form voluntary acts, and their coincident instinct feelings also combine, thus giving rise to the emotions. But we have already seen that no definite series or combination of reactions will invariably be accompanied by the same emotion, not even in the same individual. Far from being the mere concomitants of instinctive reactions, emotions are themselves the very springs or conditions of actions, as is seen in love, hate, anger, and the like. According to Mr. Marshall these emotions are mere purposeless epiphenomena, accompanying, but in no wise determining the actions. This is somewhat akin to James' view that our emotions are the feelings of bodily states and changes, to which Professor Dewey rightly objects, that our emotions are

too relevant and important in our lives to be in the main the 'feel' of bodily attitudes that have themselves no meaning.³

If the voluntaristic hypothesis be true, why should the emotion accompanying fighting in earnest be different from that accompanying fighting in the spirit of fun? Evidently, here, as in the case of pleasure-pain, it is not the action, but the feeling attitude determined by judgment, by the point of view,

¹ Irons: *op. cit.*, p. 23.

² Mind, 1895, p. 183. Quoted by Irons, *op. cit.*, p. 44.

³ Psychological Review, 1894, p. 563. Quoted by Irons, *op. cit.*, p. 54.

as we say in common parlance, which explains emotion. If we have a certain feeling attitude and point of view we may even love our enemies, and admire a robber for the artistic manner in which he deprives us of our belongings.

To be accused of drunkenness or unchastity, writes Dr. Worcester, would dispose some persons to violence, but others might feel only the stirrings of pride at what they would consider a tribute to their manhood. In those who consider such a charge opprobrious, it might excite feelings of amusement, contempt, pity or grief towards the one making it, according to the estimation in which he was held. To say that if it makes us strike we shall be angry, if it makes us laugh we shall be amused, if it makes us weep we shall be grieved, does not go to the bottom of the matter. According to the theory, the thought of the estimation in which we are held by others is, in itself, entirely indifferent to us, and only affects our feelings through the muscular movements it excites.¹

How this feeling attitude comes to be, we shall attempt to explain later

Lehmann² attempts to explain emotions in terms of pleasure-pain and cognition. The various pleasure-pain feelings have appropriate ideas bound up with them which serve to differentiate them. The difference between fear and hate, for example, both of which are painful feelings, is due to the fact that each is associated with an idea different from the other; so too of the differences within the same primary feeling, the fear of darkness, for example, and the fear of poverty.

That the fear of darkness is different from the fear of poverty cannot, of course, be denied, but this merely shows that cognition is a condition of emotion, not that it is a constituent of it, for if this were true we should have to expect the same idea always in the same emotion, which we do not find. Indeed, an emotion may, according to circumstances, be associated with very different ideas, and not unfrequently do we have vague general emotions such as fear, anxiety, gaiety associated with no particular idea. Thus we may love one of the gentler sex for her character, or her beauty, her disposition, her intellect or some special talent, or we may be so completely absorbed in her as to have no definite idea why we love, merely knowing and feeling that we do. This state has very frequently been experienced and described by the mystics.³ It is quite common, also, for neurasthenics to declare that they

¹Monist, 1892-93, p. 287.

²Die Hauptgesetze des Gefühlslebens, pp. 17, 18. Quoted by Irons, *op. cit.*, p. 65.

³See my Pathological Aspects of Religions, pp. 69-130

know not why they are afraid or timid, or rather that they know there is no real reason for their fear or timidity.

Sully, Bain, and Spencer evidently have such emotions in mind when they define emotion as

a mass or aggregate of sensuous and representative material having a strongly marked and predominant concomitant of feeling or affective tone.¹

However, we have already seen that emotion cannot be derived from pleasure-pain plus cognition, and the 'mass' notion does not offer any aid, for in very many emotions, especially the stronger ones, there is neither a mass of ideas nor of sense feelings. In fact, the intensity of the emotion varies inversely with the complexity or plurality of its external object. Strong emotions tend to focalize consciousness, not to diffuse it. Again, the advocates of the 'mass' theory ought, as Professor Irons says,

to explain how it comes about that we apply the term 'hate' to a large quantity of pain, a small amount of pleasure, and one set of ideas and sensations, while we also use the word to designate a large amount of pleasure, a small amount of pain, and another set of ideas and sensations. If they assert that amid the diversity there is a unity, they are unquestionably right, but they will find that on their hypothesis the unity in no sense forms a mass. If it be maintained that the emotion differs with the diversity of the alleged constituents, it must be urged that if this were true the diversity would swamp the unity, and there would be very little justification for the application of a common name in the different cases.²

Wundt offers what seems to be a circulatory reaction theory of the emotions. First there is a feeling of pleasure or pain, this feeling inhibits or stimulates ideational activity, this altered ideational activity reacts upon the original feeling giving rise to emotion.³

This theory is somewhat more complicated than the preceding ones but the same objections hold against it as against them. The primary feeling is not necessary for the emotion. As Binet and Courtier have shown it may actually come after the emotion has been completed, and in all cases comes after the emotion has begun.

Professor Rehmke⁴ seeks to avoid all difficulties by considering emotion as a trinity in unity, composed of pleasure-pain, a determining cognitive factor, and certain organic sensations dependent on the intellectual element. Every complex feeling thus constituted has certain bodily consequences. These are called its

¹Sully: *Human Mind*, II, p. 57. Quoted by Irons, *op. cit.*, p. 66.

²Irons: *loc. cit.*, p. 69.

³*Grundzüge der phys. Psy.*, 1887, p. 405. Quoted by Irons, *op. cit.*, p. 70.

⁴*Zur Lehre von Gemüth*, pp. 56 ff.

'expression,' and must be sharply distinguished from the physical element, which is necessarily connected with the cognitive condition, and is a constituent of the feeling itself. The 'expression' is not the cause of the emotion, therefore, and it is equally erroneous to maintain that all the physical changes are the effects of the emotion. The true position is one which mediates between these two extremes.¹

The fundamental objection to this as to the previous theories is that emotion is emotion and cannot be derived or compounded in some alchemic fashion, from something which is not emotion. Emotion is, to repeat what has already been several times said, "an ultimate and primary aspect of mind."

The chief source of error and confusion is the fact that our theorizers, nearly all of whom are psychologists of the first rank, have lost sight of several of the most elementary facts of psychology. The first of these is that mind is not matter, cannot be derived from it, or be explained in terms of it. Consciousness cannot be identified with physiological nor even with brain changes, although the closest and most important relationship exists between it and especially the latter. It seems necessary to emphasize the last point, for our authors appear to have forgotten that the 'epiphenomenon' consciousness accompanies only activities of the cerebral cortex, and that the activities of the rest of the organism,—the various osseous, muscular, and epithelial cells—have nothing in common with psychology because they are not immediately accompanied by consciousness. This is true even of the activities of the sensitive end-organs, which do not enter the psychical realm until they reach the brain and there produce changes of some sort. The cerebral cortex is thus distinguished from the rest of the nervous system and the entire organism by the fact that only its activities are accompanied by consciousness. How this accompaniment is brought about we do not know; if we care to philosophize, we may as well accept the absurd parallelistic clock theory of Leibnitz as any other, we only know that such accompaniment exists, that when the brain is fatigued, stimulated, or diseased there are corresponding changes in the psychical realm, that when there is brain-calm there is mental calm, and when there is brain-storm there is a corresponding mental storm. Now even if we knew the exact nature of these brain changes and storms, if we could see clearly the activities of the many millions of cells and fibres we should still be unable to bridge

¹Irons: *op. cit.*, p. 70.

the gap which separates the mental from the physical. Let us therefore limit ourselves to a consideration of consciousness, remembering all the time that the most intimate and vital relationship exists between it and the cortex, and through the latter, with the rest of the organism.

What consciousness is we do not know; we can only define it negatively, but we do know that it is absurd to think of it as composed of microscopical entities such as images, ideas, memories, emotions, desires, wills, etc., floating about and combining either arbitrarily or according to fixed laws. And yet this is the conception of those who speak of pure ideas, pure feeling, and pure will, and who think of memory as a tablet on which impressions are made and retained, or as a photograph album containing separate images or photographs. Even Professor James cannot rid himself of materialistic conceptions, speaking constantly of 'mind-stuff' and sometimes so far forgetting himself as to speak of a "mere intellectual perception".¹ It is to such crude conceptions that many of the above theories must be attributed. A feeling or two of pleasure or pain, an idea, or a will, or a desire are placed in a flask, stirred up, heated, and behold an emotion slowly or suddenly rises to the surface. Different alchemists employ different methods in the preparation of the emotions, some use more of the feeling, the pleasure-pain ingredient; others, of the cognitive ingredient; some the conative ingredient, and still others would mix them in about equal proportions. Now the point I wish to emphasize is that such specific entities or bits of 'mind-stuff' do not exist except in the imagination. They are merely aspects of consciousness which is unitary and which images, thinks, feels and wills all the time, only sometimes it functions predominantly in one direction, and for practical purposes we say it thinks, but really it is also feeling and willing at the same time; sometimes it functions predominantly in another direction, and again for practical purposes we say it feels, but it is also thinking and willing. In other words, there is no idea without an emotional tone and motor or will value; no will-act without cognition and emotional tone; no emotion without a motor value and cognition. Wundt has shown that our ideas of color are not pure ideas, but have an affective tone; white is gaiety, green a quiet joy; red,—energy, strength, etc. The same is true of

¹ Principles of Psychology, II, 471.

our ideas of number, as those familiar with the psychology of number and number forms will remember, and even in our most abstract conceptions, such as time, space, eternity, the Absolute, the affective tone and motor value may be so great as to completely overwhelm us. Musical sounds suggest colors and have a variety of meanings, and, of course, written or spoken words are saturated with the threefold consciousness, so that when we read a book or listen to a speaker we have the ideas, and feelings, and perform the acts that are appropriate.

If, now, our contention that consciousness as such, is emotive, cognitive, and conative be true, we can explain the emotions by saying that they are merely an aspect of consciousness which becomes predominant under certain conditions. But what are these conditions? We have already replied, there must be an idea or a series of ideas, vague or clear, or an object which is cognized and judged as to its relation to the individual. A process less direct and simple should hardly be expected of a Nature which shows so many evidences of a tendency to economize in every direction.

Let us apply this view to concrete cases and see how it works. The difference between this view and the others, especially that of James and Lange will thereby be made clearer. Our view is the common-sense one that we see a bear, are frightened and run; we are insulted by a rival are angry and strike. To which James objects, saying:

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.¹

But what a pure, pale, colorless cognition, destitute of emotional warmth is, we have no conception, nor can we understand why such a pale, colorless cognition should give rise to certain bodily states rather than to others. That is to say, why should the perception of a bear make us tremble rather than laugh?

Moreover, as Dr. Worcester points out, a chained or caged bear may excite only feelings of curiosity, and a well-armed hunter might experience only pleasurable feelings at meeting one loose in the woods. It is not, then, the perception of the bear that excites the movements of fear. We do not run from the bear unless we suppose him capable of doing us bodily injury. Why should

¹Principles of Psychology, ii, p. 450.

the expectation of being eaten, for instance, set the muscles of our legs in motion? "Common sense" would be likely to say it was because we object to be eaten, but according to Professor James, the reason we dislike to be eaten is because we run away.¹

Is the idea of danger a colorless one, and destitute of emotional warmth? Is there no innate difference between the idea of suffering or death and the ideas of ether and atoms? If our ideas, I repeat, are colorless, indifferent, and destitute of emotional warmth, why are not our reactions accompanying these ideas or perceptions also colorless, that is, indifferent or always the same? "Objects," replies Professor James, "excite bodily changes by a preorganized mechanism;" these changes are immediately FELT, and the feeling of them is the emotion. The first half of the statement is as true as the second half is false. The mere awareness or feeling of bodily changes can cause comfort or discomfort, sense-pleasure or pain, but not the feeling of awe, or sublimity; love, or hate; pity or shame. I might be struck by a falling brick. That would give rise to bodily feelings which we call pain. But if the brick is hurled at me by an enemy, I experience not only pain, but an emotion—anger, hate, vengeance, or all three.

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?²

Perhaps not, because mind and body are inseparably connected, but surely we cannot for that reason equate the one with the other. Rage may give rise to these bodily disturbances, but in itself it is something entirely different, having reference to an external object and not to the bodily excitations. It is an object, or individual, or event which we judge to be in a most undesirable relationship to ourselves that causes us to rage, not the bodily changes, for why, in the first place should our chest heave, our face flush, our nostrils dilate, and our teeth clench? Again, are the tears, sobs, suffocation of the heart, pang in the breastbone, the immediate cause of grief, or is it the cognitive-emotive realization of the fact that one most dear to us is dead, which realization makes us cry and suffer? Janet writes to James concerning his anæsthetic patient,

I have often pricked or burned her without warning, and when she did not see me. She never moved and evidently perceived nothing.

¹ Monist, 1892-93, p. 287.

² James: *Op. cit.*, p. 452.

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!'¹

The query immediately arises, did she cry because she was afraid she was suffering, or was she afraid she was suffering because she cried?

But what of instinctive emotions, such as fear of darkness, high places, loud sounds, domestic animals, and a host of other objects, especially when we are fully conscious of the fact that there is no danger for ourselves or friends. Do not these

produce wide-spread bodily effects by a sort of immediate physical influence, antecedent to the arousal of an emotion or emotional idea?

In answer we must make use of facts which since President Hall's forceful presentation of them have become common-places in science. I refer to the recapitulation theory, according to which there are vestigial traces in the mind as well as in the body. The new-born infant is not *sans* mind; on the contrary, it comes into the world freighted with vestigial traces of racial experience which cannot be obliterated by the more recent experiences of the individual. The individual may know that there is no dangerous object lurking in the darkness, that his friend on the precipice is perfectly safe, that the dog is harmless; but all these have been sources of painful experiences in the past, and with the perception of them is inseparably associated the racial fear. That is to say the perception itself is emotional. We shall have more to say on this subject in another section. Suffice it here to indicate that the little chick has an instinctive fear of a hawk which is absent in the child, or the young of other animals, and that there are many instinctive fears in the child which is not present in the lower animals.

Again, what shall we say of the unreasoned fears so frequently found in the insane? Here, at least, we seem to have fears which are wholly produced by brain and bodily disorders, at any rate the patients themselves can assign no reason for their fears. These facts, however, merely show that there is concomitance between mental and physical disorders, they do not prove causality, and when we shall treat of phobias we shall find that they sometimes exist in individuals whom careful examination shows to be in perfect physical health and of

¹ Quoted by James: *op. cit.*, p. 456 footnote.

a robust constitution. On this point Professor James admits in a footnote that he is

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. . . . These are 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, he adds, 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.¹

It is probable, because for the sake of his theory he wishes it were not certain. We have here a beautiful demonstration of the fact stated by the author in another work, that, "as a rule we disbelieve all facts and theories for which we have no use."²

However, a crucial test of the view here presented, and one which at the same time would disprove the James-Lange theory, would be a subject absolutely anæsthetic inside and out, who could not feel his bodily changes, but *could* experience emotions. It will be noticed that this test differs somewhat from that proposed by Professor James, who requires an anæsthetic subject incapable of experiencing emotions. Fortunately there are at least three good cases of this kind on record. One, Professor James himself cites from Professor Strumpell, of a lad of fifteen who had manifested shame, grief, surprise, fear, and anger on appropriate occasions; two cases of general cutaneous and sensory anæsthesia reported by Dr. Berkley—one, a woman who had complete loss of sense of pain, heat and cold, pressure and equilibrium, of smell, taste, and sight; almost complete loss of sense of touch, position of the extremities, visceral sensations; and partial loss of the sense of hearing. She manifested shame, grief, surprise, fear, and substituting for anger, repulsion.

My own impression derived from observation of the patient, writes Dr. Berkley, is, that all mental emotional sensibilities are present and only a little less vivid than in the unæsthetic state; and that emotions are approximately, and not at all coldly dispassionate.³

In the second case, a Russian woman, aged thirty-five, there was

a complete loss of cutaneous sensibility in all its qualities: the sense of

¹ *Op. cit.*, p. 461.

² *The Will to Believe*, p. 10.

³ Quoted by Worcester: *Monist*, 1892-93, p. 294.

position ("muscularsense") was almost completely abolished; the sense of taste was absent in the anterior two-thirds of the tongue. Smell, sight, and hearing were preserved. In regard to her case Dr. Berkley writes: 'While in the most absolute state of anæsthesia (auditory and visual excepted) there was no departure from a normal psyche; the woman would sometimes be angered when she did not understand a question, at others would smile or shake her head, and would frequently laugh and talk with another Russian woman in the same ward. There was never the slightest apathy manifest after the first few days of febrile movement.'¹

But even if we did not have these cases, we could not read the wonderful literature of the mystics of all lands and ages and still believe that our emotions, even the sublimest, are derived from physiological changes. What rôles, for example, do anatomy and physiology play in the following poetical passages which describe their authors' mystical experiences?

Tennyson :

And more: my son! for more than once when I
Sat all alone, revolving in myself
The word that is the symbol of myself,
The mortal limit of the Self was loosed,
And passed into the Nameless, as a cloud
Melts into Heaven. I touch'd my limbs, the limbs
Were strange not mine—and yet no shade of doubt,
But utter clearness, and thro' loss of Self
The gain of such large life as match'd with ours
Were Sun to spark—unshadowable in words,
Themselves but shadows of a shadow-world.²

Wordsworth :

These beauteous forms,
Through a long absence, have not been to me
As is a landscape to a blind man's eye;
But oft in lonely rooms, and 'mid the din
Of towns and cities, I have owed to them,
In hours of weariness, sensations sweet,
Felt in the blood, and felt along the heart;
And passing even into my purer mind,
With tranquil restoration:—feelings, too,
Of unremembered pleasure; such, perhaps,
As have no slight or trivial influence
On that best portion of a good man's life,
His little, nameless, unremembered acts
Of kindness and of love. Nor less, I trust,
To them I may have owed another gift
Of aspect more sublime; that blessed mood,
In which the burthen of the mystery,
In which the heavy and the weary weight
Of all this unintelligible world,
Is lightened,—that serene and blessed mood,

¹Quoted by Worcester: *loc. cit.*, p. 294. Dr. Berkley has published his observations in *Brain*, 1891, part IV.

²Tennyson: *Ancient Sage*. The italics are mine.

In which the affections gently lead us on,—
Until, the breath of this corporeal frame,
And even the motion of our human blood
Almost suspended, we are laid asleep
In body, and become a living soul:
*While with an eye made quiet by the power
Of harmony, and the deep power of joy,
We see into the life of things.*¹

Kingsley :

And yet what bliss,
When dying in the darkness of God's light
The soul can pierce these blinding webs of nature,
And float up to the nothing, which is all things—
The ground of being, where self-forgetful silence
Is emptiness—emptiness fullness,—fullness God,—
Till we touch Him, and, like a snowflake, melt
Upon His light sphere's keen circumference.

If, in the foregoing presentation, we have laid emphasis on the mind and ignored the body as if it were a mere hypophenomenon, it has been in order to present our view as clearly and as forcibly as possible. We are not unmindful of the great influence which bodily conditions and disturbances exert on consciousness through the brain, of the effect of rest and fatigue, of various narcotics and poisons, and diseases, but we have been chiefly concerned in showing that the mind exerts equally as great, if not greater influence on the body, that there are mental storms which may disorganize the body, and mental calms and harmonies which, as is well known, have wrought cures which seem almost miraculous. We have attempted to show that the emotions are primary, ultimate, unanalyzable aspects of mind which determine conduct and shape character; which make possible our intellectual joys and sorrows, our æsthetic delights and aversions, and our indescribably happy and unhappy moral and religious experiences.

The writer is neither exclusively an idealist, nor a materialist, but avowedly and unblushingly an unphilosophical dualist, who, when he considers the vastness and mysteriousness of the heavens, feels himself too closely akin to the worm of the dust to even attempt to solve the riddle of the universe. But this he firmly believes, that a noble soul which rejoices in the happiness of its fellow-beings and suffers itself that others may have greater joy—a Jesus, a Buddha, a Moses, and very many others—these are more than their weight in avoirdupois, more than heart, liver,

¹ Wordsworth: On Revisiting the Wye. The italics are mine.

lungs, and kidneys and their divine sentiments cannot be accounted for by a philosophy wholly materialistic. Descending a step or two lower, he cannot believe that the pleasures and pains of a cultured mind are unlike those of an ignorant peasant merely because of differences in bodily organs.

Were this the case, all education would be useless and a waste of time, for why should we accumulate and develop ideas if they have no emotive-conative value; if all that we need is a viscera?

What is he but a brute
Whose flesh hath soul to suit,
Whose spirit works lest arms and legs want play?
To man, propose this test —
Thy body at its best,
How far can that project thy soul on its lone way?

—*Browning.*

CHAPTER II.

NEUROLOGICAL AND PHYSIOLOGICAL CHANGES ACCOMPANYING FEAR.

In view of the conclusion reached in the preceding chapter, it might seem superfluous and a waste of energy to study the neurological and physiological changes which accompany the emotion of fear. Superfluous, perhaps, from purely monistic and utilitarian points of view, but not so from the broader dualistic and humanistic ones, the former of which makes no attempt to juggle one or the other half of the universe out of existence, or at most making one a mere accident of the other, but believes in the ultimate reality of both as co-ordinate and somehow correlated, yet absolutely distinct; and the latter which experiences a joy in the very act of acquiring knowledge, a joy which stands in no mathematical relationship to the practical value of the facts known, and is not lessened by the consciousness that the human mind is too puny to comprehend the universe all in all. The various physical phenomena are interesting in themselves, regardless of our inability to prove conclusively that they are the causes, or effects, or mere accompaniments of the emotions, and the fact that they almost invariably accompany the psychical experience lends them added interest. Even were it admitted that the psychical experience of fear is the mere consciousness of quickened heart-beats, hurried breathing, pallor, goose-flesh, horripilation, dryness of the mouth, dilatation of the nostrils, protrusion of the eyeballs, contraction of the bladder and intestines, perspiration, trembling, and other disturbances, our study would still be without practical value since all of these disturbances are of involuntary origin and cannot be controlled by the will, nor by physical means. We shall have no remedy to offer which will cure mankind of its fears, and yet we are of the opinion that a study of this kind is as valuable and interesting as money-making or bridge-building or any of the practical pursuits of man. The desire to know our own organism is self-sufficient and needs no apology.

It will be noticed that we speak of *neurological* and physi-

ological changes. This is done purposely, to emphasize the fact, too frequently overlooked, that cortical rather than somatic changes are most immediately connected with the emotions; in other words, that phenomena of consciousness are linked only with the nervous system and especially the cerebral hemispheres. Binet-Sanglé and Hartenberg are the only ones, so far as the writer knows, who have fully appreciated this fact and have attempted to give it the prominence which it justly deserves. The latter draws a sharp line of demarcation between those parts of the system whose activity is accompanied by a revelation "immediate and instinctive," and those whose activity is known to us only mediately by centripetal transmission.

Every phenomenon, he writes, which occurs outside of the cortical substance may be considered as physical phenomenon (in the sense of James and Lange). Every phenomenon which takes place inside the cortical substance may be considered as psychical phenomenon.

The latter is also physical, to be sure; every subjective state has necessarily an objective basis; every state of consciousness supposes implicitly a functional modification in the substance of the cerebral cortex. But among all the physical operations which take place in our organism there are some which have their seat in the cerebral cortex, which possess something more than the others, namely, consciousness; and this distinguishes the psychological from the physical phenomena.¹ Emotion is, therefore, according to this author, essentially an intra-cortical movement.

Each primary emotion is an innate complexus, a reaction adapted to a certain end, a synthesis of combined and co-ordinated movements which are specific and invariable for each emotion. Thus understood, a definite emotion is the equivalent of a definite gesture; only, the movements of the first take place largely within, the movements of the second largely without the cerebral cortex.²

Except that he shifts the seat of the emotions from the heart and viscera to the brain, the author agrees with James, Lange, and Ribot. The chronological order of events in the production of an emotion is as follows:

1. Motor centrifugal cortical excitation.
2. Motor somatic reaction.
3. Sensory centripetal excitation.
4. Cortical reception of sensory excitation. (b) Conscious epiphenomenon.

¹Paul Hartenberg: *La Peur et le Mécanisme des Emotions*, *Revue Philos.*, 1899, XLVIII, 113-134.

²*Ibid.*

A few words of explanation will render the above clearer.

1. Every emotion, according to our author, is represented neurologically by a series of neurones arranged in a functional hierarchy, and belonging to different levels. At the highest level is a group of cortical neurones whose function it is to associate centres of psychical activity with appropriate centres of motor activity. These cortical emotional centres give rise on the one hand to the emotions and on the other to the appropriate physiological changes. For each definite emotion, therefore, there is a cortical centre of association whose rôle is to direct and distribute its excitation among the various centres involved in that particular emotion. In other words, each emotion is represented by a definite, but extremely intricate cellular plexus involving ideational, sensorial, motor and organic centres, and having for its nucleus, so to speak, the associational neurones which are the very first to be excited in the production of an emotion. Being thus synenergetically associated with a variety of centres of different orders and levels, the excitation of any one of these can, under proper conditions, spread over the whole plexus and provoke the entire emotion; so that we may say that any state of consciousness which has once been associated with an emotion, is henceforward capable of reproducing the latter. When a scene, for example, has once profoundly impressed us, each important detail of the scene will suffice later to recall the initial emotion, and if its motor image is in a state of hyperexcitability, the whole emotion will be provoked as intensely and completely as on the first occasion. Among the various images associated in an emotional complexus, special mention should be made of verbal images which in emotives are sufficient to provoke, in a rough state at least, the subjective feeling of the emotion. This physiological union between the verbal image and the emotional image is even more immediate in certain pathological and experimental conditions. Thus, if one says to a hypnotized hysteric: "You are afraid," the subject immediately becomes pale, trembles, is covered with cold sweat, suffers respiratory and cardiac disturbances, and shows unmistakable signs of great anguish. The mere calling-up of the auditory-verbal image of the emotion suffices, in them, to provoke the whole emotion.

In the case of emotions which are predominantly physiological or reflex, such as surprise, bewilderment, anxiety and shock, which are produced by a strong or unexpected stimu-

lus without the participation of any psychical representation, only the sub-cortical portion of the neuronie plexus is, according to our author, put into activity.

2. The motor somatic reaction, or what is commonly called the expression of the emotions, follows immediately upon the excitation of the associational neurones. The initial excitation leaves the cortex and reaches the bulbo-medullary centres of execution producing muscular and vascular contractions in the various parts of the body, which in turn give rise to paleness, trembling, cold sweat, goose-flesh, respiratory and circulatory disorders, intestinal spasms, paralysis, etc.

3. These organic disturbances produce impressions on the sensory nervous extremities of the skin, organs, glands, tissues, etc., which ultimately reach the organ of conscious psychic life, namely, the cortex.

4. Here a double process takes place. First, there are modifications in the cerebral cells, then a revelation of these modifications in consciousness.

(a) *Objective phenomena.* Each of the excitations mentioned in (3) reach the sensory or Rolandic area of the cortex at different points, according to their origin. They are then associated with each other and with other cortical centres and centralized by means of sensory centres of association, just as in the first instance the various cortical motor centres are associated and centralized by means of the motor centres of association. These sensory centres of association determine the nature and quality of the emotion by apperceiving as it were, the sensory impressions.

(b) *Conscious epiphenomena.* The modifications of the cerebral substance translate themselves subjectively in consciousness. It is thus on the fourth reaction in the series that we experience an emotion consciously. This agrees with the James-Lange theory that

the consciousness of an emotion is the consciousness of the organic disturbances of that emotion.

Until the sensory centres of association are excited we have only elementary, disassociated impressions revealing the state of this or that part of the organism, not a unified whole which is apperceived and comprehended; just as the common visual centres give us notions of color, form, surface, etc., but not the cause of the color and form, nor the meaning of the object. In cases of cortical lesions which interrupt the association paths between a visual centre and its appropriate verbal cen-

tre the patient sees graphic signs without recognizing their significance. The same is true, of the auditory and motor aphasias. An experience which is understood involves a synthesis of sensorial, motor, verbal, and ideational images which are apperceived and related by means of the sensorial image of association.

While not attempting, as others have done, to localize the seat of the emotions, Dr. Hartenberg takes full account of Flechsig's and others' studies on the embryogeny and pathology of the nervous system and concludes that the motor neurones of association must be in the frontal lobe, and the sensory neurones of association in the prefrontal lobe connected with, or superimposed upon the motor neurones of the same emotion. Various parts of the nervous and sympathetic systems are involved in the production of an emotion, but these two centres are the most important.

To résumé: an emotion is a complex motor reaction composed of four separate and successive nervous reactions forming a complete circle beginning with the nervous centres and proceeding outwards toward the periphery, thence returning to the nervous centres. Two of these reactions are cortical, but only the sensory, which is last in the series, is accompanied by consciousness. The consciousness of the emotion is the consciousness of the cortical and organic changes which take place. But these changes are not the cause of the emotion, since they are themselves caused by a previous cerebral process which is a part of the mechanism of the emotion; they are merely the cause of the consciousness of the emotion.

M. Binet-Sanglé takes a somewhat similar view, but elaborates it in much greater detail, and attempts to explain neurologically, the various phenomena resulting from fear experiences. Defining fear as

the feelings of physiological modifications (increase in the intensity and frequency of respiration and cardiac contractions, vaso-constrictions, etc.,) determined by an image of a disagreeable sensation, possible or imminent, that image being aroused by an external stimulus,¹

he at once proceeds to analyze the psychological mechanism as follows:

Psychological Mechanism of Fear.

1. A sensation is felt.

¹La peur et le courage militaire: Arch. d'Anthropol. Crim., 1905, XX, p. 458.

2. That sensation calls up an image of another disagreeable sensation, possible or imminent.

3. Physiological modifications in the organism result.

4. These physiological modifications determine the complexus of internal sensations, which constitute fear.

It is not necessary to experience the exact sensation, the possibility or imminence of which provokes fear. It suffices if one can imagine analogous sensations. He quotes Ribot approvingly to the effect that,

with most men the absence of fear is only an absence of imagination. I have observed a subject, who, while walking in the street and imagining that he might, a moment before, have been run over and crushed by a wagon, pictured the scene so vividly that he stopped suddenly, clenched his fist and uttered a sharp cry.¹

Binet found bright, imaginative children to be more susceptible to fear than dull, unimaginative ones.

More interesting and suggestive, however, is the author's analysis of the *Physiological Mechanism of Fear*.

The nervous system, he reminds us, is a machine, which, like every other machine, merely transforms the energy or movements which set it in motion. It is composed of a mass of separate but contiguous nerve-cells which communicate with each other by means of their branches, thereby forming a unified whole. Each nerve-cell or neurone receives through its sensory pole the energy which comes to it from the external world, and restores it to the external world through its motor pole. But on account of the contractibility of the neurones, the pressure of energy is not the same in all the branches. Consequently, when a neurone contracts, there forms in the substance of the branches, owing to the changes in density, what he calls *neuro-dielectriques*, i. e., poor conducting zones, which interrupt the nervous current. The energy of the nervous current being thus interrupted, escapes through the collaterals into the neighboring branches or conductors, the pressure of which is increased by so much. In the entire system the contraction of a certain number of neurones has the following result:

1. The interruption of a certain number of conductors, and consequently a group of physiological phenomena which he calls the *phenomena of the interrupted circuit*.

2. Increase of pressure in the other conductors, and con-

¹ Ribot: *Psychologie des Sentiments*, p. 209.

sequently a group of physiological phenomena which he calls *phenomena of the short circuit*.¹

The cortical neurones are classified into sensory, mnesic, superior motor, and superior trophic, and their existence is proven by the various aphasiae. Thus, one may become blind and retain his visual images, or lose his visual images while retaining his sight, which proves the existence of mnesic neurones. Likewise, the existence of superior motor neurones is proven by cases of motor aphasia without loss of auditory images and without paralysis of the muscles controlling the voice.

In fear experiences, phenomena both of the interrupted and the short circuit are present. The phenomena of the former may be arranged under the following four heads:

PHENOMENA OF THE INTERRUPTED CIRCUIT.

1. Hypoesthesias and anesthetics,
2. Hypomnesias and amnesias,
3. Paresis and paralysis,
4. Diminution or abolition of the trophic phenomena.

1. HYPOESTHESIAS AND ANESTHESIAS. Fear is accompanied by a general sensorial obtuseness. The visual acuity is diminished, or, to use the author's words,

there is a veil before the subject's eyes, a neuro-dielectric veil placed before the group of neurones in the calcarine fissure, before the 'cortical retina.'²

The neuronie contraction can be so pronounced and persistent (tetanus of the neurones), the neuro-dielectrics so thick and resistant, as to bring about a complete and persistent blindness analogous to hysterical dimness. The same is true of auditory acuity. Under the influence of fear one can suddenly become deaf. When the contraction takes place in the neurones of pathic sensations, a cessation of pain is observed. Sharp has seen rheumatic pains disappear in this way, and Féré cites the case of a man afflicted with gout, who seeing a board about to fall on his child rushed to save it and was immediately delivered of his trouble.

Fear sometimes causes complete analgesia which can be accompanied with aphobia, as if the neurones which are the

¹ Cf. Ramon y Cajal, Einige Hypothesen über den Anatomischen Mechanismus der Ideenbildung der Association und der Aufmerksamkeit, Archiv f. Anatom., 1895, p. 367.

² See *loc. cit.*, pp. 513-545.

seat of internal sensations and emotions were contracted. This is the explanation which the author offers for such phenomena as that observed by Livingstone on himself. Having been knocked down and shaken by a lion, he described thus his experience :

There was a kind of numbness in which no painful sensation entered, no feeling of terror, although I had complete consciousness of what was going on.

“Numbed with fear,” “transfixed with fear,” are very common expressions. Finally, fear can cause thermanesthesia, cryanesthesia, anorexia, and cure sea-sickness.

2. HYPOMNESIAS AND AMNESIAS. Fear sometimes causes neuronie contractions which produce an eclipse over the mnesic cells. The subject then finds himself deprived of a certain number of images and ideas, his associations are broken (many association paths being interrupted) there is mental disorder, confusion, stupor, and Pinel has observed momentary idiocy. According to Buchnill and Tuke, fear can cause such persistent contraction of the mnesic neurones as to produce dementia. Another effect of the contraction is to render the registration of sensations contemporary with the emotion difficult and even impossible. Actors, for example, under the influence of stage-fright sometimes forget that they are on the stage to play.

3. PARESIS AND PARALYSIS. Two conditions are possible. (1) The neuro-dielectrics formed by contraction in the motor centrifugal conductors may not be insuperable. The current continues to pass, but in the form of discharges rather than of a continuous stream. Muscular twitches and temporary paresis result. The trembling may be generalized or it may be localized in the hands, jaws (the teeth chatter), in the vocal muscles (the voice trembles), in the muscles of the legs (the knees shake). In some cases the trembling persists for a long time. Kohts has collected many cases of *paralysis agitans* brought about by fear during the siege of Strasbourg, and Féré has observed this mode of beginning for general paralysis. If the neuro-dielectrics have a very great resistance, owing to an intense tetanus of the neurones, the centrifugal discharges, being stronger and less frequent manifest themselves as choreic twitches. Fear holds an important place in the etiology of chorea. In 110 cases Peacock attributes 25 to fear. Stuttering, which is chorea of the vocal muscles, falls also under this influence.

This explanation differs from that of Mosso, who holds that trembling is due to the nature of nervous discharges in muscles.

Generally, he says, the discharges in muscular exertion begin in a few fibres; when these become weak, others come to reinforce the contraction; these cease, and others are charged; those are exhausted and others take up their work; thus a continuous tension of the muscles may be maintained. We must, therefore, consider the contraction of a muscle as an extremely rapid trembling of its most minute parts. When we become weaker through illness or from any other cause, we tremble because the contractions are so drawn out and distended as to show the elements composing them. If we poison a frog with some substance which diminishes the vitality of the nerves, there is a trembling of the legs at every exertion which the animal makes to move.

Again, he writes: Trembling may be produced by two opposite causes, either by an excessive development of nervous tension or by weakness. Exhaustion or over-excitement of the nerve centres destroys the harmony of aim of muscular contractions. If we endeavor to keep the arm stretched out, we find we are not able to regulate the nervous discharge in such a manner as to preserve the equilibrium of the muscles during work, they relax and contract alternately on one side or the other bringing about a perpetual wavering, and the organs of the body sway, waver, or tremble according to the rapidity with which the muscles relax, without the will being able to control them.¹

Fear sometimes causes hysterical and epileptic attacks. Binet reports the case of a child who having gone to witness a hanging returned all in a tremble and had an attack of hysteria the next day. President Hall cites the case of a little girl whose mother touched her hand in the dark; she jumped, fell down stairs, and had a severe attack of hysteria. Another girl writes him, "when jumped out at one night, stood panting and silent for some time; was nervous all the evening and night; next day had nausea and fainted, and may never quite get over it."² Legrand du Saulle has collected eight cases of epileptic attacks following immediately after a fear experience, and Landouzy has seen the emotion give rise to athétose.

(2) The neuro-dielectrics may be insuperable. Forgetfulness results. The muscles continue to function in a reflex manner, but they are withdrawn from the action of the conscious neurones. Under the influence of terror the seal is unable to escape; the whale remains motionless on the surface of the water and allows itself to be harpooned easily; man remains still, with mouth open, unable to complete the gesture begun, immobile, petrified, "more dead than alive." We frequently speak of being dead or stiffened with fright, "rooted to the ground with fear," etc.

¹ Mosso: Fear, pp. 140-145.

² A Study of Fears, *Am. Jour. Psych.* Vol. 8, No. 2, pp. 194-5.

Not all the muscles, however, are always withdrawn from the influence of the conscious neurones. Sometimes, only a group of muscles governed by motor neurones of a lower level are thus affected, and it may happen that within the group only a certain muscle, or perhaps only certain fibres of a muscle are involved. There result jerky movements, awkwardness, inco-ordination, ataxia. The subject stammers, stutters, stumbles, lets fall whatever he holds, etc. The following are some of the phenomena consequent upon the paralysis of the different groups of muscles:

Phonic muscles. The voice grows weak, the tone is lowered and becomes deep and hoarse. Sometimes motor aphasia occurs.

Facial muscles. The paralysis of the motor muscles of the eyes, particularly of the internal right and the irian sphincter, explains the wild look and the mydriasis of fear.

Muscles of the limbs and organs. The legs bend, tremble, and are sometimes unable to support the body. Paraplegia and hemiplegia have been observed to follow fright.

The vesical and anal sphincters may relax, allowing the urine and fæces to escape. This paralysis is related to that of the irian sphincter. There is a functional relation between the two so that a dilatation of the anus is accompanied by a sudden and considerable dilatation of the pupils.

Vaso-constrictors. By causing a contraction of the vaso-constrictor neurones which are closely connected with the sympathetic and with centres in the medulla fear produces a vaso-dilatation allowing the serum to transude into the environing tissues and causing pimples and even blisters to appear. Follain cites the case of a frightened pilot who lost consciousness and his whole body was covered with blisters in less than an hour. The diarrhœa of fear appears to be due to an intestinal vaso-dilatation. Diapedesis of the red globules or the rupture of the small vessels, purpura, perspiration of the blood, and multiple hemorrhages have also been observed. By causing paralysis of the vasomotor neurones fear produces physical impotence.

Cardiac muscle. The heart can slacken its pulsations, or cease to beat, in which case it brings about that phobic syncope observed so frequently in military quarters when recruits are vaccinated. It appears to be due to the contraction of the superior motor neurones which control the cardiac filaments of the sympathetic nerve. This syncope may persist and bring

on death. Death from fear is frequent among those suffering from heart troubles, and is possible even to healthy individuals. Féré cites the experiment performed by medical men of Copenhagen to try the effect of imagination upon one condemned to death. After having closed his eyes, they pretended to bleed him to death; he died at once. A wet towel was passed round the neck of the buffoon of the Duke of Ferrara with the same result. There are also many cases on record of sudden death during the preparations for an operation.¹

It is seen from the above that the author explains muscular twitches and paralysis of fear by supposing the formation of neuro-dielectrics of greater or less resistance in the nerve conductors. In further support of this hypothesis he cites the following interesting case: A seven-year-old child fell in a cellar and was taken out pale and trembling. The next day it was taken with choreic fits which affected at first the left hand and face, but was not slow in generalizing itself while remaining largely in the left side. Soon this whole side became flabby and a diurnal and nocturnal incontinence of urine and fæces appeared. At the end of three weeks the left hemiplegia improved, the twitches on that side reappeared, then grew gradually weaker and finally disappeared. The next year the child was frightened by a bull. Again, trembling of the lower limbs and paresis. When carried into the house, the choreic twitches reappeared and were soon complicated with left hemiplegia and diurnal and nocturnal incontinenes of fæces. Recovery was followed the next year by a new relapse occasioned by fright received from a drunken man. The choreic twitches reappeared and became complicated again with left hemiplegia.

Finally, the contraction can cover so large a number of neurones that the subject presents a total anæsthesia and paralysis. This is not syncope, but a lethargy which has been called *cataplexy* by Preyer. This phenomenon has been observed in mollusks, coleoptera, arachnids, crustacea, bacrarians, birds, and mammiferæ (mole, guinea-pig, man). But in the case of the lower animals it is difficult to distinguish those elements in the cataplexy which are due to impressions received by the animal and which act like hypnogogic causes, from those elements which are immediately due to fear. Mr. W. H. Hud-

¹ Féré: Pathology of Emotions, p. 214.

son, in an interesting chapter on the death-feigning instinct shows that those insects, birds, and animals which feign death are really more dead than alive, and in some cases they are found to be actually dead.

The swoon sometimes actually takes place before the animal has been touched, and even when the exciting cause is at a considerable distance. I was once riding with a gaucho, when we saw, on the open level ground before us, a fox, not yet fully grown, standing still and watching our approach. All at once it dropped, and when we came up to the spot it was lying stretched out, with eyes closed and apparently dead. Before passing on my companion, who said it was not the first time he had seen such a thing, lashed it vigorously with his whip for some moments, but without producing the slightest effect.¹

4. PHENOMENA OF HYPOTROPHISM.

Salivation. Following the contraction of the neurones which control the filaments of the sympathetic, a diminution of salivation with dryness of the mouth and throat is observed.

Lacteous secretion. Astley Cooper cites two examples of instantaneous suppression of lacteous secretion consequent upon a fear experience.

Canitie. Many cases of whitening of the hair due to fear have been collected. P. Parry reports that the hair of a sepoy whitened during the examination which preceded his condemnation to death, and Thompson mentions a laborer of York who, falling from a high building, caught hold of a rain-spout and held on. When he was rescued, his hair was found to be white. It may be that the nerves of the hair follicles are somehow connected with the cells of the medulla or cortex, or that the hair itself is as good a conductor of a nervous current as it is of an electric current.

The alteration of the red corpuscles. Under the influence of fear, anemia sometimes suddenly appears.

Paralysis of the leucocytes. Féré's experiments on pigeons, rabbits, and white mice with various cultures showed that under the influence of fear the leucocytes were paralyzed and consequently unable to combat the pathogenic microbes. This explains the important rôle which fear plays in infections, especially during epidemics.

Dyspepsia with dryness of the mouth and bitter taste, and a lowering of the bodily temperature sometimes as much as thirty-three degrees centigrade have also been observed. The

¹ W. H. Hudson: *The Naturalist in La Plata.* London, 1895. p. 203.

phenomena of hypotrophism can acquire sufficient intensity to cause death. The disastrous effects of administering the last sacraments to the sick have been frequently noted, and Haller mentions the case of a man who passing over a grave felt himself held by the foot and died the same day.

PHENOMENA OF THE SHORT CIRCUIT.

As in the case of the phenomena of the interrupted circuit, the phenomena of the short circuit can have for their seat: (1) sensorial neurones, (2) mnesic neurones, (3) superior motor neurones, (4) superior trophic neurones. These can be arranged under the following four heads: (1) Hyperesthesias, (2) Hypermnesias, (3) Phenomena of hypertonus, (4) Phenomena of hypertrophism.

1. **HYPERESTHESIAS.** Hyperesthesia can be established in relation to the object which excites fear. If that object affects vision or hearing, the subject sees or hears only it, and sees or hears it very clearly. Fear magnifies the object. This is also true for the other senses. Those who are subject to excessive fear of pain have hyperalgesia; the extremely fastidious have hypergustativity or hyperosmia; those who are extremely sensitive to touch, who fear the touch of a peach or velvet have hypertactesthesia; people who fear the cold suffer from hypercryesthesia, while those who fear warmth suffer from hyperthermoesthesia.

2. **HYPERMNESIAS.** Memory and imagination, that is to say, the functions by which the memory images arrange and combine themselves, play a considerable rôle in fear. The child subject to nocturnal fears suddenly awakes, sits up and fixates a point in space. What it is really looking at is a projected image produced by nervous waves emanating from the neurones of the visual centres and pressing upon the neurones of peripheral vision, *i. e.*, the retina. The hallucination is only the persistence of the prominent dream images. Féré reports the case of a child who, seeing black bears in a dream, started out of its sleep and continued to see the bears walking around its bed until a strong light was turned on. This continued for a period of two years.¹ The experience of Job was due to just such a cause.

“In thoughts from the visions of the night, when deep sleep falleth on men, fear came upon me and trembling which made all my bones to shake. Then a spirit passed before my face; the hair of my flesh stood

¹ Féré: *op. cit.*, p. 368.

up; it stood still, but I could not discern the appearance thereof; a form was before mine eyes; there was a silence, and I heard a voice saying, Shall mortal man be more just than God, shall a man be more pure than his maker?"

The condition of the hypnophobe is analogous. He perceives only his hallucination; to everything else he is blind and deaf. He acts like one in a state of somnambulism, that is to say, the vigil is kept by only a few neurones in the midst of the cerebral colony which sleeps, these neurones bearing alone the whole pressure of the system.

Those who have escaped from a violent death have seen the principal events of their lives roll before them at the moment they thought they were dying. This is but another phenomenon of hypermnesia similar to the above cases and of the same mechanism. Hypermnesia sometimes persists in consequence of tetanus of the neurones and reveals itself by acts. Sigaud¹ reports cases in which fear caused by a serpent and a dog produced in the first case involuntary and spasmodic imitation of the movements of a serpent, and in the second case to imitation of barking. Likewise, the fear of madness can produce a syndrome in which all the symptoms of madness known to the subject manifest themselves. Dubois relates the following case: Two brothers were bitten by a dog not known to be mad. Shortly after the accident one of them left for America. The other died insane after his brother's departure. Returning to Europe twenty years later, the latter learned the name of the disease of which his brother died. This disturbed him so deeply that he fell sick and died with all the symptoms of madness.

I had under my personal observation, writes Dr. Kovalewsky, a case of *tabes dorsalis*, the cause of which was the fear of falling ill of this malady. The patient was decidedly neurasthenic from childhood, and during the last five years had undergone great misfortunes. His brother-in-law, father of eight children, died of *tabes*. The sight of this living corpse struck so forcibly the imagination of my patient that he had a constant dread of being seized with the same illness, the symptoms and development of which were well known to him by the sad case before him, and by the study of books. He was constantly watching for similar symptoms in himself. He soon felt pains in the back, and sudden and violent pains in the extremities, and unsteadiness in the gait. He could not stand with his eyes closed; pains round the waist, and disorders of the sphincters. After a careful examination of the patient, it became evident that the illness was of an illusionary character, which had been brought on by the dread of falling ill. In a month, under the influence of an anti-neurasthenic treatment, the patient completely recovered.²

¹Sigaud: De l'échomatisme, Thèse de Lyon, 1889.

²P. J. Kovalewsky: Folie du Doute, Jour. of Mental Science, 1887.

There are quite a number of cases of individuals bitten by healthy dogs, but believed by them to be mad, who have died within forty-eight hours in the height of furious delirium.

This brings us to the frontier of insanity which fear may cause. Whenever it does occur, it is the result, according to our author, of a combination of phenomena of amnesia and hypermnesia, or of phenomena of the interrupted and short circuits among the mnesic neurones. To the interrupted circuit, as already indicated, are due the loss of a large number of memories; to the short circuit, the various hallucinations, obsessions, and partial deliriums. Both are due either to tetanus of a certain number of neurones or to an excess of pressure among them.

On the other hand fear may cause the obsession to disappear and cure the insanity by diverting the nervous current from the neurones where the pressure is excessive and leading it to those where the pressure is nil, thereby revivifying their functions. Gregory tells of a man who being a prey to suicidal obsession walked towards Westminster bridge with the intention of throwing himself into the Thames. On the road he was attacked by an armed thief who threatened to kill him. He immediately abandoned his project and returned home delivered of his obsession. Professor James somewhere cites a similar case of a young lady who plunged into a stream with the intention of drowning herself. When a rescuer threatened to shoot her if she did not come out, she obeyed, and was freed of her morbid desire.

Distinction should here be drawn between the insanities due to fear, and the various morbid fears or phobias which are due to insanity or a diseased brain. In the one case a fear experience produces a persistent cortical disorder; in the other an original cortical disorder produces fear experiences. The mechanism in both cases may be the same or similar, but the initial causes are different.

The morbid phase of this subject has received considerable attention from alienists, and already there is quite an extensive literature covering almost every conceivable form of phobia, even the fear of the number thirteen which, in accordance with the learned custom, has been christened *triakadekaphobia*. Psychologists, particularly President Hall and Professor James, have also attributed much importance to morbid experiences, maintaining that they bring normal states into greater clearness, allowing us to view them through a micro-

scope, as it were, and to read in them the paleopsychic history which is faded in the normal soul. The analogy, however, is more striking than true, for more often disease acts as the concave, convex, conical, or cylindrical mirrors which distort the various parts of the body of the observer, elongating this part and shortening that, producing grotesque, anamorphic representations, but never bringing the whole figure, or any portion into greater clearness. It is doubtful whether a study of the numerous phobias can shed more light on the psychology of fear than intense normal fear experiences, but as morbid phenomena they are interesting in themselves, and we shall here give descriptions of the more common and important, and attempt an explanation of their origin.

PHOBIAS. Many writers have assumed as a general principle that all phobias are neurasthenics. M. Gelineau, however, who has made a most searching study of phobias, secondary phobias, and pseudo-phobias vigorously denies this, showing that there is very little in common between neurasthenics and phobias. Phobias, unlike neurasthenics, differ in no respect from normal individuals, with the single exception of their phobia. On all other subjects they are perfectly sane and their ordinary, everyday conduct betrays no evidence of such mental and physical disorders as obtain among neurasthenics. Phobics do not suffer from headaches, dyspepsia, genital frigidity, muscular weakness, rachialgia, insomnia, or hypochondria, as do the neurasthenics. What the origin of the various phobias is has not yet been discovered. Neurasthenia is undoubtedly a favorable soil for phobias, but not an absolutely necessary condition, as has been frequently supposed.¹ The most that can be said is that phobics are of nervous or exaggerated lymphatic temperament, and are generally the children of neuropathic parents.

Morbid fears were first studied by Westphal² who gave the name of *agorophobia* to the form of fear he was then considering, and among French writers on the subject Legrand du Saulle³ ranks first. Agorophobia is present when a patient feels intense fear that he will be unable to cross an open place, a broad street, church, theatre, large room, etc.

Therespiration becomes short, the throat is seized, as it were, by nippers.

¹ See E. Gelineau: *Des Peurs Maladies*, pp. 35-45.

² *Archive für Psychiatrie und Nervenk.* Vol. III, No. 1.

³ *Etude clinique sur la peur des Espaces*, *Annales Medico-psychologique*, 1878.

The heart palpitates, and becomes benumbed. The hands, feet and the whole body tremble. The knees bend. The patient can hardly keep from falling. He would cry out, but is deprived of his voice. He feels as if he were far away from the whole world; and has an everlasting feeling of intense horror; and at the same time he is perfectly conscious of the absurdity of what he feels. A trifling circumstance is often sufficient to free the patient from this dreadful state of fear—the presence of a child, be it even a year old, a passing carriage, a stick, an umbrella, the light of a lantern.¹

An excellent description of this phobia is given by Dr. J. H. Neale who describes his own case. He writes,

It might rightly be described as 'gastro-neurosis,' as I do not think I have met with a single case (my own included) in which there was not a previous history of long-standing dyspepsia. . . . My way home lay through Chalmers Street, a short, broad, lonely street ending in a *cul-de-sac* with a gate into the 'Meadows,' lined with gray, uncompromising-looking stone houses, the road so unused to traffic that the grass grew up between the stones. Walking briskly one evening down the slope I have my first attack, and it is the suddenness and unexpectedness of the first attack that is so alarming—a feeling that something dreadful is going to happen, that the end of all my strivings and longings has come. I stop; the heart seems seized in an iron grip. I feel as though I were going down into the earth and the earth were coming up to meet me. There is no semblance of giddiness or faintness in these attacks, it is more a feeling of collapse, as though one were being shut up like a crush hat or a Chinese lantern. I have a strong inclination to cry out and I feel that I must fall, so I lay hold of, and steady myself by, the palings. A deep heaving sigh, the breaking out of a cold sweat upon the forehead, and in less time than it takes to describe (a few seconds only), the attack has passed. Then quick as lightning comes the introspection and deception of the "agorophobic. Any one looking out of this window will think I am drunk, flashes through my mind, so I drop a book or stoop to tie a shoe-lace, and then hurry homeward, restored by the consciousness that I am not dead.

This "fear of impending death" is the worst symptom of the disorder. Next in order comes that from which it takes its title—viz., the dread of an open space; this is called up by the sensation of vastness, infinity and solitude. Then the inability to sit in the body of a church or a crowded meeting. All the time that I was an "agorophobic" I attended church regularly with my family, but we always sat close to the door. There I was safe; but several times when attending public functions, or when visiting I have been compelled to take a seat in the body of the church, an attack has come on, more especially when the organist, on any reference to lightnings or tempests has suddenly felt himself under an obligation to let fly every stop in the organ, and I have been obliged to hold on firmly to the back of the pew in front of me till the attack passed off. A sudden noise or a flash of bright sunlight upon a white pavement will induce an attack.²

Legrand du Saullé's case has become a classic. The subject was a lieutenant of infantry who, whenever he was in citizen's clothes, felt himself growing gradually weaker, and

¹ Kovalewsky: Folie du Doute, Jour. of Mental Science, 1887.

² J. H. Neale: Agorophobia, Lancet, 1898, 2, pp. 1322-23.

was seized with an undefinable anguish whenever he had to cross a large place, although when on horse, or in uniform with his sword at his side he could traverse the same road without any fear.¹

Dr. R. Jones offers an interesting case of a man who was the subject of a morbid dread and fear of something in the way of an accident happening to him, and could not move about without seeking protection or assistance from some one.

He (the patient) described his feelings at the summer picnic in the open park (where the patients assemble) as those of acute suffering the whole time. When in the middle of the park he was, he states, overcome with a feeling of intense misery and as if he would have fallen down, although he experienced no headache, giddiness, or dizziness. This feeling, he states, disappears as he gets 'near the trees or where there were plenty of people.' His feeling is further described as if he should 'fall down dead' unless he could lay hold of something. It is not the mental dread of the open place or the actual fear of the result of falling that seems to seize him, but the 'miserable suffering it produces.' He says he has never been able to stand on any open or high place owing to this feeling of 'suffering'—not because it brings on giddiness. To stand alone on the edge of a precipice or in the middle of a large plain would give him such agony (using his own words) that 'I would rather burn myself to death than do it.' He is fully conscious, he says, of the unreasonableness of this feeling, but he cannot with an effort of will which makes him 'tremble and perspire all over' rid himself of the anguish and tension that he is suffering.²

Closely akin to this form of fear is the fear of enclosed places,—a closed room, workshop, etc., which Professor Ball³ described under the name of *claustrophobia*, and Professor Raggi⁴ under the name of *clitrophobia*.

Beard groups all these cases under one heading *topophobia*, the fear of places. Other phobias are *monophobia*, fear of solitude; *anthropophobia*, fear of crowds; *panphobia*, fear of everything; *misophobia*, fear of dirt; *vikophobia*, fear to return home; *hypsophobia*, fear of heights; *botophobia*, fear of cellars; *astrophobia*, fear of lightning; *aichmophobia*, fear of sharp points, pins, needles, swords, fish bones, etc.; *thalasophobia*, fear of the ocean, common among inland people; *hematophobia*, fear of blood; *necrophobia*, fear of the dead; *bacillophobia*, fear of microbes; *siderodromophobia*, fear of travelling by rail; *pathophobia* and its many varieties, fear of disease; *zoophobia*, fear of animals; and with the aid of an English-Greek dictionary the list might be extended almost

¹ *Op. cit.*

² R. Jones: A Case of Agorophobia, etc., *Lancet*, 1898, 1, pp. 568-570.

³ De la Claustrophobie, *Annal. Medical Psychol.*, 1879.

⁴ La Clitrophobie, *Gazette des Hopitaux*, 1878, No. 49.

indefinitely, as any object or phenomenon may excite fear in a neuresthenic or psychopath. Brück cites the case of a clergyman who fell into a state of terror when his head was uncovered, but was free from fear whenever he was under a tree or an umbrella. Some patients have a morbid fear of shadows. A patient of Krafft-Ebing had a fixed fear of breaking her teeth.

I knew the case of a young lady, writes Dr. Kovalewsky, who was in a state of terror whenever she was in a carriage. She fancied that her mother and children were under the wheels.¹ I knew a lady, writes the same author, who during her pregnancy could not bear the smell of tobacco, and subsequently the sight of her husband, whose presence caused her to fall into a state of prostration and despair, and brought on vomiting. Soon after she feared water whilst washing or drinking, and soon after, the mere thought of water brought on fits of fear and anguish. Subsequently she could not bear the sight of her own hands. When she saw them suddenly, she used to have fits of agitation, anguish, fear, and despair. Such a state of things lasted the whole second month of her pregnancy.²

Dr. Kovalewsky reports another case of a female neurasthenic patient who having one day accidentally broken a glass bottle developed a fear of all glass objects, especially the sound of glass breaking which caused her to shriek and groan, and threw her into a state of terror.

She dreaded going into the street, full of fear of coming on pieces of glass. When, unfortunately, she saw a piece of glass, she made a wide circuit round it, but this did not save her from the necessity of examining and shaking out her dress, etc. When the patient looked out of the window into the yard, and some one broke a glass or anything else in an adjoining yard, she had for days long no peace of mind. She was terrified when she had to take medicine out of a glass bottle. She kept examining it to see that it was not cracked, and if a crack did exist, it caused her endless terror. Another misfortune soon added itself to the first. The patient began to be afraid of needles. She fancied that the end of the needle would break, fall on her dress, and thence enter the sexual organs. In consequence, before making use of the needle she used to examine it frequently, and, after having ascertained that the needle was whole, she nevertheless examined her dress and under-clothing.³

Gelineau cites the case of a lady whose dress was touched by a playful dog. She immediately imagined that the dog had bitten and poisoned her dress, that the dress had transmitted the virus to her petticoat, the petticoat to her chemise, the chemise to her skin, and that she would die mad. This fear continued for four or five months.⁴ Here, too, belongs

¹ *Op. cit.*

² *Op. cit.*

³ *Op. cit.*

⁴ Les Pseudo-phobies, *Revue de l'Hypnotisme*, 1893-4, 8, pp. 353-359

the morbid fear of forgetting something. The patient, who has been characterized as "the man with scraps of paper" has his pockets full of them, and thinking always on his troubles he notes them down almost every moment of his life. In the morning he carefully goes over everything that took place during the night, whether he slept well or not, the kind of dreams he had; then he examines himself from head to foot, repeating the same process in the evening. Distrustful of his memory he has a note-book crammed with observations on his appearance, appetite, pulse, perspiration, urine, memory, troubles, etc. There is always a fear of forgetting some circumstance even the most trivial, for should he forget it he would be lost in a labyrinth as complicated as it is full of his troubles.¹

Since there is no limit to the number of different forms in which morbid fear may express itself, and as all belong practically to the same category, Dr. Kovalewsky has wisely suggested the term *pathophobia* to cover all cases of morbid fear.

PSEUDO-PHOBIAS. In addition to these phobias there are a number of pseudo-phobias or strong aversions, the very thought of which make their subjects tremble. When they experience them their bodies grow cold, their countenances pale, the heart stops, and there is danger of syncope. Some feel as if they were struck in the stomach, and have a nauseating sensation which may cause them to vomit. The following examples are taken from the collection made by M. Gelineau.² Henry III, who was a brave king, could not bear the sight of a cat and never allowed one in his room, although he loved to be surrounded by dogs. The marshal of Brézé, having killed one of his valets in a forest, always fainted thereafter whenever he saw a rabbit. The morbid aversion to mice is quite common. The marshal of Albert swooned at the sight of a young wild boar that was being served at the table. The sight of a young ass made the Duke of Epernon lose consciousness. Vladislaus, king of Poland, fled whenever he saw an apple. Erasmus could not smell fish or duck's meat without having fever. Rousseau says that the smell of soup always made Mme. De Warrens feel ill. Scaliger trembled all over when he saw water cresses. Bacon fainted when he saw an eclipse of the moon. Bayle had convulsions when he heard the noise of water falling from a spout. Lamotte could not

¹ Gelineau: *op. cit.*

² Les Pseudo-phobies, *Revue de l'Hypnotisme*, 1893-4, 8, pp. 353-359.

endure the sound of any instrument. Favoriti, an Italian poet, could not bear the odor of a rose. Pierre d'Apono, a distinguished physician, was so frightened at the sight of milk and cheese that he fell in a faint. Meyerbeer would never visit a house in which there was a cat. James I, could not see swords drawn from their scabbards without paling and shuddering. These and similar cases confirm the observation of Montaigne: "I have seen men who dreaded the scent of apples more than arquebuses, others who were afraid of a mouse, others disgorged at the sight of cream, others on seeing a feather-bed shaken."

President Hall cites the following cases under different captions in his monograph,¹ but they may be properly grouped as pseudo-phobias.

Ever since a girl heard the word electricity, it has been the source of great terror; in the physics class she can never touch the brass knobs; she tried it once, but worlds would not tempt her to do it again, no matter how light the shock, 'they say batteries strengthen people, but I would die first.'²

A college teacher would gaze at a frozen lake till she feared to go crazy; on the train the sight of ice made her desperate; the sight of running water impelled her to do something to stop it.³

Another lady teacher was made sick and fearful of many ills by the sight of snow; another by bright sunlight and had to have a north room.

One girl has a special horror of moist hands, another of dry skin.

A boy states that his greatest fear is the noise of tearing cloth.

A woman writes that ever since she can remember she has shivered at points and edges. A young man has an innate horror of a knife, and dreads to see one handled. A man, otherwise normal, can never bear to have knives and forks at table point at him; it is the same with pins and pens. A boy of 18 shudders at sight of large knife or very sharp small one, and does not know how he can ever shave himself or be shaved. A young lady faints at every nose-bleed in school, every slight cut which she sees; cannot read of vaccination, or pass a surgical hospital, etc. Another always fainted at the sight of blood; cannot bear to see prominent veins anywhere; has difficulty in reading the word blood. A lady of 25 is sick at the sight of raw meat; cannot see it touched.⁴

The fear of blood or h ematophobia presents several varieties. Some cannot bear to see blood flow from a wound; others blood that has been shed. Some are only affected by the blood of others, remaining indifferent to their own hemorrhages. With still others the mental image of a bleeding wound is sufficient to produce the greatest pain. F er e cites the case of an h ematophobe whom the contact with a bloody scar threw into a state of syncope.

¹ A Study of Fears, *Am. Jour. Psych.*, Vol. VIII, No. 2, pp. 147-249.

² *Op. cit.*, p. 194.

³ *Op. cit.*, p. 233.

⁴ *Op. cit.*, pp. 233-234.

It is clear from the above cases that no sharp line of demarcation can be drawn between normal and morbid fears. Béard tells of a priest who when he had to counsel his penitents at confession grew pale, shuddered, and worried himself frightfully at the thought of his responsibility. Another patient, otherwise normal, would not travel because of a fear of falling sick on the way, and being left without help. Another will travel by a roundabout route in order to avoid passing a tunnel. Some cannot fall asleep in a dark room without much trouble and anxiety. Some have a constant fear of misplacing medicines, dropping banana peels, opening the door to burglars instead of callers, etc. Many of these subjects are the heads of large business establishments and not a few have attained fame in art, literature, science, and government. The most that can be said is that when the fear has no objective basis, the subject being conscious of its absurdity, or when it is so persistent that it materially interferes with his rational behavior, it is pathological. Neurologically, these phobias can best be explained by postulating the existence of *loci minor resistentiae* in neuropathic brains which do not offer normal resistance to nervous currents and therefore find themselves in a state of constant excitation and irritation. The various forms are due to the different neurones which are affected, and perhaps, to the different initial experiences which provoked fear. They are closely analogous to obsessions and imperative ideas, and have as little in common with normal fear experiences as the latter have with rational thinking.

3. PHENOMENA OF HYPERTONUS. Returning now, after this slight digression, to the work of M. Binet-Sanglé, we have next to consider what he calls, phenomena of hypertonus. If a certain number of muscles are paralyzed by fear as a result of a broken circuit, there are other muscles which are made to function hypernormally owing to a short circuit. Mosso found with the aid of the ergograph an increase of muscular activity from 4.35 to 5.95 kilogrammetres due to fright. The hypertonus of the muscle which raises the upper eyelid, and of the frontal muscle which creases the skin of the forehead transversely, together with the parietic phenomena already mentioned contribute to create the facial expression characteristic of fear. There is further an attitude of fear due in part to the hypertonus of the flexors of the trunk, the flexors, adductors, and pronators of the members. The trunk bends forward, the head is inclined and sunk between the

shoulders which are brought together, the arms are placed over the chest, the lower members come together, the thighs bend over the pelvis, and the legs bend lightly on the thighs. This attitude, our author maintains, is very serviceable for the protection of the organs essential for life. The inclined head conceals the eyes, nostrils, mouth; protects the œsophagus, the trachea, and the vessels and nerves of the neck. The inclined trunk conceals the inter-costal spaces, closes with the aid of the thighs the abdominal cavity, and protects the viscera. The members in adduction, flexion, and pronation conceal the vessels and nerves of their posterior and anterior surfaces.

This contracting and shrinking attitude is also observed among the lower animals. The trilobites, glomerids, various isopods, the chitons, the armadillo, and the pangolin roll themselves up and present their impenetrable surfaces to the enemy. The mollusks close their valves or re-enter their shells. The tortoise disappears in his carapace. The partridge rolls himself up. With the dog, the ears drop and the tail is tucked between the legs.

The hypertonus of fear affects other muscles than those involved in the production of the above attitudes. By the establishment of a short circuit among the motor neurones controlling the muscles of the life of relations, fear enables animals to escape from danger. It gives them legs or wings.

Muscles of the digestive apparatus. Phenomena of the short circuit appear more frequently in the vegetative functions than phenomena of the interrupted circuit. There is frequently observed a spasm of the pharynx or of the œsophagus which interferes with deglutition; also a spasm which produces a sensation of constriction in the epigastrium and even nausea and vomiting. The peristaltic movements of the intestines increase in intensity and rapidity, which coupled with intestinal endosmosis of vaso-paretic origin provokes colic, diarrhœa, and the need of defecation. There are many vulgar phrases which bear witness to the influence of fear over the digestive and intestinal functions.

Similar phenomena are observed in the lower animals. Under the influence of fear, *Holoturia Forskali* expel by the cloacal orifice from five to eight balls of glutinous filaments. Crabs eject through the anus a volatile liquid of a repulsive odor and secreted by special glands; the bombardiers (*Brachymus crepitans*, *B. explodens*, *B. sclopeta*) eject an acidulous and burning liquid which vaporizes immediately, producing a very

perceptible detonation; the polecat, the offensive badger, and the weasel (*Mephitis*) eject a liquid of extremely offensive odor. In the case of the lower animals these secretions have value as a means of defence; in the case of man they are atavistic functions which have lost their value and become very disagreeable and of positive disservice.

Muscles of the respiratory apparatus. Fear produces an acceleration of the respiratory movements which is often preceded by a violent spasm of the inspiratory muscles. A deep inspiration results; the mouth opens, the nostrils dilate, and this may continue for many seconds, after which there is an increase in the rapidity and amplitude of these movements with suppression of the pauses. Mosso has registered with the aid of the pneumograph thirty-four respirations to the minute in a subject under the influence of fright. This respiratory phenomenon is accompanied by a sensation of oppression or stifling. "My heart leaped into my mouth" is the popular description of this disturbance. At the same time it produces a contraction of the glottis sometimes sufficient for the deep initial inspiration to be accompanied with a sharp cry. This contraction also determines the elevation of the voice which singers suffering from stage-fright manifest.

Muscles of the circulatory apparatus. In three-fifths of the cases, according to Binet and Courtier, the heart-beats increase rather than decrease in force and frequency. This is due to a short circuit among the neurones which control the cardiac filaments of the sympathetic. Mosso found with the aid of the cardiograph an increase from 78 to 136 beats, and Binet and Courtier observed the pulse pass from 78 to 87 at the cry of fire, and from 70 to 95 under the influence of moral anxiety. The sensation of pressure and cardiac heaviness which is observed in anxiety and which has given rise to such expressions as "My heart sank in my boots," "I felt my heart sink," etc., is undoubtedly due to phenomena of hypertonus. The increase of activity of the heart is accompanied by an increase of urinary secretion and plays a rôle in the frequency of micturition.

Vaso-constrictors. A short circuit among the neurones which control the vaso-constrictor filaments of the sympathetic causes the vessels to contract. It is to this vaso-constriction that the pallor of the skin and the sensation of cold and

chills, the "freezing of the blood" are due. Here, too, we discover why fear sometimes stops an hemorrhage.

Muscles of the excretory apparatus. Fear can produce a contraction of the muscles of the bladder which will cause involuntary micturition, or retention and tenesmus if the contraction takes place in the sphincter.

Lachrymal glands. Hypertonus of the lachrymal glands produced by fear gives rise to tears.

Sudoriporous glands. Fear often produces a contraction of the muscles of the sudoriporous glands, and an abundant excretion of perspiration follows. This very sudden perspiration, due perhaps to a trophic action on the secretory cells, is popularly described as "cold sweat." The perspiration is abundant especially on the hairy parts and the hands.

Salivary glands. Mosso has also observed an increase of salivation.

Muscles of the genital apparatus. Fear can produce abortion. Schmidt and Ménard, who were in charge of the military hospital at Landeau in 1793, at the time of an explosion in the arsenal, reported that of the eighty-two children who were born in the months which followed the accident, sixteen were born prematurely and died at birth, twenty-two were born with fractures of the long bones, eight fell into a sort of cretinism and died before the age of five, thirty-two languished on till eight or ten. Bandelocque reported that during the eight days following the explosion of the powder factory at Grenelle he was called to sixty-two women in labor or in a state of abortion, and that the majority of the fœtuses died.

4. PHENOMENA OF HYPERTROPHISM. Velpeau observed the disappearance of an abscess, and Escoubas the cessation of an urethral draining due to fear.

Practically all the organs and functions which can be affected by fear have now been considered, and an attempt has been made to explain the physiological and neurological mechanism of each. It remains to remind the reader what has already been mentioned in the first chapter, namely, that the neurological and physiological modifications vary with the individuals. In some, fear produces analgesia, in others algesia; sometimes it produces aboulia or paraplegia, sometimes the most rapid flight; sometimes dilatation, sometimes the contraction of the glottis; in some vaso-dilatation, in others vaso-constriction; sometimes the diminishing or arrest of the

heart-beat, sometimes its acceleration; in some the diminution of salivation, in others its augmentation; sometimes the whitening of the hair; sometimes the change of pigmentation of the skin; sometimes the lowering, sometimes the raising of the temperature, etc. The exact nature of the modification depends on the constitution of the subject's neurones or nervous system, the intensity of the fear and the importance of its objective cause. Age, sex, constitution, temperament, state of the organism at the time, disease, intoxication, fatigue—all are important factors in determining the nature and form of fear. Even among brothers and sisters reared under almost the same conditions, some are cowardly while others seem fearless. The same is true of the different races of man and indeed of the whole animal kingdom.

"Among insects, contrast the timid horsefly with the audacious and predatory midge; among reptiles, the armed and predatory crocodiles and alligators, the python, boa-constrictor, the cobra, with the comparatively defenceless and fugitive turtle and tortoise, and the harmless lizards and snakes; the amphibia—frogs, toads, newts, and salamanders,—are nearly all timid, waking to seek for food for the most part at night; among fishes contrast sharks and swordfish, perch and sticklebacks, with the inoffensive cod and salmon, haddock and trout; and among birds the aggressive eagle, hawk, owl, and bat, with the defenceless doves, crows, sea-gulls, and sparrows. Among mammals, the carnivora are the aggressives, and the herbivora the fugitives. . . . Through all nature, then, the fitness by which the species survive is, in some cases, a power of offence associated with a character that includes courage, audacity, ferocity, readiness to attack, and in others, and I think, the vast majority, a physical defencelessness, associated with caution, timidity, constant watchfulness, and a readiness to escape. To us, to the human consciousness, these diversities have descended. There are men and women amongst us not unfitly described by the slang that designates them as sharks, people who are always on the pounce; some of them aggressive in manner, many of them bland and sly, yet none the less predatory, bent upon turning everything and everybody to advantage; whose outlook on the world is as a place to acquire property, place, and power, and who regard every neighbor as fair game. And there are others in hosts who are mostly afraid—unassuming persons both in manner and character, whose chief desire they share with the rabbit—just to be left alone, and who suggest in their suspicion and anxiety, the apparent state of mind of the coy and prudish cow. These are not mere resemblances, not unmeaning analogies: they are identical qualities determined by the same kind of blood and nerves, evidence of functions, structures, and instincts which have been evolved in the hard struggle for existence and have been transmitted to us from the loins of the brute creation as surely as our eyes, our lungs, our hearts."¹

From the neurological point of view, then, the whole subject of fear reduces itself to a matter of neuronic conditions, combinations, and permutations.

¹ Wilson: *The Sense of Danger and Fear of Death*, *Monist*, 1903, pp. 352-369.

Mention should be made, before bringing this section to a close, of Darwin and Mosso. To Darwin belongs the credit of having been among the first to analyze scientifically the expression of the emotions, and while some of his teleological explanations are now rejected, his work will always have historical value at least, because of the great impetus it gave to the study of the emotions. Mosso's excellent monograph on Fear is already familiar to every student of psychology, and will long stand as a model of scientific work. His more important results have already been given in this chapter, but not his description of his own fear experience, a description which has no equal in literature. It summarizes so very many of the fear phenomena and so graphically that we shall conclude by quoting it in full.

All I had to do was to communicate the results of some of my investigations into the physiology of sleep, and yet, as the hour drew nearer, stronger waxed within me the fear that I should become confused, lose myself, and finally stand gaping, speechless before my audience. My heart beat violently, its very strings seemed to tighten, and my breath came and went, as when one looks down into a yawning abyss. At last it struck eight. As I cast a last glance at my notes, I became aware, to my horror, that the chain of ideas was broken and the links lost beyond control. Experiments performed a hundred times, long periods which I had thought myself able to repeat word for word—all seemed forgotten, swept away as though it had never been.

My anguish reached a climax. So great was my perturbation that the recollection of it is dim and shadowy. I remember seeing the usher touch the handle of the door, and that, as he opened it, I seemed to feel a puff of wind in my face; there was a singing in my ears, and then I found myself near a table in the midst of an oppressive silence, as though, after a plunge in a stormy sea, I had raised my head above water and seized hold of a rock in the centre of the vast amphitheatre.

How strange was the sound of my first words! My voice seemed to lose itself in a great wilderness; words, scarce fallen from my lips, to tremble and die away. After a few sentences jerked out almost mechanically, I perceived that I had already finished the introduction to my speech, and discovered with dismay that memory had played me false just at that point where I had thought myself most sure; but there was now no turning back, and so, in great confusion, I proceeded. The hall seemed enveloped in mist. Slowly the cloud began to lift, and here and there in the crowd I could distinguish benevolent, friendly faces, and on these I fixed my gaze, as a man struggling with the waves clings to a floating spar. I could discern, too, the attentive countenances of eager listeners, holding a hand to their ear as though unwilling to lose a single word, and nodding occasionally in token of affirmation. And lastly, I saw myself in this semi-circle, alone, humbled, discouraged, dejected—like a sinner at confession. The first greatest emotional disturbance was over; but my throat was parched, my cheeks burned, my breath came in gasps, my voice was strained and trembling. The harmony of the period was often interrupted in the middle by a rapid inspiration, or painfully drawn out, as the chest was compressed to lend force to the last words of a sentence. But to my joy, in spite of all, the ideas began to unfold of their own accord, following each other in reg-

ular order along the magic thread to which I blindly clung without a backward glance, and which was to lead me out of the labyrinth. Even the trembling of the hands which had made me shake the instruments and drawings I had from time to time to exhibit, ceased to last. A heaviness crept over my whole body, the muscles seemed to stiffen, and my knees shook.

Towards the end I felt the blood begin to circulate again. A few minutes passed of which I remember nothing save a great anxiety. My trembling voice had assumed the conclusive tone adopted at the close of a speech. I was perspiring, exhausted, my strength was failing; I glanced at the tiers of seats, and it seemed to me that they were slowly opening in front of me, like the jaws of a monster ready to devour me as soon as the last word should re-echo within its throat.¹

¹ Mosso: *Fear*, pp. 1-4.

CHAPTER III.

INSTINCTIVE, SENSATIONAL, AND IDEATIONAL FEARS.

The reader will have already observed that there is a great variety of fears differing from each other as do species belonging to the same genus. These fears may be classified either objectively according to the objects which provoke them, or subjectively according to the psychical elements which predominate in them. The latter is the psychological method, and the one which will be employed in this chapter. We shall treat of (1) fears in which instinct plays the chief rôle; (2) fears which are caused by some painful sensation; (3) fears due to some painful or disagreeable idea or belief.

INSTINCTIVE FEARS.

That there are fears due to painful experiences, physical and psychical, no one denies, but that there are also fears which are not due to an individual's own experience, but are inherited or instinctive is still a matter of dispute, and modern psychologists are almost unanimous in denying their existence. All that is inherited, they maintain, is "an innate capacity for motor response" to certain stimuli. If these stimuli are painful they will give rise to fear reactions, but there is no knowing in advance which stimuli produce pain and which do not, therefore there are no innate fears of certain objects as such. For example, the young chick or turkey has no instinctive fear of hawks, or the cry of hawks, as Mr. Spaulding thought, but will utter the characteristic danger churr, scatter and crouch down

at any loud, strange, and unusual sound, or on sight of any alarming object. If I threw a large piece of screwed-up paper among them, (chicks) if I sneezed, or clapped my hands, or played a sharp chord on the violin, down they dropped; and I do not think they had any inherited acquaintance with violins. On the other hand when I took one of the chicks two days old to the cat, there was not the smallest sign of fear. The little bird took no notice of the cat. Nor did the cat take any notice of the bird, so long as I held it in my hand. When I placed it on the floor she seemed inclined to go for it; but the bird remained unaffected.¹

In another place the same author writes:

I have found that pheasants, partridges, plovers, domestic chicks,

¹Lloyd Morgan: Intro. to Comparative Psych., pp. 202-203.

and other young birds, hatched in an incubator, show no signs of fear in the presence of dog or cat, so long as the animal is not aggressive. If approached gently, in the absence of their parents, callow wild birds in their nest exhibit little alarm at the slow and gentle approach of man.¹

Mr. Hudson, in his well-known work,² devotes a whole chapter to proving that in birds there is no instinctive fear of man, as has been commonly supposed.

I have frequently walked quite openly to within twenty-five or thirty yards of a flock of flamingoes without alarming them. . . . Sparrows in England are very much tamer than the sparrows I have observed in desert places, where they seldom see a human being. Nevertheless, young sparrows in England are very much tamer than old birds, as any one may see for himself.³

He finds no instinctive fear of man in the rhea, or South American ostrich which is a very ancient bird, and

must have been systematically persecuted by man as long as, or longer than, any bird now existing on the globe.

After citing many other species which show no instinctive fear either of man or of any of their enemies, Mr. Hudson concludes:

I think I am justified in believing that fear of hawks, like fear of men, is, in very nearly all cases, the result of experience and tradition. Nevertheless, I think it probable that in some species which have always lived in the open, continually exposed to attack, and which are preferred as food by raptors, such as duck, snipe, and plover, the fear of the falcon may be an inherited habit. Among passerine birds I am also inclined to think that swallows show inherited fear of hawks. Swallows and humming birds have least to fear from raptors; yet, while humming birds readily pursue and tease hawks, thinking as little of them as of pigeons or herons, swallows everywhere manifest the greatest terror at the approach of a true falcon; and they also fear other birds of prey, though in a much less degree. It has been said that the European hobby occasionally catches swallows on the wing, but this seems a rare and exceptional habit, and in South America I have never seen any bird of prey attempt the pursuit of a swallow. The question then arises, how did this unnecessary fear, so universal in swallows, originate? Can it be a survival of a far past—a time when some wide-ranging small falcon, aerial in habits as the swallow itself, preyed by preference on hirundines only?⁴

The question is left unanswered, but we are inclined to reply in the affirmative, not only for this particular bird, but for those animals in which the various instincts ripen to perfection without exercise or training, and which manifest fear of

¹Lloyd Morgan: *Animal Behavior*, pp. 110-112.

²*The Naturalist in La Plata*, 3rd. ed., London, 1895, pp. 83-100.

³W. H. Hudson: *op. cit.*, p. 84.

⁴*Op. cit.*, pp. 98-99.

natural enemies without imitating or receiving any clue from their parents, such as the Talegallus, a well-known species of brush-turkey, and the bat, for example.¹ In a similar way we would explain the morbid fear of fire manifested by the horse, and in man, the fear of high places, thunder and lightning, darkness, solitude, reptiles, certain wild and domestic animals, fire, water, etc., which cannot be adequately explained by imitation, experience, or the nature of the stimulus. To affirm on the one hand that there is organic continuity stretching back from the highest to the lowest forms of life, as is evidenced in embryogeny and by the many rudimentary organs in man, such as the gill slits, pineal gland, vermiform appendix and 120 others, and to deny on the other, that there is such continuity in the psychical history of the race is to willfully blind one's self to one half of the psychophysical universe and to think meanly of the soul. That we have inherited organisms which have been shaped and determined by æons of varied experiences and under conditions which have long ceased to exist, but which have left their indelible impressions, and at the same time that we inherit blank, indifferent, unmarked consciousnesses or perhaps, no consciousness at all, is to us, at least, unthinkable. By this we do not mean to express a belief in the inheritance of definite, concrete psychical experiences, but rather of general or generic experiences which may either fade out of existence or become definite and concrete according to the life conditions of the individual. A kitten reared with a puppy may become fast friends with it, but that does not disprove the fact that there is an innate animosity between the two tribes. Birds and animals reared from birth by man may show no signs of fear of man, but it would be rash to conclude that such birds and animals have no instinctive fear of man. It is very probable that the instinct failing to receive its proper stimulus at the proper time, or being counteracted by other forces, slowly starved to death, so to speak.

This may be true of the fear of darkness, for example, which in children of intelligent parents is absent or very weak. But the fact that children can be so very easily frightened in the dark, that the fear of darkness is so contagious, and that when once experienced it persists for many years is indicative, it would seem, of an inherited psychical tendency to fear the

¹See W. H. Hudson: *op.cit.*, pp. 87 and 104.

dark. One or more early fear experiences are hardly sufficient to account for the strength and persistence of the reaction. There is much evidence, as we shall see, that the mind, too, has its scars, its *loci minor et major resistentiae*, as well as the body. The case of Lloyd Morgan's chicks and birds which manifested no fear in the presence of a motionless cat or dog merely shows that they have no instinctive fear of *motionless* cats or dogs with which their whole ancestry has had no experience; it does not show that they have no fear of living, active cats and dogs, the only kind that need be feared. Of course, those who are under the influence of materialistic monism cannot admit the possibility of a continuous psychical evolution which parallels organic evolution step by step, and is neither less nor more mysterious than it, but for those who are neither duped by an adolescent idealism nor moved by the violent materialistic reaction thereto; who take a common sense, realistic, every-day, unlabored point of view, the above hypothesis presents no difficulties and no need is felt to juggle with facts.

The following cases taken from President Hall's most comprehensive study on Fear¹ are cited as examples of human instinctive fears.

FEAR OF HIGH PLACES AND FALLING.

F., 12. Could only go up a high elevator by having a handkerchief tied over her eyes; when at the top she trembled and felt like leaping down till blindfolded again.

F. A young Scotch lady has such dread of falling that she can never go up or down stairs when it is dark, and never except very slowly; for the same reason she could never learn to skate, and often in slippery weather stands still and cannot take a step; she once tried rolling down hill with other girls, but trembled for an hour; can do nothing on gymnastic apparatus; is never giddy, and never had a bad fall.

F., 23. Almost faints to see others on high places.

F. Can never cross a ravine or high bridge nor sleep in an upper story.

M., 17. Is almost as afraid to look up as down heights.

F. A mother says her eight children have always been intensely excited on being lifted towards the ceiling.

Quite a number are fascinated by high places and felt an almost irresistible impulse to jump off in order to experience the sensation of falling through space.

F., 16. Has no fear of falling from high places, but the impulse to throw herself down is so intense she must strain every muscle to get away, and must often call for immediate help; often there is a sense of smothering.

F., 17. Describes the same impulse in order to see how it feels going down, and is exceedingly curious to know how it would feel to fall very far.

F., 13. At the top of a high building was irresistibly impelled to

¹G. Stanley Hall: A Study of Fears, *Am. Jour. Psych.*, Vol. VIII, No. 2.

squeeze between the bars of the railing to see if one could fall to the pavement; is sure she would have landed there if she had not been held, and describes it as an outside power forcing her against her will, as very terrible and conquering her control.

F., 18. Can never look out of a window above the first floor without feeling she must jump to get the beautiful sensation of dropping through the air; she is not dizzy, but has a sinking feeling at the heart.

M., 11. When on a high place always wants to try to fly off.

M., 31. Is sometimes impelled to sacrifice all when on a high place to get the exquisite pleasure of dropping, with a wild feeling he might be borne up a little, or strike a soft spot.

President Hall suggests that this fascination or charm may be a vestigial, psychical trace of the experiences our ancestors had during the many æons that they floated and swam and had a radically different mode of breathing.

The fear of falling is a vestigial trace dating back to the time when our swimming ancestors first developed limbs and had not yet learned to use them safely.

Mr. Wesley Mills, however, states that a turtle has no fear of high places for it will walk off any elevated support again and again, and a frog will jump almost anywhere.¹

The desire to experience new sensations and the impulse to take a risk, so strong in some, may be elements in the total complex, but there seems to be something back of these, and more fundamental, which justifies us in classifying them as instinctive. In the other fears of falling, the feeling of insecurity with its accompanying change of bodily sensations, and the newness of position and environment are undoubtedly exciting factors, but in addition to these there is an unmistakable gravity fear which is most clearly manifest in young children.

FEAR OF LOSING ORIENTATION.

F., 21. Never has suffered from any other fear so great as that of getting lost or turned around in bed; in every strange place this fear keeps her awake; she has always been haunted with fear that she should lose her way from school and go off in the wrong direction, although the ground was very familiar; the fear of getting the wrong classroom always haunts her; she can never enter the smallest forest, and can never turn a corner or curve without fearing it is wrong and painfully fixing the angles in her mind.

M., 12. Suffers from the constant fear of losing the points of compass in the city or country.

F. An English woman is haunted by the thought of losing the points of compass in some wood; it is accompanied by a sickening sensation, and sometimes by the fear of dying alone of starvation.

The phylogenetic element in these cases is too evident to

¹ The Study of Fear, Science, 1897, p. 153.

need pointing out. Personal experience is certainly too inadequate to explain them.

FEAR OF CLOSENESS.

M., 28. Cannot endure a closed carriage; it is not the riding, but the being shut up.

F., 36. Hates all small rooms; must have windows if not doors open; can never enter a room if the key is on the outside; if she does so must make great effort to breathe.

F., 18. Hates caves, ravines, gorges and all narrow places, and is oppressed in every forest so that she cannot draw a long breath.

M., 16. Colored. Most of all fears to be shut in; if a door must be locked he must be the one to lock it; "I still feel the same sensations about everything that limits my freedom, and want to shout like Patrick Henry, 'Give me liberty or give me death.'"

FEARS OF CELESTIAL OBJECTS.

F., 16. Always shudders when looking at clouds; she used to trace outlines of terrible monsters, has still the same feeling even when looking at pictures of clouds, another used often to run in from play in terror from cloud shapes; she would watch their changing forms with breathless fear.

F., 18. Had a horror of clouds that were stacked or piled, one above another; if they were black she feared they would burst and spread destruction; she could never endure clouds directly overhead.

M., 5. Is frightened at every little cloud; he always watches the sky, and if he sees one coming over runs in.

F., 5. For months had a horror of clouds, and was haunted with the fear of raindrops, when they fell she was always gloomy and in terror.

M., 23. Had mental terror of a yellow sky, clouds or light; red in the heavens suggest blood and something terrible to come; a college professor, as a child, had horror of red sunset, "the sun seemed coming down to the earth to set it on fire."

A lady writes in one of the popular magazines:

Once as a very little child, I was for some reason alone in a wide, treeless place in the country. I suppose I was in reality not far from the house, but there seemed to me an endless expanse around. As I looked about me I suddenly became conscious of the overpowering immensity of the sky and its awful unbroken blueness. A crushing horror and dread seemed to pin me to the ground. I stood, a shuddering mite of a girl, alone under that stupendous weight of blue, feeling that it might descend and swallow me up. I have forgotten everything but that,—how I came there, how I got away; but I know now the precise shade of the terrible intense blue that seemed to be engulfing me.

F., A high school teacher never feared celestial phenomena except northern lights, these still give her an indefinable feeling of horror, and she never sees them without shivering or shaking.

M., 4. Watched an eclipse, and as the moon grew dark cried with terror and could not look again.

F., 7. Cried with alarm thinking some one had blown out the sun.

M., 18. At 3 had great terror of the full moon, and would always run and yell to get away from it.

F., 16. Loved to watch the moon, but could never do so alone, fearing the real man there might come down and carry her off; she still has this fear.

F., 30. While hearing stories on the verandah one night as a girl, saw the moon break out and suddenly tint everything with silver; this, she thought, is the end of the world, even yet she cannot see the moon break through a rift in the clouds without some fear.

F., 10. Was looking at the moon and thought it smiled at her, and ran in terrified.

M., 18. Used to when small have panics at his own shadow, tried to run away from it, stamp on it, and thought it might be his soul.

F., 19. When small had horror of red sunsets, which she thought would set the world on fire.

F., 17. The most "shuddery" thing in all the world is the northern lights, they seem to go through her so.

M., 12. Had persistent fear of meteors, of falling stars, which he connected with the end of the world.

It is interesting to note in connection with these fears the changes that take place with age. In the earliest years, these fears, if present, are of a sensational nature, *i. e.*, they are excited by new, strange, or sudden sensations, or by objects never before experienced and therefore mysterious and fear inspiring. Later, when the stage of development attained by primitive man has been reached, when imagination begins to function, the child invests celestial objects with symbolical meaning, weaves myths about them, foretells its own fate and that of the world by them, and in its own childish way prays to and worships them just as our primitive forebears did. Sky, clouds, sun, moon, rainbow, meteors, comets, balls of fire, twilight, northern lights, sunsets, shadows, etc., are feared, not because of what they are nor because of the sensations they produce, but rather because of the new and terrifying thoughts they suggest and give birth to. The phyletic psyche which has now come to the surface is touched off, so to speak, by these celestial phenomena causing it to burst forth like a many colored sky-rocket.

Children's souls, writes President Hall, still show abundant traces of the original psychoplasm out of which primitive man created the many fairy or demonial beings seen in cloud, fog, and all the phenomena of day and night.¹

Still later in life, when reason has supplanted childish imagination, these fears, when present, are again due to the painful sensations they excite.

FEAR OF DARKNESS.

M., 15. When younger used to fall into panic at shadows, and would run out of breath to get away from it.

F., 9. Can never sit on her piazza at night without hugging up to and holding some one from fear.

¹ *Op. cit.*, p. 177.

F., 22. The cedar trees near by looked like men and were always fancied to be such; she can never go into a dark room without feeling chills and quivers, and then flushing.

F., 19. Always pretended to be fearless of the dark, and would often go up stairs without a light, but if she touched a buffalo robe always had to scream with fear till some one came to her relief.

F., 17. Can enter a dark place with composure, but the moment she turns her back to come out she has the horrors, must generally run, and sometimes scream.

F., 17. In a dark room feels some one looking at her from the corners and pursuing from just behind.

F. An English woman has the idea of a long hand stretched out to seize her, often imagines herself actually touched, pictures "indescribable evil personages" each side of a long, dark staircase, and her joy at seeing light again is very vivid.

F., 23. Till 8 never went down cellar even by day; till 12 never dared to go to the barn after dark; till 15 could never go to bed in the dark; till 17 could never step over to the next neighbor's; to do each of these for the first time was an epoch.

Richet's account of his fear of darkness deserves to be added here.

About ten years ago, when I was in Baden, near the Black Forest, I was in the habit of walking alone in the evening till late in the night. The security was absolute, and I knew very well that there was no danger; and, as long as I was in the open field or on the road, I felt nothing that resembled fear. But to go into the forest where it was so dark that one could hardly see two steps ahead, was another thing. I entered resolutely, and went in for some twenty paces; but, in spite of myself, the deeper I plunged into the darkness the more a fear gained possession of me which was quite incomprehensible. I tried in vain to overcome the unreasonable feeling, and I may have walked on in this way for a quarter of an hour. But there was nothing pleasant about the walk, and I could not help feeling relieved when I saw the light of the sky through a gap in the trees, and it required a strong effort of the will to keep from pressing toward it. My fear was wholly without cause. I knew it, and yet I felt it as strongly as if it had been rational. Some time after that adventure, I was travelling at night, alone with a guide in whom I had no confidence, in the mountains of Lebanon. The danger there was certainly much greater than around Baden, but I felt no fear.¹

Only two cases in all our returns, writes President Hall, report complete exemption from this fear. Often in the best born and most carefully shielded and healthy children, they break out suddenly on the slightest suggestion or none at all, and overwhelm all control, predispose to or actually cause deep-seated nervous disorders.²

Darkness is the most favorable condition for the play and development of the imagination, but why should children born in civilized communities and shielded from all danger imagine all sorts of horrible and dangerous things instead of pleasant ones? The most obvious answer is that given by our author,

¹ Charles Richet: *A Psychological Study of Fear*, Pop. Science Mo., 1886, p. 776.

² *Op. cit.*, p. 186.

namely, because painful experiences at night have been very much more numerous and intense in the history of the race than pleasurable ones, and being stronger they more readily excite the nascent imagination of the child.

Children who gloat over horrors may be instinctively applying strong stimuli to develop the rude, early stages of imagination, as we pinch ourselves to keep awake.

We must go back of this to explain fully both the fear diathesis and some special fears. It is just in these drifting automatic states so favored by darkness, and sometimes even by fatigue, when the imagination is laying the basis of mind and first divorcing thought from sense that the soul feels the pain of its old scars received in the long struggle by which intelligence unfolded out of instinct and instinct out of reflexes. In the past the pain field has been incalculably larger than the pleasure field, and so potent is this past that its influence dominates the most guarded child, in whom otherwise the pleasure field should be relatively the largest anywhere to be found. Now, darkness and the unknown alike have few terrors; once they had little else. The old night of ignorance, mother of fears, still rules our nerves and pulses in the dark despite our better knowledge. Lacking this latter, children fall still more abjectly under her spell. Hence it is that animals found only in distant lands or long extinct, robbers, impossible monsters, ghosts, etc., rarely present, and never feared in waking consciousness, bear witness again to the remoteness of the past to which some of the roots of this class of fears penetrate.¹

FEAR OF SOLITUDE.

F., 22. Up to 16 could never be left alone, and never was. I was not usually afraid, but had a lonely feeling that was simply dreadful.

F., 17. From about 8 to 12 had a horror of even momentary solitude; *e. g.*, in picking berries, if for an instant she lost sight of her mates, she would scream and sometimes lose consciousness.

F., 21. Has always loved to wander off into lonely places in the country, yet sometimes a creepy feeling of solitude springs upon her and she is almost paralyzed with dread.

F., 23. All through her school days had a nameless dread of being left alone in the house, as she often was; everything within seemed gloomy and awful. Every few minutes she would go out and look every way to see if some one was not coming. Every effort at diversion was vain. The clock ticked so loud that she could feel the silence, which almost stunned her. "I felt as if everybody was dead. I would sing and do the most unusual things, watch the clock, the approach of night, dread every preposterous accident, seek companionship with the animals in the barn, and even with the flowers in the garden."

Stillness, which frequently accompanies solitude, the absence of customary stimuli, which renders the situation strange and gives free rein to the imagination are undoubtedly factors in the production of these fears, but more deep-lying and pre-disposing are the ancient psychic traumata suffered by our gregarious animal forebears whenever they found themselves separated from their groups.

¹Hall; *Op. cit.*, p. 189.

SENSATIONAL FEARS.

To avoid misunderstanding we repeat that this classification of fears as instinctive, sensational, and ideational is somewhat an arbitrary one. We do not mean to imply that the fears listed as instinctive are purely such and need no external stimuli to excite them, nor that the fears grouped under this caption can be wholly explained by the painful sensations experienced. In each group there are elements found also in the others; only in the first, instinct seems to predominate; in the second, sensation; and in the third, ideas.

President Hall, wishing to present his recapitulation theory as forcibly and convincingly as possible, has over emphasized the instinctive element in some of the fear experiences he has collected. The theory is indeed interesting, full of suggestiveness, and rich in truth; for many of the cases it offers the best possible explanation, but, like other theories it may be overburdened and made to apply to cases it does not fit. It seems almost impossible for expounders of theories to avoid developing hypertrophied apperceptive organs and excessive love for the children of their intellects. They see applications of their views where they do not exist, sometimes facts are twisted or ignored, explanations are absurdly forced and half truths made to do the service of whole truths in the interest of theory. They seem to forget that it is possible to dig deeper than is necessary and, perhaps, than is safe for the foundations of their theories. Instincts certainly play an immense rôle in human consciousness, but it is impossible to reduce by a process of devolution or involution the sum total of human consciousness to instincts, as another recent writer has attempted to do.¹ In the evolution of mind there have been many spontaneous variations, many leaps and bounds, leaving bridgeless gaps, before which we must halt when we retrace the course of evolution. Enthusiasts, however, build artificial bridges and bid us pass over, but they are less and less listened to, now that de Vries and others have exploded the Darwinian theory of gradual evolution. It should be remembered also that when we trace the oak back to the acorn, the apple to the seed, or the chick to the egg we neither explain the riddle of the universe, nor the apple, oak, or the chick. The wood and bark of the oak, its size and shape, leaves and branches

¹ John E. Boodin: *Mind as Instinct*, *Psych. Rev.*, 1906, Vol. XIII, No. 2, pp. 121-139.

are certainly not to be seen even in microscopical form in the acorn; nor can the redness, sweetness, juiciness, or the shape of the apple be detected in the seed, or the crown, feathers, spurs, and intelligence of the cock be found in the egg. Feathers, spurs, and beak may indeed be traced to the epiblastial layer of cells, but a knowledge and description of the one is certainly not a knowledge and description of the other. Evolution is not synonymous with enlargement, with multiplication by a certain number of diameters, as we might be led to infer from the writings of not a few scientists; it means a highly complex unfolding process, not yet understood and perhaps never to be understood, but due to the interaction of the external forces of the environment and the latent internal forces of the organism. To think of evolution as an automatic unfolding of inner forces is to ignore, or be ignorant of half the story. The oak is as much a product of the soil, sun, temperature, moisture, etc., as it is of the acorn. And so with the emotions or any state of consciousness. They are not instincts and reflexes grown large or self-evolved, but the mysterious products of the interplay of a great variety of external forces and the forces of a highly complex organism. That the organism receives new powers from these external forces, powers which were not innate, and that new born functions result from this interaction is by no means improbable. Indeed, according to our conception of evolution it is the only true explanation of continuous development. So that, while not depreciating the value and importance of genetic studies we are careful not to overestimate them and see in them the final solution of all problems. We believe that there are many vestiges in the soul of early racial experiences, that there are deep-seated and instinctive emotions; but we also believe that there are many emotions which are new births, so to speak, products of new conditions; which cannot be found in the lower forms of life nor traced back to definite animal or primitive instincts. Such for example are the intellectual, moral, religious, and æsthetic emotions. Again, there are ontogenetic emotions which are due to the same causes to-day as they were in the days of our ancient progenitors, that is, emotions which can be explained by the nature of the individual's organism and personal experiences. Such are the sensational emotions which we shall now consider.

FEAR OF WATER.

F., 19. "To be washed always made me stiffen out, my eyes bulge, and I was almost convulsed with fear."

F., 17. Had intense fear of water till eleven; when bathed would scream with fear, and was almost convulsed.

Pascal, at the age of one year, had fits of great passion whenever he saw water.

F., 16. Says, "How I dreaded water; I would dip the tips of my fingers, touch each cheek, and then considered my morning ablution done; it was partly dread of cold, but partly of wet."

M. A boy of two would always cry and scream whenever he heard water poured in a dish or the noise of a stream.

F., 20. Had an overpowering and sudden fear with a sense of choking on first attempting to go into salt water.

F., 19. Had a horror of touching water till once forcibly plunged in, when it began to develop a great charm for her.

M. A boy never dreaded it till a man took him in bathing, aged five; since then it has a nervous terror for him.

M., 16. Was ducked all over under when eight; has never dared to go in swimming since, and hates the sight of water.

That this fear is in every case due to the disagreeable and painful sensations of cold and wet to which the skin of children is very sensitive, or to association with accidents or with water monsters cannot be dogmatically asserted. President Hall believes it has an instinctive basis, and suggests that first of all there is the old love for water,

traces of which still survive and crop out in some features of its charm and drawing power, when it seems so cool, safe, restful, buoyant, embracing and transparent. Returns to another syllabus will show what an unaccountable passion it is for children to see, feel, paddle in, play with or sail on water. The force and depth of this passion, after eliminating all influences in this direction due to the experience of the individual child, and others of recent philogenic origin, strongly suggest the earlier and far longer life in the sea. Later, after land developed continental dimensions, and amphibian habits gave way to conditions that established life permanently on land, the higher animals swam less and less, and at length water became dangerous in proportion to this loss of power. Those best adapted to land were at greatest disadvantage in water, and thus a fear of it became chronic and very strong because it must control the old love. Those that feared water most had an advantage in survival at a certain stage over those less timid. How severe this discipline of weaning from the old home of all life, some childish fears like those above still show. The thought of return to the old element is sometimes suddenly reinforced to the intensity of an imperative and uncontrollable impulse by the recrudescence of the archaic element, like an eruption forcing through in dyke or fissure where the superposed strata are thin or not conformable. Female suicides prefer drowning as a mode of death more often than men, because the female organization is more conservative of archaic influences than the male; the old love is stronger relatively to the old fear in them. But, thirdly, in all normal souls the two are adjusted harmoniously, so that all the pleasure of the one and all the safety of the other are combined, the fear and danger now adding a new charm.¹

¹ *Op. cit.*, p. 170.

FEAR OF WIND.

F., 2. Is always strangely excited when the wind blows; wants to cuddle away and be quiet somewhere.

M., 16. During all my childhood nothing frightened me like wind; to subdue me they only needed to say the word.

F., 17. Always dreaded wind, but trembles less than formerly. "Never fail to awake at night if it increases; I cannot lie still; wring my hands; run to another room and pace the floor until the wind has ceased."

F., 43. "As a girl I was always unhappy in exact proportion to the strength of the wind and used to watch the movements of the boughs of the trees to estimate its intensity; a sudden or even gradual crescendo in the noise of the leaves still starts up my heart; I feared every light breeze would increase into a gale; every morning on waking my first thought is of the wind, and I often compare its intensity hour by hour; I have never experienced any really dangerous wind."

F., 24. Has great horror of wind, and studies the clouds incessantly to infer their direction and intensity.

Of the twenty-two cases cited by our author under this head, the above are the only ones that can properly be called fears of wind. The others are rather cases of sadness and uneasiness produced by the sighing, moaning, roaring, rattling sounds of winds which suggest all sorts of dangers—"animals, monsters, battles, the sea in all its moods, pathetic scenes, universal dissolution," etc. The instinctive element in these cases is, we believe, negligible, if not nil.

FEAR OF FIRE.

F., 41. "My chief dread is fire, due largely to experience; I so dread it that I cannot bear the thought of being cremated, although I know that it is the best way, because I know my body would feel the fire though insensible to everything else; when I read of people badly burned I imagine the pain and wonder how they can bear it."

F., 18. With no fire experiences, for years had spells of lying awake and dreading it.

F., 18. Must always make a tour of the house to see if there is fire if she awakes at night.

F., 19. "The fear of fire preys upon my mind waking and in dreams; I always imagine I smell it, and am always expecting to see flames when I explore the house; black smoke from any chimney or any crackling sound makes me tremble."

F., 17. Just to hear the word fire sends chills all over her, her heart seems suddenly to stop.

FEAR OF THUNDER AND LIGHTNING.

From 3 to 5 F., would kneel by her mother's lap in agony and cry; and wish she were dead.

In a schoolroom one day every clap of thunder caused many pupils to break out with fresh cries, but as it grew bright and the shower passed, the bolder laughed and giped at the cries of the others to rouse their spirits.

"A lady I know, of about 35, has been bedridden for eight years with a rare form of nervous prostration. She mends steadily during cold weather, but sinks away during the season of thunder showers just in

proportion as these are severe. Every peal makes her rigid and crampy like a frog with strychnine. Every fall her state measures the total amount of thunder during the season."

M., 6. Deaf and dumb, has great horror of thunder and lightning.

F., 17. Sweats and cannot move.

F., 24. Feels with every flash, although with eyes closed, as if she had been pounded on the head.

F., 16. Says to herself after each peal; "I am not dead yet; it is nice to know that thunder comes after the lightning, although this is cold comfort, because the next clap is just as dreadful."

F., 26. Always knows by her nervous tension long beforehand if a shower is coming; is in a state of abject terror during it, cannot keep still, collects and hides all knives and steel things, loses power of speech and motion if there is a loud clap, thinks of her sins, always had a headache afterward, and wishes there was no summer so there would be no thunder.

Two cases state that they had absolutely no fear of thunder or lightning.

On the approach of a thunder shower, some shut all the windows, blinds, curtains and perhaps light the gas, go down cellar, into a dark closet, cover up the head in bed, sit on pillows in the middle of the floor, creep between feather beds on steads with legs insulated by bits of glass, etc. Some children develop elaborate protection in their fancy, as being in a globe of solid steel, a house of rubber or glass, a cellar cave, or having a fantastic system of lightning rods, some of which are amusing. It is pathetic to read of some family groups where the children have inherited this fear from the parents sitting in silent dread, praying or singing hymns, thinking, repeating or reading aloud some of the Biblical descriptions of Sinaitic thunder, or making puny spectral resolves for radical self-reconstruction, which fade in clear sky like ghost fears at dawn.¹

In the case of these and other fears we need look no further for the causes than unwholesome home influences, faulty education and feeble constitutions. Of the two cases who reported no fear of thunder one writes that she never remembers having a fear of anything living or dead; "this she ascribes to perfect health, and to the fact that she was never left with servants. Her parents made thunder showers an object lesson to teach electricity and æsthetics, so that she longed for them, and was surprised that others dreaded them." Several others were cured of their fear by proper pedagogical means.

[FEAR OF ANIMALS.

F., 6. Frightened at a tame bear; did a series of absurd automatic acts, and till 21 imagined bears in every dark, lonely place.

F., 26. Can never walk in any fields for fear of cows or bulls, and used to dream of supernatural ones.

M., 11. Had for years fear of being carried off by an eagle.

F., 17. Has always had, with no ascertainable cause, such fear of

¹ *Op. cit.*, p. 203.

horses that she cannot go near them or ride; her thoughts and dreams dwell on runaways, being run over, kicks, bites, etc.

M., 7. Has a monstrous idea of sheep, and especially bucks, and dreads them accordingly, thinking they could butt down a stone wall.

F., 17. All nightmares are dog dreams, as are all her fears by day.

F., 19. Never hears a dog bark without a shudder of fear, even if away off. Nearly all children pass through a period of fear of dogs.

F., 39. Has always had an almost morbid antipathy for cats; cannot explain it, but fears nothing so much; "they are also disgusting and loathsome."

F., 27. Always knows if a cat is in the room, though she does not see it; her terror is beyond control and brings nausea.

F., 21. The sight of a mouse always gives her hysteria, sometimes for hours, and was the cause of her worst illness; even a toy or candy mouse terrifies.

F. A live mouse makes a cook weak and sick for the day, and a dead one "queers" her badly.

F., 18. When four was given a toy rat; had never seen one before, but screamed, and has never overcome the fear.

M., 54. A strong man; fears a cat or a mouse worse than death, and will walk far out of his course to avoid a rat; his father was the same, and his brother.

F., 23. Dreads to walk off a path in grass for fear of snakes; she peers around, walks very slowly, scanning each spot, and often jumping at a crooked stick or brown grass.

F., 19. In childhood she and her sister had such terror of snakes they could not touch a book that had pictures of them in it.

F., 15. Shudders at every rustling sound in the woods made by the wind in trees, thinking it a rattlesnake.

M. "My boy's first experience with a snake, age 4, was having a small one coil about his foot; he was not hurt, but screamed with horror, and could never for a year after be left alone."

F. Adult, has horrid symptoms at everything that creeps or crawls, no matter how small.

F., 20. Could never in any way get a caterpillar off her dress; she knows they are harmless, but she is petrified.

F., 24. Has cold shudders at everything in the shape of a worm or grub, and almost faints to see people touch earth worms, caterpillars, etc.

F., 17. Is dizzy, cramped, and nauseated at green worms.

F. A college professor of botany cannot overcome her horror of worms; when botanizing, even a small one makes her grow rigid and scream.

F., 19. As a girl she had peculiar horror of earth worms; would run till she dropped if any one tried to put one on her; screamed and thought she would die if they touched her; now this has faded into a peculiar dislike.

F., 27. Fears nothing so much as earth worms; it is instinctive and she knows no cause; it often crops up at night, when she must press the clothes up around her neck lest they get down her back.

M., 15. Dreads spiders most; feels creepy to touch their webs; fears they may drop on him at night, etc.

Scores of girls and women, and not a few boys, describe special and greatly exaggerated horrors of bugs, mosquitoes, bees, wasps, ants, vermin, roaches, and many other things that crawl or buzz. Two fears specialize on moths, one on bloodsuckers, two on newts, one could not bear to see fish.

Four children have special fears of small birds, while crow, hawk, hen, goose, turkey, and especially owl, are often dreaded.

The terror of very young children at the first sight of even small animals is often intense; in three cases this occurred with toads; in two with very young chickens; in one with a caged mouse; one with a goat; one with a turtle.

This group of fears is by far the largest of all, numbering 1,486 cases and including "every familiar domestic animal, 44 intense fears of wild animals never seen, fears of 12 purely imaginary animals and most of the common small animals, bugs, insects, worms, etc." Fears of snakes and reptiles lead the list, and many of the totemisms, fetichisms, and superstitions of primitive peoples find their analogues in children of to-day. The greater fear of the small animals and insects than of the larger and more dangerous ones is due, perhaps, as President Hall suggests, to the fact that

Our nerves have been more affected by common stings and bites of vermin and things that crawl and hum than by possible death from beasts of prey. The great sensory disturbance of minimal tickle-touches is probably also a factor.¹

Their slow or rapid movements which are so unlike our own, their diminutive size and uncanny appearance, and the fact that they are generally in actual contact with us before they are noticed and can be avoided are additional factors which make the fear of them so incommensurate with the injury they can inflict.

It is interesting to note in this connection that when the higher levels of consciousness are diseased, as in delirium tremens, acute hallucinatory paranoia, etc., the fear of certain animals becomes most intense, as if the disease had set the subject back a grade or two in the evolutionary school and put him on a level with some of the timid animals.

FEAR OF EYES.

Forty-seven cases report fear of eyes.

Nine girls fear big eyes. The words "big eyes," were, for years 4 to 7, sufficient to make an otherwise brave boy run to his mother, or scream in the dark. One or more children each dread eyes that are unusually mobile, or that look at them very askance, or show much white. More specify horror at rolled-up or corpse-like eyes. Small eyes frighten some.

¹ *Op. cit.*, p. 209.

F., 6. Was long terrified at a silver pepper-pot in the shape of an owl, with its fiery-red eyes fixed on vacancy.

F., 9. Feared the bureau where an uncle kept his glass eye.

F., 5. Saw some eyes in the garden that shone and seemed fiery, and up to 16 the words "shiny eyes" would quell her and make her shake.

F., 17. While hearing a ghost story, saw her father in the next room making big eyes at her through the glass door; she turned white, became motionless, and long after was nervous and jerky at every little noise.

F., 17. Knows a person whose eyes always give her a very creepy feeling, and whom she especially dreaded to meet after dark.

F., 10. Has an almost uncontrollable fear of a colored woman who rolls her chalky eyes.

F., 7. Suffered by spells day and night for fear of the eyes of a Bible picture of a bad angel.

F., 14. Is always a little afraid of people with prominent eyes.

M., 6. Saw the eyes of his cat shine in the cellar and showed great fear.

It is seen from the above cases that there is no fear of eyes as such, but only eyes of strange or peculiar color, shape, size, movements, etc., *i. e.*, of abnormal eyes; and that it is so is but natural when we remember what an important and expressive organ the eye is, and what significance it has to the child and the lower animals as an index of its owner's intentions, feelings and thoughts.

"Instinct first looks to the eye for signs of evil or good intent, and the latter have to be slowly learned, for the slightest novelty here was often the most pressing of danger signals."¹ Consequently, when there is any deviation from the normal, elements of uncertainty and strangeness as well as ugliness enter in and excite fear. To see in these fears "ancestral reverberations from the long ages during which man struggled for existence with animals with big or strange eyes and teeth, and from the long war of all against all within his own species,"² is, we fear, stretching the recapitulation theory to the breaking point. That causes are not to be unnecessarily multiplied is or should be a rule of science.

FEAR OF TEETH.

The above observations hold true of the fear of teeth. The teeth being partially hidden may be overlooked the first few weeks of life, and then, when suddenly noticed or when they appear larger than usual, as in laughing or smiling, they may excite fear because of their strangeness or largeness.

Perhaps there are some faint traces in the soul of the experiences with animals who threatened and frightened by

¹ *Op. cit.*, p. 212.

² *Op. cit.*, p. 212.

- F., 40. The pet horror is of big wheels in motion, belts, gearing, etc.
 F., 38. Ever since she can remember has shivered at points and edges.
 M., 30. Otherwise normal can never bear to have knives and forks at table point at him; it is the same with pins and pens.
 M., 18. Always shudders at sight of large knife or very sharp small one, and does not know how he can ever shave himself or be shaved.
 F., 8. Is one of five girls, all of whom and the mother faint at the sight of blood.
 F., 25. Is sick at the sight of raw meat; cannot see it touched.
 M., 5. Almost has spasms at the sight of a mask, or if any one makes faces; a mask he once saw has haunted him for two years.

IDEATIONAL FEARS.

To this category belong those fears which are due chiefly to imagination, suggestion, association, reasoning, or belief. They may be conveniently grouped under the heads,—intellectual, moral, and religious fears. With the exception of the fear of disease, and in some cases the fear of death, these fears relate to the social and spiritual egos, as in the previous cases they related chiefly to the physical ego. They are distinctively human fears, and belong to a higher level of mentality than the instinctive and sensational fears. As the mental horizon broadens new reasons appear why the animal should be afraid; the environment becomes more complex and new conditions and causes are born which are provocative of fear.

Seeing the blindness and misery of man, wrote Pascal, contemplating the silent universe, and man without a light to guide him, left entirely to himself and like one lost in a corner of the universe, without knowing why he was put there, what he is to do, what he will become after death, and incapable of complete knowledge of anything, I became terrified as would one who should be carried while asleep to a deserted and frightful island, and should awake not knowing where he is and without means of escape.¹

Indeed, it might be possible to determine an animal's stage of development by the quantity, quality, and variety of its fears. Thus the snail fears more than the amoeba, the chick fears more than the snail, the ape more than the chick, and primitive man the most of all; but with civilized man the fear curve begins to drop rapidly, or rather physical, animal fear gives place to the higher spiritual and human fears, to feelings of awe, sublimity, reverence, and love when reason has supplanted superstition, and when the laws and forces of nature have been learned and utilized to man's advantage. Science and philosophy have already rid us of very many of the coarser fears, but by no means of all; and the young and weak, the

¹ Blaise Pascal: *Pensées*.

maimed and diseased will continue to fear even after that dreamed-of perfect knowledge which casteth out all fear shall have been acquired by healthy-minded and able-bodied adults. The 'overman' despises fear, but it is safe to say that few 'overmen' have yet appeared who have been entirely free from the base and slavish emotion which they honestly despise and strive to eradicate. Not to fear is to be either insane or divine, for the odds are too overwhelmingly against the puny, imperfect microcosm, Man, in his game with the infinite, all-powerful, still mysterious and incomprehensible macrocosm for him not to be fearful. There seems to be a law of conservation of fear according to which coarser fears may be sublimated or transmuted into finer ones, but the fear energy is never lost. Not even love can diminish the sum total of fear, for in casting out some fears it instills others which are perhaps even more painful, because more refined. These are figurative terms, but the meaning is not obscure.

The psychology of these fears is different from that of the preceding types. Instinctive and sensational fears are of a physiological, unconscious, or at least unreasoned nature,—somatic reactions of a sudden, spasmodic, or reflexive sort to given stimuli; while ideational fears are conscious, reasoned, more protracted and chronic, and require no external physical stimulus to provoke them. They lie above the threshold of consciousness, as it were, and form integral parts of the surface of the stream. In other words, there is the same difference between ideational, and instinctive or sensational fears as between reasoned, and instinctive or reflexive conduct.

INTELLECTUAL FEARS.

FEAR OF DISEASES.

F., 18. Can discover symptoms of every disease she hears of, and have symptomatic pains anywhere; the word symptom has a dreadful sound for her, and cancer makes her shiver.

F., 18. If she has a pimple or scratch, she thinks it a cancer, feels sick, and sometimes kneels and prays.

F., 8. Heard tomatoes caused cancer, and although very fond of them ate none for about two years; later, fearing consumption, and hearing that fatty things cured it, ate fat meat, well oiled lettuce and other loathed things till she was sick.

F., 10. Would eat no butter for fear of pimples.

M., 15. For years feared his heart would stop beating; was always counting his pulse, fearing it was getting low; starting up at night thinking the end was at hand; avoiding violent exercises, etc.

F., 14. Would hold a handkerchief to her nose, run past a house where any one was sick; never touch a letter containing news of a death, study the direction of the wind, etc., fearing to catch disease.

F., 11. Saw a case of St. Vitus' dance, and was terrified almost into having it.

M., 28. An accomplished graduate student of philosophy and a father writes in substance: "The one greatest fear of all my boyhood was connected with my sexual organs; the big boys would expose us little ones, and said mine was too small; I began to brood over this, age 8; felt disgraced, and haunted with forebodings; one day there seemed a very slight inflammation, age 12; I thought I had done a nameless sin, and prayed God to let me get well, which I soon did, but a morbid association between it and a hen's neck long persisted; I read literature on lost manhood, self-abuse, etc.; fancied I had all the diseases, and had committed the unpardonable sin; the first spontaneous emission nearly paralyzed me, but although I found myself still alive, felt that my days were numbered; I corresponded with a quack, and later began to study my urine with great alarm, and found plenty of marks of disease; there were reddish and whitish settlings, lack of color and over color, strong smell and no smell, it was too clear, too thick, too copious, too scanty, or, worst of all, had an iridescent scum; when 14 I gradually settled to the fact that I was sexually abnormal, might possibly live seven years, till 21, and then find what I had heard was a sure cure in marriage; I found encouragement from quack advertisements, which said the wretched beings sometimes held out for years; I lived on, and people said I was in robust health, but it was years before I realized that I was perfectly normal; Bible passages greatly aggravated my fears, such as one in Deut. xxiii, and others. As I look back my entire youth from 6 to 18 was made miserable from lack of knowledge that any one who knew anything of the nature of puberty might have given; this long sense of defect, dread of operations, shame and worry has left an indelible mark."

Most of these fears are similar to those cited under *hypermesias*, in the preceding chapter, and clearly indicate the influence of mind over body, especially when there is a real weakness upon which the fear can feed and become aggravated.

"To be weak," writes President Hall, "is to be fearful. Not only were disease and death never before so feared as now, but the imagination, which has created many horrors in the past that the world cannot soon forget, was never more actively creative of spectres of the mind than in this new field, where it checks the free, outdoor hardihood of children and youth, and hedges us about with precautions and things we cannot be, eat, do, attempt, till life is sometimes but a mean and craven fragment of what it might and should be. Many real cures ascribed to the mind, faith, etc., I think we must really ascribe to the natural physical regeneration that comes from breaking the insidious pareses of fear."¹

Dr. C. A. Scott, studying 129 cases of these fears among children, found that 30% feared small-pox; 28% lockjaw (9% imagine getting it, 3% were ready with wood, etc., to put between their jaws); 27% consumption; 21% hydrophobia; 16% diphtheria; 8% leprosy (3% imagine getting it); 6% pneumonia; 5% cancer; and 5% yellow fever. Small-pox, because of its disfiguring marks, is feared most by 18%; leprosy, hydro-

¹*Op. cit.*, p. 227.

phobia, and consumption are each feared most by 7%; lock-jaw by 5%; diphtheria by 4%; cancer, 3%; yellow fever, 3%.¹

FEAR OF DEATH.

F., 25. Up to 14 could never think of death without tears. It would often come over me with tremendous force what an awful thing death is; it cannot, must not be, that we must all die and give up this beautiful life, and I would cry and cry.

M., 6. Used to cry hopelessly and with absolute and wild abandon because he must die. It was far worse nights.

M., 15. Deems death so unspeakably terrible that he cannot speak or think of it with steady voice.

M., 46. A clergyman has been haunted and hampered all his life with the thought of death; his only consolation is the hope that he may live to Christ's second coming and not taste death.

F., 19. Dreads death almost hysterically, but only in revivals.

F., 45. Dreads death most in winter, and always prays to live till spring; fall is bad enough, but to be buried in snow is an intolerable thought.

M., 28. Dwells much on death, which he associates with eternity of time and space; to live on and on is a thought absolutely not to be endured; to think of infinite time (he is a student of philosophy) makes a lump rise in his throat.

F., 23. Has a chronic fear that her father is to die; although he is well, she fancies all the details and suffers over and over as much as if it were real.

F., 21. Her mother used to sing, "When this poor lingering, faltering tongue lies silent in the grave;" this gave her a vivid image of her mother in a coffin and a horror of death unfelt before.

The fear of death, which is exclusively a human fear, has directly and indirectly played an immense rôle in the development of art, religion, morality, and science. Starbuck, in his study of Conversion, found that in 14 per cent. of his cases, fear of death and of hell had played a considerable part. At all times some men have devoted their lives to searching for means to combat it and prolong life, and even to-day some of the best minds are engaged in this work. One of the chief functions of religion is to rob it of its horrors, and yet it can hardly be said that man is ordinarily preoccupied with the thought of it. For healthy men it is as difficult to think of it as it is to form a vivid conception of the pangs of hunger after a hearty meal, and children who have but the vaguest conception of it, when questioned, will more frequently reply that they would enjoy it than that they are afraid of it.² Of course it can be induced even in the youngest children by faulty religious training and by fear inspiring

¹ Old Age and Death, *Am. Jour. Psych.*, Vol. 8, No. 1, pp. 100-101.

² See Colin A. Scott: Old Age and Death, *Am. Jour. Psych.*, Vol. 8, No. 1, p. 93.

sermons such as are sometimes preached at revivals. During adolescence, "the storm and stress" period of life, when all the emotions are rapidly developing, and in senescence, the period of mental and physical dissolution, thoughts and fears of death are most frequent, but in early manhood and middle age it is seldom thought of even by those who are constantly exposed to danger, and strangely enough this is true of many sick people at the point of death. Indeed, instead of being dreaded, death is sometimes contemplated with extreme joy. Church and secular history teem with instances of martyrs, soldiers, and patriots who courted death; suicides have prepared for it as for a wedding, and the ancient Indian and Chinese widows who were burned with the bodies of their husbands, instead of hating and dreading the custom, loved and joyously observed it.¹

"When it [death] is associated with intense passion, with the anticipation of glory and fame, or when the gratification of animosities is the dominant desire, all feelings contradictory to these suffer a total eclipse, and death becomes desirable as a means to obtain what to the passing fancy seems a greater and the supreme end."²

FEAR OF THE END OF THE WORLD.

F., 11. Has caught from neighbors the fear that the world will end in 1899; plans to do everything before then, and pictures how the event will occur.

F., 18. No tongue can tell the anguish she suffered from this fear at all the little weather signs; it hurt her health.

F., 19. Long saw the end coming when the clouds or moon were red or fire bells rang; this fear was of great value, made her good and always ready to die.

F., 22. This horror was intensified because she believed it would come when no one was thinking of it, so felt everything hung on her keeping it steadily in mind, and she always tried to keep awake nights.

Many of these fears are due to Biblical passages and religious teachings.

FEAR OF GHOSTS.

F., 18. As a girl for a time knew, thought, talked of nothing but ghosts; would imagine something heavy moving on her bed, fancy eyes, noises, and re-enact all the stories she had heard in a cold sweat and with hair on end.

F., 17. Thought the house full of ghosts, that they were always moving on the stairs and in the halls, till she grew sickly; finally the servant who taught her was discharged; her father took her to a meet-

¹ See M. G. Ferrero: *La Crainte de la mort*, Rev. Scientifique, 1895, 3, pp. 361-367.

² *Ibid.*

ing of Spiritualists, and "they let him talk to his dead daughter Bertha through a tube; now he never had a daughter Bertha, and this cured me."

President Hall received only 203 good cases of such fears although it is very probable that the vast majority of children have experienced them.

FEAR OF POVERTY.

M., 32. Crabbed, dishonest, had but few friends. Had one child, a son, to whom he willed a large pile of almanacs. The son was on the point of burning them when he happened to look in an almanac and found twenty dollar bills between the leaves. By looking carefully through the pile he found a large sum.

M., 80. Lives by himself in a little old red house. Works very hard, eats but little. Goes to bed early in order to save oil and coal, although he has plenty of both. Hides his money in many odd places: stove-pipe, under the carpet, buries it in the cellar. He was not always this way; became so since the death of his wife about four years ago.

F., 60. Lived in a garret, thought to be very poor. Ate the poorest food, finally died of starvation. When her room was searched, four bank books were found and deeds of a great deal of property—the whole amounted to about half a million dollars.

F., 63, lived alone, dressed poorly, neighbors thought her poor. She aroused their sympathy until they practically supported her. She was found dead. While disposing of her effects to defray funeral expenses \$3,000 was found stuffed in an old clock.

M., 70, lives in a dirty old hut in the woods. He goes ragged, dirty, hair and beard greasy and unkempt. He goes hungry all the time. He is very wealthy. Keeps a portion of his money buried underneath one of the boards in the floor of his hut. When his wife died (she was as miserly as he), by her request he buried her himself, so as to save the expense of a funeral. [Several cases of this sort.]

M., 33. "Have always felt that it would be such a disgrace to be buried at public expense."

M., 39. I have often been haunted with the fear of poverty and dying in want. It is a most distressing and depressing state of mind.

F. When about 15 I had melancholy fears of poverty and loss of friends. An entrance in a diary on one of my birthdays at this time has afforded much merriment. I opined that at thirty I might be "alone, an orphan and a beggar."¹

M. A wealthy farmer fears poverty, borrows money and pays interest on it, and keeps it ready if his home is taken away; his daughter and granddaughter have this fear.

Maisie, in Mr. Kipling's *The Light That Failed*, says,

I used to dream that I had broken down, and had no money, and was starving in London. I thought about it all day, and it frightened me—oh, how it frightened me!

"I know that fear" (replied Dick). "It's the most terrible of all. It wakes me up in the night sometimes." And Mr. Kipling adds: "To each man is appointed his particular dread,—the terror that, if he does not fight against it, must cow him even to the loss of his manhood. Dick's experience of the sordid misery of want had entered into the deeps of him, and, lest he might find virtue too easy, that memory stood behind him, tempting to shame, when dealers came to buy his

¹ The above cases are taken from Kline and France, *The Psychology of Ownership*, *Ped. Sem.*, 1899, Vol. 6, No. 4, pp. 467-468.

wares. As the Nilghai quaked against his will at the still green water of a lake or a mill-dam, as Torpenhow flinched before any white arm that could cut or stab and loathed himself for flinching, Dick feared the poverty he had once tasted half in jest. His burden was heavier than the burdens of his companions."

Probably the most general and most urgent motive prompting the acquisition of property in its many forms, write Drs. Kline and France, is fear. . . . Carlyle declared that the hell English people fear most is poverty. We think the declaration might as well be made to include the rest of the human race, for in matters so fundamental there is slight room for differences.

Poverty is Pain. It always has been and is ever enlarging the pain field. Its areas include ignorance, bondage, human slavery, cruelty and misery in its divers forms. Fear is the dread of pain or of the possibilities of pain. The fear of poverty arises in anticipation or dread of the pain that it may cause. The fear is as deep seated as the suffering thereby has been great. There is no cause for wonder at those nameless feelings of dread that steal over one at the thought of being left defenceless in the world without a cent, of being suddenly cut off from the pleasures that delight us and of being assimilated with outcasts, charges, and irresponsibles, of spending one's last days in the poor house, of being buried at public expense and taking one's eternal rest in the potter's field. All those feelings of distrust of man for man in the business world, the always more or less strained relations between creditor and debtor, and the constant over-anxiety about the safe keeping of property, are further expressions of the property-fear-psychosis. It crops out among those people who put their money out at small interest in some safe place instead of putting it where pleasure and benefit in a large revenue could be derived. The extreme form of this fear lead some persons to hide their valuables in ridiculous and out-of-way places, *e. g.*, in the hems of a garment, in a bundle of carpet rags, underneath a stone, in hair combings, etc. Every one has seen or heard many incidents of this nature. One usually ascribes the hiding of money to misers, which is usually the case. But all misers do not hide money, nor are all money-hiders misers. Fear and distrust may cause even a liberal man to keep his money in his own peculiar way.¹

MISCELLANEOUS FEARS.

In addition to the above there are very many other intellectual fears, collections of which have not yet been made. Such are the fears of accidents,—drowning, burning, that the cars would run off the track, being killed by runaway horses, hurricanes, earthquakes, etc.; fears of famines, that earth's supply of coal and wood will be exhausted, that the sun will be exhausted and go out, fears of financial losses, of disesteem, of standing examinations, etc.

How anxious and agitated we are, writes Mosso, when we enter upon a new field of science; when, at every step, the doubt arises whether some important phenomenon may not have escaped us! How we are tormented by the fear of not being able to face the most vital questions, nor to find out those phenomena most fruitful in results and

¹ Kline and France: *loc. cit.*, pp. 467-469.

most subtle! What trepidation overcomes one before one writes down even a few lines in the book of science! ¹

This is equally true, of course, of any new undertaking, and reaches its greatest intensity, perhaps, in candidates for public office, on election days. At marriages and court trials fears of this type are frequently witnessed, although in these cases the predominant emotion is anxiety.

It were futile to attempt to enumerate all the intellectual fears. The above will suffice to indicate something of their variety, intensity, and the rôle they play in normal lives.

MORAL AND RELIGIOUS FEARS.

MORAL FEARS.

M., 14. The greatest fears are conscience fears; he believes heaven rewards and punishes our deeds on the spot.

F., 14. Used to have dreadful fears of conscience, but has now learned better.

F., 12. If she did anything wrong she was sure to meet a policeman, and so became good.

F., 12. If she has done anything wrong she fears the moon will fall on her.

F., 13. If she has been naughty she fears a brick will fall on her, or that she will cut herself, or fall from a bridge; this she did not connect with any divine being, but thought the world was made that way.

F., 18. Has a horror that never leaves her lest she should commit some awful sin; this comes out whenever she hears or reads anything particularly horrible.

F., 21. Teacher, when 14, found her conscience so troublesome that she finally resolved to kill herself, took a carving knife, slowly made a big hole in her dress, when her courage failed, and she decided that bad as she was, the world would have to bear with her a while longer.

Fears similar to that of the priest who worried himself frightfully at the thought of his responsibility when he had to counsel his penitents at confession are quite common, especially among teachers, guardians, and all conscientious people who hold positions of trust and responsibility. But the above cases do not begin to tell the story of the moral fears of mankind nor the suffering they entail. Nietzsche and his followers may exaggerate when they declare that the essence and basis of morality is fear, fear of violating established custom, but it can hardly be denied that the statement is at least a half truth. In the minds of mothers, who in no small measure determine our moral standards, the 'Thou shalt nots' far outnumber and outweigh the 'Thou shalt,' and the reason for this in many cases is not a highly developed con-

¹ Fear, p. 69.

science, a moral sensitiveness to the right, but conservatism born of fear. Few indeed can honestly say that they have never done or left things undone for no higher reason than the fear of social disapproval. Conscience, except in the case of those who act from a categorical imperative, is practically synonymous with fear of one's neighbor's opinions. There are, to be sure, good sociological and psychological reasons for these fears, but it should be remembered that they are fears and not positive virtues.

RELIGIOUS FEARS.

Many centuries ago Petronius and Lucretius declared that it was fear that first created the gods and religions; the Psalmist, in a different spirit exhorted: "Let all the earth fear the Lord; let all the inhabitants of the world stand in awe of him," and his illustrious son expressed the opinion that "The fear of the Lord is the beginning of knowledge." Such expressions abound in the religious literature of all peoples, the cultured as well as the most primitive. Non-religious writers, such as Hume, Alfred Maury, Max Nordau, Paul Carus, Professors Ribot, Sergi and a host of others are equally emphatic in their assertions that fear is the most important element in religion, and while admitting, perhaps, that it was the beginning of knowledge *i. e.*, of human intelligence, they most strenuously deny that it is also its end. Indeed, they maintain that a continuance of it is indicative of arrested mental development; that the enlightened man neither fears nor prays, but seeks to understand the laws of nature and to live in harmony with them.

However this may be, it is certain that primitive and ancient peoples had, and some modern peoples still have their *kakodaimonai* whom they fear and seek to propitiate with gifts and sacrifices, as well as their *eudaimonai* whom they love and praise; only, when polytheism and dualism were in vogue these were separate beings, while to-day they are qualities of the same being, but no less real and concrete. An elderly French clergyman wrote in answer to Professor Leuba's questionnaire: . . .

In my religious exercises I always experience fear towards the Holy God, who must inexorably avenge His broken law and His majesty outraged by sin.¹

¹ Monist, XI, 1901, 563-564.

And Fontaine reports of de Saci that, "The chaste fear of God and respect for his infinite grandeur so possessed him that he was in His presence as in a continual tremor of fear."¹

In the Book in which perhaps half the people of the globe still believe more or less, there are over 500 references to fear, showing what great importance it was intended to have in the religious consciousness.

The Quakers received their name because of the fact that they used to quake and tremble during their religious exercises. Christianity now smiles and appears more cheerful in her new dress fashioned and tailored by science and the general *Aufklärung*, but less than a century ago she was sitting in sackcloth and ashes, weeping, wailing, and convulsed with fear before the gates of such a hell as only the morbid imagination of man could invent. The titles of the sermons preached during the so called Great Awakening which spread over New England in 1740, such, for example, as "Sinners in the hands of an angry God," "Wrath upon the wicked to the uttermost," "The eternity of hell torments," "The future punishment of the wicked unavoidable and intolerable," etc., are sufficiently suggestive of their contents, and we are not therefore surprised when we read that strong men and women, and, worst of all, little children, were literally frightened out of their wits.

A little child, after hearing Whitefield preach, was taken sick, and saying it would go to Mr. Whitefield's God, died in a short time. "This," says Whitefield, "encouraged me to speak to the little ones. But O, how were the old people affected when I said, 'Little children, if your parents will not come to Christ, do you come and go to heaven without them.' There seemed to be but few dry eyes, look where I would. I have not seen a greater commotion since my preaching at Boston."²

Chauncy quotes the following account of Mr. Davenport's preaching written by an eye witness:³

"At length he turned his discourse to others and with the utmost strength of his lungs addressed himself to the congregation under these and such-like expressions, viz.: 'You poor unconverted creatures in the seats, in the pews, in the galleries, I wonder you don't drop into Hell! It would not surprise me. I should not wonder at it, if I should see

¹ Leuba: Fear and Awe in Religion, *Am. Jour. Relig. Psych. and Ed.*, March, 1906.

² See Tracy: The Great Awakening, p. 95.

³ See his Seasonable Thoughts upon the State of Religion in New England.

you drop down this minute into Hell. You Pharisees, hypocrites; now, now, now you are going right into the bottom of Hell! I wonder you don't drop into Hell by scores and hundreds, etc.' And in this manner he ended the sermon! After a short prayer he called for all the distressed persons (which were near twenty) into the foremost seats. Then he came out of the pulpit and stripped off his upper garments and got up into the seats and leaped up and down sometimes and clapped his hands together and cried out in these words: "The war goes on, the fight goes on, the Devil goes down, the Devil goes down; and then betook himself to stamping and screaming most dreadfully. And what is it more than might be expected to see people so affrighted as to fall into shrieks and fits under such methods as these?"

The *Boston Post-Boy*¹ described the methods employed at these revivals, as follows:

Their main design in preaching seems not so much to inform men's judgments, as to terrify and affright their imaginations: by awful words and frightful representations to set the congregation into hideous shrieks and outcries. And to this end, and in every place where they come, they represent that God is doing extraordinary things in other places, and that they are some of the last hardened wretches that stand out; that this is the last call that ever they are likely to hear; that they are now hanging over the pit of destruction, and just ready this moment to fall into it; that hell fire now flashes into their faces, and that the devil now stands ready to seize upon them and carry them to hell; and that they will oftentimes repeat the awful words 'Damned! Damned! Damned!' three or four times over.

The morbid effects produced by such sermons are best described in the words of Rev. Jonathan Parsons.

Under this sermon (preached by him), many had their countenances changed; their thoughts seemed to trouble them, so that the joints of their loins were loosed, and their knees smote one against another. Great numbers cried out aloud in the anguish of their souls. Several stout men fell as though a cannon had been discharged, and a ball had made its way through their hearts. Some young women were thrown into hysteric fits. The sight and noise of lamentations seemed a little resemblance of what we may imagine will be when the great Judge pronounces the tremendous sentence of 'go, ye cursed, into everlasting fire.' There were so many in distress, that I could not get a particular knowledge of the special reasons at that time, only as I heard them crying 'Woe is me! What must I do?' and such sort of short sentences with bitter accents.²

During the revival which swept over Kentucky, Tennessee, and adjoining States in 1800, even more painful scenes were witnessed. The floors of churches were covered with the "spiritually wounded and slain." Their cries for mercy were terrible to hear, and soon they became afflicted with various nervous disorders, such as barking, jerking, jumping, rolling, laughing, seeing visions, hearing voices, etc.³

¹ No. 301.

² Quoted by S. P. Hayes, *Am. Jour. Psych.*, Vol. 13, No. 4, p. 138.

³ See McMaster: *Hist. of the People of U. S.*, Vol. 2, pp. 578-582.

Such revivals, though perhaps of milder form, are still held among the illiterate negroes of the South and the West Indies, and the ignorant whites in the less settled portions of this country, but happily they are matters of the past in civilized communities.¹

To tell the story of religious fear among ancient and primitive peoples would take us too far afield. Suffice it to say that it was the chief cause of all the plant, animal, and even human sacrifices which they offered,² and that it is a large stone in the foundations of all religions with their various rites, ceremonies, and theologies.

That this study is extensive need hardly be repeated, but it is also no less intensive than any of the studies that have thus far been made. The fear sky has been swept with a telescope, as it were, and the larger, more important fears catalogued and classified, leaving without doubt many other subtle fears which have not yet been observed. Moreover, no psychological genius has as yet invented an emotional spectroscope by means of which we might be able to minutely analyze any concrete emotion into its component elements, nor an emotometer which would show us the relative intensities of these elements. It were idle to wish to know as much about any one of the fears above enumerated as Tennyson desired to know of the little flower in the cranny wall, but it is not impossible that in the near future we shall have as complete a scientific treatment of the emotions as was attempted by Balzac in a literary and artistic way. If this monograph will in the least measure facilitate such an undertaking, the labor spent upon it will not have been in vain.

Though we have added nothing to the sum-total of human knowledge, we shall content ourselves if we have presented a fairly clear picture of one of the most universal and oldest, both phylogenetically and ontogenetically, of emotions. Preyer thought he observed it on the second day after birth; Perez noted it at the beginning of the second month, Darwin at the beginning of the fourth, and Grasset thinks that animals as low in the scale as the infusoria present it. This need not surprise us when we remember that fear is a pain-

¹ See Davenport: *Primitive Traits in Religious Revivals*.

² See my *Pathological Aspects of Religions*, pp. 59-65. Alexander of Macedonia offered up sacrifices to Fear before he went to battle, and Tullus Hostilius erected temples and consecrated priests to it.

ful emotion and that pain is the first feeling and the mother of consciousness. Pain and its anticipation—fear, have been the greatest propelling forces in the process of evolution, but an excess of them has been as deleterious as deficiency. Not by continuing to be fearful, but by conquering fears and generating courage has progress been possible. The mental development of both the lion and the lamb, for example, has been arrested in the former, because of the absence of fear stimuli, in the latter because of the stultifying and paralyzing effects of an excess of it. Only those animals which experienced the emotion moderately, *i. e.*, which possessed but were not possessed by fears were able to develop continuously. It may be as Mr. H. M. Stanley says, that,

Other things being equal, the most easily frightened have, in the midst of many destructive agents, the best chance of survival and of perpetuating their kind,¹

but their kind is not the best, nor is the best chance of survival necessarily conducive to the best development. Whatever its value, however, for the lower animals and the child, in adults living in civilization its pain is absurdly in excess of its utility, and for this reason it must be considered somewhat as a rudimentary organ which is now useless and disadvantageous, or as a servant which was once useful and helpful but has now become superannuated and a burden. Civilized man is hampered, not benefitted, by the many instinctive and sensational fears to which he is subject.

Night is now the safest time, serpents are no longer among our most fatal foes, and most of the animal fears do not fit the present conditions of civilized life; strangers are not usually dangerous, nor are big eyes and teeth; celestial fears fit the heavens of ancient superstition and not the heavens of modern science. The weather fears and the incessant talk about weather fits a condition of life in trees, caves or tents, or at least of far greater exposure, and less protection from heat, cold, storm, etc., than present houses, carriages and even dress afford.²

However, the pedagogic problem is, as President Hall well says,

not to eliminate fear but to gauge it to the power of proper reaction. Fears that paralyze some brains are a good tonic for others. In some form and degree, all need it always. . . . Without the fear apparatus in us, what a wealth of motive would be lost! . . . One of the chief spurs to knowledge and science is to overcome fear, and many of the things now best known are those that used to be most feared. To feel a given fear no longer over but beneath us, gives an exquisite joy

¹ Evolutionary Psychology of Feeling, Macmillan, N. Y., 1895, pp. 93-107.

² G. Stanley Hall: *op. cit.*, pp. 246-247.

of growth . . . a childhood too happy and careless and fearless is a calamity so great that prayer against it might stand in the old English service book beside the petition that our children be not poltroons.¹

This phase of the subject is of the very greatest importance both because of the incalculable mental and physical suffering inflicted upon children by parents and teachers who utilize fear as the easiest means to obtain obedience, and also because of the many characters crippled by equally foolish parents and teachers who so carefully guard and shield the young from experiences, which though painful are necessary for mental, moral, and physical development, as to render them weaklings unfit to live in a world which naturally teems with pains and sufferings.

'I cannot praise,' wrote Milton, 'a fugitive and cloistered virtue unexercised and unbreathed, that never sallies out and sees her adversary, but slinks out of the race, where that immortal garland is to be run for, not without dust and heat. Assuredly we bring not innocence into the world; we bring impurity much rather; that which purifies us is trial, and trial is by what is contrary. *That* virtue, therefore, which is but a youngling in the contemplation of evil, and knows not the utmost that vice promises to her followers, and rejects it, is but a blank virtue, not a pure.'

The same stricture applies with equal force to the fearlessness which is due to inexperience. True courage is developed in the young not by artificially insulating them against all pains and fears, but by teaching them to meet these bravely and wrestle with them until they are overcome. With fear as with love, hate, anger, pity, etc., it is better for one's soul and character to have had the emotion in due measure and in due season, to be acquainted with every phase of the emotional life than by artificial training to be kept ignorant of some of them merely because they are painful. The soul of the over-protected child, like its body, is puny, delicate, and deficient in those fundamental qualities which make for true manhood and womanhood, just as the hothouse plant is inferior in taste, smell and other qualities to those grown in the open fields. Both can be improved by cultivation under natural conditions, that is by methods which are in harmony with nature and which assist it, so to speak, not by methods which remove the object from nature's essentially beneficent influences.

¹ *Op. cit.*, pp. 242-243.

CHAPTER IV.

EMOTIONAL STATES ALLIED TO FEAR.

In addition to the very many gradations of fear between the states popularly described as "I was scared just the least bit" and "I was scared to death" or "I was paralyzed with fear," there are very many cognate emotions and feelings whose names are frequently used as synonyms of fear. In English we have such words as *agitation*, *alarm*, *anxiety*, *apprehension*, *awe*, *bashfulness*, *bewilderment*, *consternation*, *dismay*, *dread*, *horror*, *shock*, *startled*, *surprise*, *terror*, *timidity*, *trepidation*, and the like, each of which represents a different variation of the fundamental emotion of fear. In every one of them there are the chief characteristics of fear, namely, trembling, shuddering, changes in heart-beat, respiration, vasomotor and other disturbances, and the etymology of the words themselves shows a recognition of this fact.

There is but very little literature on these secondary emotions, a fact which shows that our science is still in its infancy stage. Each primary emotion has its variants which must be analyzed and clearly differentiated before we can have anything like a complete psychology of the emotions. In the following pages we shall digest the scant literature on shock, timidity, and anxiety, and merely define the others so as to show in what respects they differ from pure fear.

TIMIDITY.

Few, if any of the emotions play a more important rôle in the social life of man or influence his conduct and character as much as timidity. It is almost universal and of many degrees of intensity.

Timidity is a complex emotional state of confusion, trouble, embarrassment, hesitation, fear, scruple, and bashfulness, accompanied by more or less marked physical manifestations such as, cardiac palpitations, cold sweat, trembling, blushing, awkwardness, oppression, and in severer forms nausea, vomiting, colic, vesical tenesmus, intestinal evacuations, etc. In other words, timidity is a composite emotion whose

chief elements are fear and shame. But this fear and shame are almost wholly of subjective origin and therefore unlike true fear and shame. True fear manifests itself in the presence of danger, but the young man who trembles on entering a drawing room is in the presence of no real danger. Likewise, true shame is provoked by an act, occasion, or event which justifies it, such as shocked modesty, indelicacy, awkwardness, or some fault committed. The timid child, on the other hand, who blushes when it is looked at has no fault with which to reproach itself. It is ashamed without cause other than its innate timidity. Timidity cannot even be defined as fear of persons as distinguished from fear of objects, for true fear of persons can exist only when they are known to be dangerous, whereas the timid fear people who are indulgent, well disposed and kind. What we may call false fear and false shame are therefore the two elements which are combined in various proportions in the emotion of timidity. But whence this false fear and shame? They are due to psychical or physical weakness or both. The timid person is generally a neurasthenic. Physically, timidity expresses itself in awkward movements; intellectually, in various degrees of stupidity or mental confusion and inability to concentrate the mind; emotionally, in a chaos of feelings or stupor.

Timidity, writes Dugas, to whatever function it pertains, is an inhibition or disturbance of that function; it may be defined as an in-organization or imperfect organization be it of actions, thoughts, or feelings.¹

Owing to this imperfect organization the timid are unable to react normally to their social environment, to show themselves as they really are, or to enter into sympathetic rapport with others, and a knowledge and feeling of this weakness augments their timidity. "Though naturally timid," wrote Rousseau, "I have sometimes acted with confidence in my youth, but never in my advanced age: the more I have seen of the world, the less I have been able to adopt its manners."² Having once been timid, owing to an original weakness, the subject becomes according to the neural laws of habit more susceptible to it a second and third time until after a number of experiences a definite disposition or character exhibiting certain modes of conduct, habits of thought, and emotional reactions is formed and fixed.

¹L. Dugas: *La Timidite*, Paris, 1898.

²Confession, Book IV.

It is peculiar of timidity that it is exclusively a human sentiment and arises only in the presence of a human being. Left alone, or in the presence of the lower animals the timid individual may be the bravest of men, but under the gaze of another person he becomes confused, and loses his self-possession and courage. Rousseau frequently became so confused and stupid when in the presence of others that he could not understand what was being spoken, having later in his room to recall the place, time, manner, gestures, and other circumstances in order to infer what the speakers thought. He suffered a kind of mental vertigo — a suspension of thought or enfeeblement of the control which the mind exercises over its images. Benjamin Constant makes his Adolphe say,

I never find myself at ease except when alone, and such is even at present the effect of that disposition of soul, that in the least important circumstances, when I am required to make a choice, the human figure disturbs me, and my natural impulse is to fly in order to deliberate in peace.

The presence of others produces sensorial obtusity, inattention, aboulia, and amnesia. A hard and fast line cannot, of course, be drawn between normal and pathological timidity, but if we accept Féré's criterion for determining when an emotion becomes abnormal, namely, (1) when its physiological concomitants are of extraordinary intensity, (2) when the emotion is provoked without sufficient cause, and (3) when its effects prolong or extend themselves inordinately we can see that the following account of his case which a young instructor sent to Dr. Hartenberg shows unmistakably that his timidity was pathological.

My timidity began in love, but in time other causes were added. To-day I have reached the point where I fear all society. Formerly I was a good conversationalist, but now it is extremely difficult for me to speak, I have to drag out every word from my head, am afraid of being ridiculous and imagine that every one looks at me! If they are conversing on indifferent subjects I do not know what to say: I must search for each word, each phrase, and I speak them with a felt effort. If they speak of love, mistresses, or women I blush; my misery increases, and becoming furious and discouraged I return home and nothing more interests me. If I go to theatre or a concert I imagine that every one looks at me: I would like to speak but find nothing to say; the performance leaves me indifferent; my neighbor who is amused finds me cold and stupid without suspecting the suffering which tortures me. To assist at a merry party, to be invited to dinner, these are things I dare not think of. To have a young lady sit beside me or to walk with her is martyrdom. In a store, at an examination, before a physician's door, etc., the beatings of my heart become violent and I feel a strong desire to get away. In the street I desire to be home; at home, to be more

happy, but my heart continues to beat violently and I even blush on recalling certain past scenes or on foreseeing certain future scenes. In the presence of a stranger there is timidity, in the presence of a superior, timidity; in the presence of a young lady, nay even of an infant, timidity. Recently my employer's daughter gave me a rose. Her mother remarked that since it was given to me by a young lady I ought to wear it in my button-hole. The little girl (she was fourteen) smiled, and I who am twenty-five felt troubled and blushed! I know that it is stupid, idiotic. A child has given me a lesson in calmness! . . . I have suffered from timidity everywhere, and to-day, after so long a struggle, I feel myself conquered, broken down, discouraged. I am about to lead a retired existence, almost in solitude. There is no pleasure for me; I avoid the dance like a pest, I keep away from public places, I dread society and women. My timidity has made an indelible stain and has spread over very many things. My will is annihilated, I am at the mercy of my nerves and heart. This results in a pathological state which may be defined as follows: timidity in acute cases, diseased indifference in the other cases.

What's to be done? What's to become? I am worried about the future. What is the existence of a man who is afraid of everything and cannot look anyone in the face? In such fits of despair as this I throw myself on my chair and ask myself, why cling to life if it is so unhappy. And tears are in my eyes at twenty-five!¹

At the close of the second chapter it was pointed out that there are two distinct types of animals and men—the pursuers and the fugitives. The timid belong to the latter class, are therefore unsocial, and comfortable only when alone. They are hyper-sensitive, perspicacious, scrupulous, and excessively afraid of ridicule, all of which places them at a great disadvantage in the presence of their more normal, self-possessed fellow beings. Indeed, they suffer not only on account of their own faults but, through morbid sympathy, for the faults of others. Rousseau describes at some length the intense feeling of shame he experienced when an officer in the presence of himself and others told a long story which was false from beginning to end. So vividly did he imagine the officer's discomfiture had his lie been found out that he felt as if he himself had been the guilty one.

All the phenomena of timidity (anxiety, palpitations, cold sweat, trembling, etc.,) can be reproduced by imagining them strongly. That is to say, there seems to be a memory for emotions as well as for auditory and visual sensations. Many blush in solitude when they think of a disagreeable incident, a painful confusion, or of a difficult situation for their timidity to overcome. This shows us another characteristic of the timid, namely, hyper-self-consciousness which solitude and

¹Paul Hartenberg: *Les Timides et la Timidité*, Paris, Felix Alcan, 1901.

constant self-analysis because of the many felt deficiencies, begets. Self-debarred from the society of their fellow beings they turn upon and communicate with themselves as the non-timid communicate with others, that is, they become ego-centric and inward-minded and find peace and consolation in art, literature, philosophy, or religion. Among the illustrious names in each of these departments a large per centage will be found to belong to the timid type.

Closely akin to the mental confusion is the emotional confusion or stupor experienced by many timids. Amiel describes this state as follows :

I am lost in deep meditation. . . . I seem to have become a statue on the banks of the stream of time. . . . I feel myself anonymous, impersonal, the eye fixed as in death, the mind vague and universal as nothingness or the Absolute; I am in suspense, I am as if I were not. . . . This state is contemplation, not stupor. It is neither grievous, nor joyous, nor sad; it is unlike and foreign to every emotion and every finished thought.

Similar descriptions abound in the writings of religious mystics of all lands and ages. All the well defined emotions seem to melt into a non-differentiated, primordial emotional stuff. The subject merely feels; is lost in a feeling chaos.

In milder forms there is a struggle between conflicting emotions instead of complete chaos. The subject cannot give expression to the proper emotion, is worried and disconcerted as is he who is tortured with doubts. He lacks not heart, but "presence of heart" which renders him incapable of responding immediately and correctly to an emotional situation. He experiences no sharp or sudden grief, love, or hate. These emotions he knows only by reflection after a lapse of time.

"My heart," says the timid Amiel, "never dares to speak seriously. I always sport with the passing moment, and have only retrospective emotions. It is repugnant to my refractory nature to recognize the solemnity of the present hour; an ironical instinct, born of my timidity makes me always glide lightly over that which I feel under pretext of something else or another time. . . . I have always shunned that which attracted me, and turned my back where I would secretly go."

This brings us to another interesting trait of the timid, namely, their feigning and deception in order to conceal their timidity. Instead of standing mute and motionless they will sometimes talk too much and too loudly, make unnecessary gestures and try to appear at ease and self-confident.

Rousseau writes:

I know not whether it proceeds from my mortal hatred to all con-

straint; but if I am obliged to speak, I infallibly talk nonsense. What is still worse, instead of learning how to be silent when I have absolutely nothing to say, it is generally at such times that I have a violent inclination; and endeavoring to pay my debt of conversation as speedily as possible, I hastily gabble a number of words without ideas, happy when they only chance to mean nothing—thus endeavoring to conquer or hide my incapacity, I rarely fail to show it. . . . I love society as much as any man, were I not certain to exhibit myself in it not only disadvantageously, but totally different from what I really am.¹

The timid, because they cannot be true to themselves in the presence of others are seldom understood. They wish to pay a compliment and cannot, to refuse an invitation and accept, to be enthusiastic and are cold, to be affectionate and are hateful, to be authoritative and are docile, etc.

We have treated of timidity in general, but to be more accurate it should be said that timidity, like fear, is always special and concrete. While some are vastly more timid than others, few, if indeed any, are never timid under any circumstance. Men, for example, of bold, original, speculative minds are frequently physically timid and awkward. Action disconcerts and disorientates them. Carlyle is an excellent illustration of this fact. No one was ever more put out by material cares. The very thought of entering a shop made him unhappy. The idea of ordering a suit or purchasing gloves prostrated him. He could not possibly entertain the thought of departing alone with his wife after his marriage. A similar timidity appeared in Descartes, Spinoza, Kant, and other philosophers. "If I am tolerably bold in thought", said Renan, "I am timid and cunning to excess in practice," and Mme. Ackermann confessed that while she could be very brave in her philosophical speculations she was always extremely circumspect in her conduct. Thinkers, as a rule, recoil from the actual realization of their thoughts. They can stir up revolutions and advocate reforms like Rousseau, but are unable to actively participate in them. Men of action, on the other hand, are afraid to reason. They are governed by customs, traditions and prejudices and are afraid to accept anything new. Their *neophobia* prevents them from questioning the wisdom or value of the present order of things. Again, there is an intellectual timidity found among savants who are afraid to hold an opinion on matters not within the limits of their own specialty, and so the list might be extended almost indefinitely. Timidity also

¹ Confessions, Book III.

² Dugas: *La Timidite*, p. 120.

varies with age, sex, race, social rank and heredity. Children, as is well known, are more timid and bashful than adults, and in women it is stronger than in men. The timidity of women has acquired the value of a secondary sexual quality, whereas in men its value as such is negative. However, the bravest of men may experience it in the presence of the weaker sex. The doughty Miles Standish, it will be remembered, was too timid to do his own courting.

Slavs and Germans are said to be more timid than Anglo-Saxons, and the ill-born and ill-nourished, the poor, and those having natural physical or psychical defects are more timid than the well born, the rich and able bodied. Children are timid in the presence of their parents, parents sometimes timid in the presence of their children; servants and clerks are timid in the presence of their masters and employers; masters and employers in the presence of their servants; students in the presence of their professors, professors in the presence of their students. No one is altogether and at all times entirely free from it.

STAGE FRIGHT.

A form of timidity which has not yet been mentioned is stage-fright, often experienced by actors, preachers, orators, lecturers, and all who appear before a public regularly or occasionally. Generally this fright is experienced most intensely on the first occasion, but sometimes after very many experiences. It resembles intense fear in almost every respect, having the same symptoms even to ataxia, vomiting, diarrhoea, amnesia, etc. Sometimes it is experienced as much as two weeks before the subject actually appears before the audience.

According to Dr. Hartenberg, there are three degrees of stage-fright (*trac*); (1) simple emotion, which is a state of hyper-excitation, nervous tension and muscular impatience experienced on the occasion of each serious event in life; (2) stage-fright proper, which consists of the phenomena already mentioned; (3) grand stage-fright which prostrates and paralyzes.¹

All artists experience the first even under the most favorable conditions; it is inevitable. The second varies according to the individuals. Some always vomit, others do not

¹ Paul Hartenberg: *Les Timides et la Timidité*, Paris, 1901.

but have thoracic and epigastric constrictions, palpitations, cold sweat, trembling, rising of the gorge, etc. Others have dryness of the mouth and pharynx, profuse perspiration, chills, rising of voice, etc. The psychical disturbances are in general a lowering of consciousness, weakening of memory, attention, the free flow of words and gestures causing the subject to act automatically and mechanically. In a mild form stage-fright is useful, for it gives to the artist's interpretation that slight exaggeration of the natural which the theatre requires; it lends feeling and warmth to the voice, vigor and vivacity to the gestures. It is for this reason that first nights are generally the best. When the artist ceases to experience it and is at his ease he no longer enjoys to the fullest the pleasure of playing and the satisfaction of receiving applause. The intensity of stage-fright depends upon the importance and nature of the rôle. The passive, humble, inactive rôles favor it while those which require considerable action diminish it. The costumes are also important. Rich and gorgeous costumes give more assurance than poor and soiled ones. One's partner and the audience also have an influence on it. Finally, much depends on the actor's physical and psychical condition at the time. If he is well, tranquil, and satisfied, he is less affected than when nervous, fatigued, suffering, or annoyed.

Psychologically, stage-fright seems to be a blind, spontaneous, irresistible emotional reaction which is brought on by the sole fact of having to present one's self before a public, like the vertigo which is produced by looking off great heights and precipices. Indeed, artists compare it to vertigo and seasickness. It comes on suddenly, in brutal fashion, unprovoked and uncontrollable by reason. It is an organic phenomenon, or a purely unconscious emotional reflex. Dr. Hartenberg relates the case of a domestic who was required to take the part of a domestic in an amateur performance. His rôle was merely to announce a visitor. At the proper moment he was led on the stage and the name whispered to him. But in the presence of the public he completely lost his head and could not utter a syllable. The mere fact of finding himself exposed to the gaze of the public rendered him incapable of performing an act which was his habitual occupation and which he performed perfectly every evening.

Sometimes this feeling is complicated by an element of reasoned fear. The artist is desirous of maintaining his rep-

utation, of assuring himself of the success of the production, and of covering his responsibility to the author. Tyros who have nothing to lose frequently enter with the blind and ignorant temerity of a child who knows no danger. It should be added that there is no element of shame in stage-fright, for there is no blushing. One blushes before a single person, never before a thousand. This differentiates it from pure timidity.

The stage-fright experienced by presiding officers is the same as that of actors. Francisque Sarcey has given an admirable description of his experience preceding his first colloquy which deserves to be quoted in full.

My heart did not begin to beat violently until the morning of the great day. I was taken with an uneasiness which soon became very distressing. Fear pursued me as the time approached. I felt the utter impertinence of my conduct; I saw the danger that was there, open, yawning under my eyes. I could scarcely touch my breakfast, and it was impossible to eat anything in the evening. I felt an oppression in the stomach, and the bits of food accumulated in my mouth. I was in a pitiable condition. At home they begged me to send word that I was ill, that I was suddenly taken with hoarseness. I rejected these proposals indignantly. I had had for my principle in journalism that death was the only excuse for one's not writing his article, and I still have this principle, I added. I felt that a chairman was under the same obligations. When one is on the programme he must go at whatever cost, he has no right to steal away. But with what ardor did I wish that the heavens would open and let fall a cataract, or even a propitious snow such as had once before saved me from a similar misfortune. But no; night came on serenely. I wanted to walk to the theatre; the streets were crowded, and as each carriage passed me I thought with trembling that perhaps behind those closed windows was one of those before whom I should soon fall. *Ave Cæsar, morituri te salutant.*

The evening was divided into two sessions. I was second on the programme. I had then a good hour to wait in the retiring room where Eugene Young had brought me. I was so pale, so dismayed that he thought all encouragement would be useless. After some words regarding the good disposition which the public showed he left me alone to my thoughts. They were very sad indeed. I imagine that a condemned criminal when he is being led to the guillotine has no other feelings than those that agitated me. Every now and then I felt a heaviness as if I were tumbling in space, and immediately afterwards a rush of blood and an uneasiness which did not let me sit still. I pulled out my watch every minute: for the love of God! let us end it quickly. It was an unbearable torture. . . . At the moment when the curtain which separated me from the audience was raised, my mouth became instantly dry and I could not by continued swallowing find a drop of saliva. The tongue became thick and heavy, requiring the most painful effort to move it. My voice mounted in the head. I heard it loud and piercing as if it had been another's voice. I was stupefied and disconcerted with its timbre which was strange to me; it seemed that the words, articulated with difficulty, divided themselves without my will, and I sought in vain to catch the phrases which were escaping me. It was an extremely unhappy state. . . . I continued to speak for there was no means of stopping, nor

of flight, but I heard the words dividing themselves and fall from my lips without my having any part in it, and it seemed to me that there was no sense in them. I perspired all over from shame and pity.

That evening I came home desperate and furious. I retired but could not fall asleep. I have never better understood than on these occasions the force of the popular saying: his blood has only taken a turn (*son sang ne fait qu'un tour*). I felt mine whirling in my whole body with a sort of dull rumbling, and beating impetuously against my arteries. The fever kept me awake until day, and all the developments of the meeting presented themselves to my mind which now worked with a marvellous lucidity. Appropriate and graphic words came to me in abundance; that is what I should have said! Where was my head? And this always happened on those nights when there were distinguished auditors in the hall who had been attracted by the report of my growing reputation. What will they think of me? I had the foolish desire to cry out to them: 'This does not count! Come back next Thursday.'

I arose after these sleepless nights extremely fatigued, the eyes heavy, and my whole body bruised as if I had been beaten with a cudgel.¹

Mosso, it will be remembered, described his experience in almost identical terms, and similar descriptions could be obtained from many other timid people who have had to address audiences or preside at meetings. Rousseau briefly mentions three such experiences.

Three years ago, having been to see my old friend, M. Rougin, at Yverdon, I received a deputation to thank me for some books I had presented to the library of that city. The Swiss are great speakers; these gentlemen, accordingly, made me a long harangue which I thought myself obliged in honor to answer, but so embarrassed myself in the attempt that my head became confused, I stopped short, and was laughed at.²

When his friends offered to present him to the king he vividly imagined the state of confusion he would be in and therefore declined the honor.

In this situation, justness of expression and presence of mind were peculiarly necessary in answering. Would my timidity, which disconcerts me in the presence of any stranger whatever, have been shaken off in the presence of the King of France; or would it have suffered me instantly to make choice of proper expressions? I wished, without laying aside the austere manner I had adopted, to show myself sensible of the honor done me by so great a monarch, and in a merited eulogium to convey some great and useful truth. I could not prepare a suitable answer without exactly knowing what his majesty was to say to me; and had this been the case, I was certain that, in his presence, I should not recollect a word of what I had previously meditated. 'What,' said I, 'will become of me in this moment, and before the whole court, if, in my confusion, any of my stupid expressions should escape me?' This danger alarmed and terrified me. I trembled to such a degree that at all events I was determined not to expose myself to it.³

¹ Francisque Sarcey: *Souvenirs d'âge mur*, p. 37. Paris, 1892. Quoted by Hartenberg, *op. cit.*, pp. 173-177.

² Confessions, Bk. 4.

³ Confessions, Bk. 8.

On the occasion of his Conversion to Protestantism it was necessary that he should make public profession of faith, but when the time came he was unable to say a word.

All I desired was not to appear at the consistory. However, the ecclesiastical edict was expressly to that effect; but it was agreed upon to dispense with it in my favor, and a commission of five or six members was named to receive my profession of faith. Unfortunately the minister Perdriau, a mild and an amiable man, took it into his head to tell me the members were rejoiced at the thoughts of hearing me speak in the little assembly. This expectation alarmed me to such a degree that, having night and day during three weeks studied a little discourse I had prepared, I was so confused when I ought to have pronounced it that I could not utter a single word, and during the conference I had the appearance of the most stupid schoolboy. The persons deputed spoke for me, and I answered yes and no, like a blockhead.¹

These accounts have been cited at length because they furnish clearer, fuller, and livelier pictures of timidity and stage-fright than could be obtained from a dry psychological analysis and enumeration of all the phenomena, psychical and physical.

There remains to be treated under this heading the fear of blushing, *éureuthophobia*, and the fear of being looked at, *la phobie du regard*, which are very frequent and which have been carefully studied by Bechterew,² Pitres and Régis³ and others. The fear of blushing generally begins to manifest itself at puberty, when self-consciousness, individuality, the social and sexual instincts begin to develop, and may be provoked by almost any incident. Meeting a girl, walking in public, entering a drawing-room, a store, a restaurant, any public place, to cross a busy street, to be in the presence of young women, certain topics of conversation, others' misdeeds, awkwardness, any infraction of the rules of etiquette, to be complimented, etc.,—any of these may bring the blush to the pubescent's cheek. Once he has blushed he begins to pay more attention to it than ever before, upbraids himself for it and resolves never to be so absurd again. But the seed has been planted and each new occasion contributes to the progress of the disease. Soon a lively apprehension of blushing is developed, and an excessive fear of the circumstances which can provoke it, which fears themselves provoke

¹ Confessions, Bk. 8.

² Die Erröthungsangst als eine besondere Form von krankhafter Störung, *Neurologische Centralblatt*, 1897, p. 368.

³ L'Obsession de la rougeur, *Congrès des alienistes et neurologistes*, Nancy, 1897.

blushing and thus, forming a vicious circle, aggravate the disorder.

This phobia is frequently intermittent; the subject returns to his normal state and ceases to think of it until another incident causes him to blush. But sometimes the fear is permanent and chronic. The subject thinks of it constantly and cannot forget it. It has become a fixed idea, an obsession with him. Being the most apparent symptom of timidity and the most difficult to conceal because it is not under the control of the will, it is evident why blushing should be one of the most frequent objects of fear, but it should also be remembered that a neurasthenic system is the primary cause of all pathological phenomena.

Closely connected and often in combination with the fear of blushing is the *fear of being looked at*, which springs from timidity, sometimes complicated by the psychopathic difficulty of micturition. The subjects generally wear smoked glasses, turn their heads, keep their eyes lowered, and employ every means to avoid the look of another. They feel ill at ease and are unfortunately fully conscious of their weakness. They are afraid that others will see their weakness in their eyes, and some say they feel a magnetic influence issuing from the gaze of others and therefore avoid it. M. Bechterew cites several cases that are pathetic in the extreme.¹ They are unable to engage in active work, their thoughts revolve constantly about their fixed fear, they avoid society, live in seclusion, become melancholy, pessimistic, misanthropic, and not infrequently commit suicide. In every other respect they seem perfectly normal, but there can be but little doubt that this phobia springs from psychopathic or neuropathic soil. It is especially strong in those addicted to secret vices such as onanism. They imagine that others can see in their eyes that they are addicted to this vice. One young man writes that this fear was strongest when he yielded to the habit most frequently, and disappeared entirely when he freed himself of the habit. A timid, neuropathic young lady having received an improper proposal imagined that there must be something suggestive of evil in her glances, and could not thereafter bear to look at or be looked at by men. This fear soon became so fixed that she had to seclude herself in her room for weeks at a time. She states that when

¹ W. Bechterew: La phobie du regard, Arch. de Neurol., 1905, XX, pp. 11-31.

looked at by men her countenance actually assumes an impure expression and she is then unable to think of anything else. The fixed idea that she had the appearance of a lost woman almost drove her to suicide.¹

SHOCK.

The nervous system has been shaped and developed through the ages to receive and react efficiently to the ordinary, every-day, external stimuli which fall within certain limits of intensity, quality, quantity, velocity and change. Stimuli below the lower limit fail to make any impression, while those above the normal upper limit produce extreme pain and shock or other pathological condition. Whenever the nervous system is affected in a way to which it is not accustomed, *i. e.*, too suddenly, or violently, or in an altogether new and unexpected way, whenever the even tenor of consciousness is abruptly interrupted, serious cerebral and vasomotor disturbances take place; and these we call shock. This shock may, of course, be of various degrees of intensity ranging from startled surprise to kataplexy and even death.

Groeningen defines shock as "an exhaustion of the medulla oblongata and spinal cord due to excessive irritation;"² Mr. Savory defines it as "the paralyzing influence of a sudden and violent injury to nerves over the activity of the heart;" Professor Baldwin, as "a condition of sudden disturbance mainly of an inhibitory character affecting almost all the vital and nervous functions, following upon bodily injury or intense emotion."³ The last, though very general, is perhaps the best definition, for it takes into account the mental as well as the physical element in shock, a point which has been overlooked by several writers on the subject. "A vivid emotion," to repeat one of Mosso's phrases, "may produce the same effect as a blow on the head or some physical shock." In railway and other accidents, in surgical operations, in battle, etc., those who escape without bodily injury often suffer very severely from mental shock, sometimes most severely, days and weeks after the occurrence of the accident.⁴

In the preceding chapters, examples were cited of death

¹ Bechterew: *op. cit.*

² Ueber den Schock, Wiesbaden, 1885.

³ Dict. of Philos. and Psych.

⁴ See Hack-Tuke: Dict. of Psych.-Med.

produced by shock due to some violent emotion. Another interesting case is recorded by Dr. Lauder Brunton.

Many years ago the janitor of King's College, Aberdeen, had rendered himself in some way obnoxious to the students, and they determined to punish him. They accordingly prepared a block and axe, which they conveyed to a lonely place, and having dressed themselves in black, some of them prepared to act as judges, and sent others of their company to bring him before them. When he saw the preparations which had been made, he at first affected to treat the whole thing as a joke, but was solemnly assured by the students that they meant it in real earnest. They proceeded to try him, found him guilty, and told him to prepare for immediate death, for they were going to behead him then and there. The trembling janitor looked all around in the vain hope of seeing some indication that nothing was really meant, but stern looks everywhere met him, and one of the students proceeded to blindfold him. The poor man was made to kneel before the block, the executioner's axe was raised, but instead of the sharp edge a wet towel was brought smartly down on the back of the culprit's neck. This was all the students meant to do, and thinking that they had now frightened the janitor sufficiently, they undid the bandage which covered his eyes. To their astonishment and horror they found that he was dead.¹

There are no statistics on the number that have suffered and died from shock sustained during initiation into lodges and secret societies, but the number is undoubtedly large, and in all these cases the origin of shock is mental not physical.

In this connection, several of the 'returns' on this topic collected by President Hall will be of interest.²

M., 6. Was once in a cyclone, when his mother gathered her children and said they would all die together; was frightened into St Vitus' dance and made weak minded.

F., 9. A girl tore her nail in a door and fainted; her older brother saw it, fell in a faint and injured his shoulder; another brother found them, and all three were found lying together in a faint, and were nervous for weeks.

M., 5. When he was playing, his grandmother gave one of those sneezes that "made the very crockery rattle in the pantry;" he was shocked into unconsciousness, and lay fainting for a long time.

F., 13. The greatest shock for her is to be intent on something, and looking up suddenly to find people near.

M. A man dying of typhoid fever was moved from a burning house in the country to another house, which also soon caught fire, when he was taken to the road, where he was burned by a hot shingle on his forehead; his wife, too, died some weeks later from the oft-rehearsed horror of it all.

F., 18. Heard of the sudden death of a friend she had chatted with that morning; "the awful shock nearly killed me, and changed me in a moment from a careless girl into a woman."

F., 16. At the age of ten her brother jumped at her, and the fright

¹ T. Lauder Brunton: On the Pathology and Treatment of Shock and Syncope. Boston Medical Library.

² A Study of Fears, *Am. Jour. Psych.*, Vol. 8, pp. 193-201.

caused stuttering which lasted for years, but was slowly overcome. (Several cases of severe shock due to being frightened in the dark.)

F., 18. Was in a hammock, toward which a dog rushed after a cat; when he was near he gave one bark, and she saw the open mouth which she thought was meant for her; "it was over in a flash, but I could not move; was given a horror of dogs, and had complete exhaustion for weeks."

F., 30. Upon sudden news of a friend's death had hemorrhage of the womb, from which she died in a few days.

F., 22. On hearing sudden news of the death of a friend, struck the messenger in the breast, lost consciousness, and for years after could not hear of like accidents without fainting and acute pains in the back; a spot on the door remains somehow indelibly associated with the scene for twenty years.

Four cases of shock or prostration are due to explosions at the theatre; three were made ill by blasting; twenty-six shocks at the onset of street bands, fire and church bells, and nine of sneezes, or stories with "boo" in them.

The effects of shock vary in different individuals and in the same individual at different times. Women are less susceptible to it than men, and confirmed invalids and those whose nervous systems have become blunted and inured to suffering less so than those whose systems are vigorous and responsive. A strong, healthy man frequently succumbs to a shock due to a surgical operation more quickly than a bed-ridden patient. Again, temperament, mental conditions, and age are important factors. The sanguine and mobile temperaments are more susceptible to it than the phlegmatic and lymphatic ones. Depressing states aggravate it, while joyous, expansive states act as prophylactics. The young recover from its effects much more readily than the old.

The reactions to shock are also different. Some faint, or remain motionless, others start up, tremble, pant, have spasms, make a wild rush, fight, or "develop slow, grave symptoms."

The effects of sudden shock are of two chief kinds. The first is a muscular start. This may be almost entirely inco-ordinated, a "mass of clotted motion," or more organized movements of defense, flight, etc. It may be of all degrees of violence, from the slight start, so common in impressionable people, to cramp or reflex epilepsy, with resulting lameness. The other group of effects is predominantly psychic. There is intense *commotio cerebri*, with its present distress and perhaps sequent obliteration of memory and motor images, parasthesia, hypalgia, etc.¹

The exact nature of the cortical changes which accompany psychical shock is not known. There are several theories concerning the subject. One theory holds that the cells, particularly the glia cells make amœboid movements of con-

¹Hall: *op. cit.*, p. 196.

traction and relaxation. When these cells contract, owing to a shock stimulus, new connections are made among their processes and old ones broken, giving rise to new associations, forgetfulness, insistent ideas, confusion, sleep, fatigue, paras-
thetia, stuttering, paresis, etc. Schiefferdecker, however, denies that there are movements among the neurons and glia cells; Groeningen suggests a neuro-pathological basis for shock, namely, that there is a breaking down of the nervous elements, a consumption of energy, and probably a disarrangement of the molecular particles. This view accords with the well known results obtained by Dr. C. F. Hodge in his study on the effects of fatigue and intoxication on the nerve cells.¹

Others hold that the immediate cause of shock is a profound physiological disturbance, namely, the dilatation of the intestinal vessels and the stoppage of the heart.

The intestinal vessels are so capacious that when they are fully dilated they can hold all the blood in the body. Normally, however, they are kept in a state of partial contraction by the influence of the vasomotor nerves which supply them.²

But when the vasomotor nerves are paralyzed by a sudden or strong stimulus both the arteries and veins dilate and hold so much blood that not a sufficient quantity is left to keep up the circulation in the rest of the body.³ This explains the many symptoms of shock such as pallor of the surface and coldness of the skin, the lowering of the pulse and respiration, cold perspiration, mental confusion, drowsiness, and insensibility due to the cutting off of blood supply to the brain, inability to sustain thought or attention; visual, auditory, and motor disturbances, sensations of creeping, crawling, tingling, burning, apprehension, oppression, numbness, deadness, etc. These symptoms may become chronic and give rise to what is known in recent medical literature as *traumatic neurasthenia* and *traumatic hysteria*, or neurasthenia and hysteria due to injury or shock.

In view of the imperfect knowledge on these points, the most that can be said is that shock is due to some violent disturbance among those centres which control the capillaries giving rise at the same time to psychical and physical phenomena of various sorts.

¹ See Dr. Warren: *Surgical Pathology and Therapeutics*, p. 285.

² Brunton: *op. cit.*

³ See G. W. Crile: *Surgical Shock*, *Medical News*, June 20, 1903.

Shock, like all other feelings and emotions, has its own evolutionary *raison d'être*.

The paleontologist Scott maintains that species are derived from one another by small shocks. Each shock caused the old limits to be transgressed; but, after it, the new species remained unchanged until, perhaps after centuries, a new shock made it transgress its new limits. It prevents stagnation, keeps all the psychical and physical powers alert, incites to great activity to alleviate environmental conditions and makes for progress in every direction.

It prompts birds and animals to post sentinels, build shelters, etc., and profoundly modifies their habits. Spencer's theory of the evolution of the eye as anticipatory touch in order to avoid sudden contact, the definition of science as prevision, the struggle to get science logically organized and thinkable, evolution, the elimination of miracles, are all in order to protect from and save the waste of shock by enabling man to anticipate change from afar, and do his thinking and feeling with the shock elements reduced to the point of greatest possible economy, yet not so faintly agglutinated as to be obscure. Even attention is an organ of anticipation, an increasing knowledge makes its hodograph approximate an ever steadier causal alignment. As man reduces and organizes the shocks with which his psychic life began, to terms of greatest legibility with given time and energy, the subtlety required to deal with these reducta as well as impressionability to the vastly wider ranges they open, increases, and intelligent adults grow less familiar with the ruder forms of shock and less tolerant of them. Children, however, are more exposed. Their world still has wide realms of chance, where the most unexpected things may happen any moment. In many cases of development arrested in juvenile stages, we still get glimpses not only of what the ancient chaos of ignorance really meant and of the awful struggle and loss by which it has been overcome, but also of the sanifying culture power of what are now the commonplaces of science.¹

Though, as has been shown, shock is quite a frequent cause of mental diseases it also sometimes acts as a curative agent. Michia used to write insulting anonymous letters to his hypochondriacal patients in order to shock them out of their fixed ideas. Hysterics have sometimes been cured by sudden fright when all other means proved unsuccessful. It is reported of Boerhave, that while physician at Haarlem he suppressed an epileptic epidemic by having a number of pin-cers and tweezers heated red hot and threatening to burn all patients who had fits. Wiedemeister reports the case of a young bride who suddenly became dumb while preparing to leave her home and remained so for several years. One day she witnessed a fire which frightened her so that she cried out fire! fire! and continued to speak from that time on.

¹ Hall: *op. cit.*, pp. 197-198.

Mild forms of shock have been recommended as effective means of curing obstinacy and as a mode of punishment. The shock relieves the high nervous tension and drains off the energy into other channels. Obstinacy is a kind of mental cramp which a mild shock such as corporal punishment can best relieve.¹ However, this means should be resorted to, if at all, only after all others have failed and when the parent or teacher is sure that no evil effects will follow.

ANXIETY.

Anxiety is defined as a condition of restlessness and mental agitation with a distressful feeling of tightness and oppression in the region of the heart. Etymologically, it means a choking distress, from the Latin *angere*, to choke, distress. It is both mental and physiological (precordial anxiety), but less physiological than anguish from which it must be distinguished.

Anguish is in regard to the known, anxiety in regard to the unknown; anguish is because of what has happened, anxiety because of what may happen. Anxiety refers to some future event, always suggesting hopeful possibility, and thus differing from apprehension, fear, dread, foreboding, terror, all of which may be quite despairing. In matters within our reach, anxiety always stirs the question whether something cannot be done, and is thus a valuable spur to doing; in this respect it is allied to care. Foreboding, dread, etc., commonly incapacitate for all helpful thought or endeavor. Worry is a more petty, restless, and manifest anxiety; anxiety may be quiet and silent, worry is communicated to all around.²

However, anxiety frequently expresses itself in motor restlessness, pacing back and forth, making many purposeless movements, and if very great, in motor explosions, blind rage, and even murder and suicide.

It differs from fear in that it contains an element of hope and has no definite object; those experiencing it frequently report that they know of no reason for it. The psychological symptoms are mental confusion, loss of memory, etc.

How much knowledge remains undiscovered at examinations, writes Herr Laehr, how many well prepared love declarations are untold, how often is the thread of discourse lost because the unhappy individual seized with anxiety not only lacks the breath necessary to speak, but has lost his memory and his thoughts have vanished.³

¹See T. L. Smith: *Obstinacy and Obedience, Ped. Sem.*, Vol. 12. I am indebted for some of the above statements to an unpublished paper on Shock by Mr. W. L. Gard, of Clark University.

²Standard Dictionary.

³H. Laehr: *Die Angst, Berliner Klinik*, 1893, No. 55.

The subject feels disturbing sensations in the region of the heart, which are sometimes painful and give rise to contraction of the thorax; there is a feeling of weakness in the arms and legs, difficulty in moving and holding himself erect; a sensation of warmth spreads over the breast and visceral organs while externally there is a sensation of cold. The heart beat is almost always accelerated, strong, irregular in time and intensity. The pulse is intense, generally small, and the skin pale, although when long continued the face becomes flushed, owing to the contraction of the veins. The breathing is irregular, the inspiration short and frequently interrupted, the expiration drawn out; there are sighings, frownings, yawnings, and sometimes speech defects due partly to the irregular action of the laryngeal muscles and partly to the acceleration of the expiration. In extreme cases there is goose flesh, cold sweat, erection of the hair, dryness of the mouth and throat and tendency to urinate and defecate frequently.

It should be observed that while these physiological disturbances may be produced by mental anxiety, when they already exist owing to other causes, for example, sea-sickness, indigestion, lung and heart troubles, etc., they produce mental anxiety, showing again the close relationship between mind and body. In the one case the disturbance goes from the brain to the vasomotor centres in the medulla; in the other, from the sympathetic system to the medulla and thence to the brain. That the vasomotor centres are the seat of anxiety is further proven by the fact that those poisons which affect them, such as strychnine and nicotine also provoke anxiety, while those which do not affect them do not produce it. Alcohol, which enervates the vessels, dispels anxiety. Anxiety is most frequently found among neurasthenics, paranoiacs, melancholiacs, those suffering from fixed ideas, delirium tremens, epileptic, hysterical, and other nervous disturbances.

Terror. Terror designates extreme and sudden fear which overwhelms and paralyzes the mind. The individual is "rooted to the spot," loses all power of motion, and becomes an inert mass. The lips and limbs tremble, the jaw drops, the eyes stare, breathing is suppressed, and the face becomes deadly pale.

Dread. Dread differs from fear in that the latter is provoked by an immediate or imminent danger, while the former

pertains to future possible dangers or troubles. "I am frightened in the night by a sudden noise; I am alarmed for the safety of a child awaking near a precipice; but I dread next week's task."¹ A condemned criminal dreads the approach of the fatal day; an unprepared student, the approach of an examination; a timid speaker, the approach of the day when he must deliver his oration, etc. It would be interesting to determine the relationship between our sense of nearness or remoteness of a fearful event and the intensity of the fear.

Horror. Horror is an altruistic fear.

When on a train I am *terrified* if I perceive a collision imminent and inevitable, but as a mere spectator walking near the tracks, I am *horrified* by the prospect of a collision. One may be in mortal terror, but not in mortal horror.²

This emotion is strongest in sensitive, sympathetic, social people.

Awe. Awe is a reverential fear, inspired by what is sublime and majestic. It is the most sublimated form of fear and the very last to be developed. It is provoked not by danger, imminent or distant, to the individual himself or to another, but is rather a feeling of reverence mingled with impersonal fear in the presence of something which overwhelms by its grandeur and magnitude and makes the individual feel puny and insignificant beside it. The Niagara Falls, the starry heaven, the mighty ocean, the Infinite, the Absolute, strike us with awe, not fear. Awe is one of the most intellectual forms of fear, and therefore unknown to the lower animals.³

Before concluding this study the writer wishes to emphasize again the need of more intensive study of each of the special fears and the cognate emotions. If he has succeeded in showing the state of general ignorance concerning the psychology of the emotions, one of his chief ends will have been attained.

¹ H. M. Stanley: *Evolutionary Psych. of Feeling*, pp. 108-120.

² H. M. Stanley: *op. cit.*

³ See H. M. Stanley: *The Differentiation of Fear in his Evolutionary Psychology of Feeling*, pp. 108-120.

BIBLIOGRAPHY.

1. ANDRES, A. La paura della morte. Riv. Ital. di Filos., x², 1895, 309 f.
2. ANONYMOUS. Unreasoning fear and its physical basis. Med. News, 1900, 302-303.
3. BECHTEREW. La phobie du regard. Arch. de Neurol., 1905, 11-31.
4. BERILLON, E. Les phobies neurasthéniques envisagées au point de vue du service militaire. Rev. de l'Hypnotisme, 1894, 241-248.
5. BEYRAND, A. Les terreurs nocturnes de l'enfant (Thèse). Paris, 1900.
6. BINET, A. La peur chez les enfants. L'Année Psychologique, 1895, 223-254.
7. BINET ET COURTIER. Influence de la vie émotionnelle sur le cœur, la respiration et la circulation capillaire. L'Année Psychol., 1896, 65-126.
8. BINET-SANGLÉ, CH. La peur et le courage militaire. Arch. d'Anthropol. Crim., 1905, 453-463; 513-545 (bibliography).
9. BOWLES, M. E. Emotions of deaf children. Ped. Sem., 1895, 330-334.
10. BRASSERT, H. Ueber die Erröthungsangst. Neurologisches Centralblatt, Oct., 1899.
11. BRIEN, B. De l'Agoraphobie. Thèse de Lyon, 1899.
12. BRUNTON, L. T. On the pathology and treatment of shock and syncope. Boston Medical Library.
13. CALKINS, MARY W. The emotional life of children. Ped. Sem., Vol. 3, 319-323. (Tabulated fears of 202 children.)
14. CHAMBERLAIN, A. F. On the words for "fear" in certain languages. Am. Jour. of Psy., Vol. 10, 302-305.
15. CHERVIN. Des phobies verbales. Soc. d'éditions scientifiques, Paris, 1895.
16. CHRISTOPHER, W. S. Three Crises in Child Life. Child Study Mo., Dec., 1907, 324-333.
17. CLOUSTON, T. L. The delirium and night terrors of children. Hack-Tuke's Dict. of Psych Med., Vol. 1, 357-371.
18. COUTTS, J. A. Night terrors. Amer. Med. Jour., 1896, 156-162.
19. CRUCHET, R. Caprices et peurs infantiles. Gaz. de Sci. Med., Bordeaux, 1895, 18 f.
20. DARWIN, CH. Expression of the emotions in man and animals. D. Appleton & Co., N. Y., 1873.
21. DE BUCK. Névrose d'angoisse. Belgique Med., 1901, 193-199.
22. DUGAS, L. La Timidité. Felix Alcan, Paris, 1898.
23. FÈRE, CH. The Pathology of Emotions. London, 1899, pp. 525.
24. FÈRE, E. Expériences relatives à la peur chez les poussins. C. R. Soc. de Biologie, 1898, 790 f.
25. FERRARI, G. C. La peur de la mort. Rev. Scientifique, 1896, 59-60.
26. FERRERO, M. G. La crainte de la mort. Rev. Scientifique, 1895, 361-367. (Translated in Pop. Science Mo., 1897, 236-240.)
27. GÉLINEAU, E. Des peurs maladives ou phobies. Soc. d'éditions scientifiques, Paris, 1894, pp. 204.

28. GÉLINEAU, E. Les Pseudo-phobies, *Rev. de l'Hypnotisme*, 1893-4, 353-359.
29. ———. Quelques réflexions sur les phobies. *Rev. de Psychiatrie*, 1896, 128-134.
30. GRASSET, J. La peur, élément psychique normal de défense. *Jour. de Psych. Norm. et Path.*, 1904, 265-268.
31. GROENINGER. Ueber den Schoek. Wiesbaden, 1885.
32. HALL, G. STANLEY. A Study of fears. *Am. Jour. Psych.*, 1899, 147-249.
33. L'HARDY, A. G. Influence de la peur dans la cas de mort par la chloroforme. *Gaz. des Hôp.*, 1904. (85.)
34. HARRISON, M. M. Children's sense of fear. *Arena*, 1896, 960-969.
35. HARTENBERG, P. Les timides et la timidité. Felix Alcan, Paris, 1901, pp. 264.
36. ———. La peur et le mécanisme des émotions. *Rev. Philos.*, 1899, 113-134.
37. ———. La névrose d'angoisse. Paris, 1902, pp. 264.
38. ———. La timidité. *Rev. de Psychol. Clinique et Thérapeutique*, 1899, 33-42.
39. ———. Les timidités des races. *Rev. de Psych. Clin. et Thérapeu.*, 1899, 257-260.
40. HIRSCHLAFF, L. Ueber die Furcht der Kinder. *Zeit. f. päd. Psychol.*, 1901, 296-315; 1902, 39-56; 141-156.
41. HUDSON, W. H. The naturalist in La Plata. London, 1895. (Chap. on fear in birds.)
42. JONES, R. A case of agorophobia with remarks upon obsessions. *Lancet*, 1898, 568-570.
43. KLINE, L. W., and FRANCE, C. J. The Psychology of Ownership. *Ped. Sem.*, 1899, No. 4. (Contains a section on fear of poverty, pp. 476-480.)
44. KOREIDER, M. K. Fear, a Case. *Jour. Orific. Surg.*, 1897, 6, 162-169.
45. KOVALEWSKY, P. J. Folie du doute. *Jour. Mental Science*, 1887, 209-218; 524-532. (Treats of phobias.)
46. LAEHR, H. Die Angst. *Berliner Klinik*, 1893, 55 heft.
47. LEUBA, J. H. Fear and Awe in Religion. *Am. Jour. Rel. Psy. and Ed.*, 1906. (1)
48. LITTLE, E. G. The causation of night terrors. *Pediatrics*, N. Y., Oct. 15, 1899.
49. LIVITER, A. P. Fears of childhood discovered by a mother. *Kindergarten Mag.*, Oct., 1899, 82-87.
50. MELINARD, C. Le sentiment de la peur. *La Revue*, 1901, 526-536.
51. MILLS, WESLEY. A study of fear. *Science*, 1897, N. S., 153. (A very brief note.)
52. MOSES, J. Pathological aspects of religions. *Am. Jour. Relig. Psy. and Ed.*, Monograph Supplement, Vol. 1, Sept., 1906 (contains sect. on religious fears), pp. 42-65.
53. MOSSO, A. Fear. Longmans, N. Y., 1896, pp. 278.
54. NEALE, J. H. Agorophobia. *Lancet*, 1898, 1322-1323.
55. OSLER, W. Unusual types of night terrors, day terrors. *Montreal Med. Jour.*, 1896, 778-780.
56. REGIS, E. Les phobies à deux. *L'Echo Medical*, Toulouse, 1896, 241-246; 253-260.
57. RICHTER, CH. La peur. *Rev. de Deux Mondes*, 1886, 73-117. *Trans. in Pop. Sci. Monthly*, 1886, 771-784.
58. ROWE, S. H. Fear in the discipline of the child. *The Outlook*, Sept. 24, 1898, 232-234.
59. DE RUPPIERRE, B. De la peur chez les vieillards (Thèse). Nancy, 1901.

60. SCOTT, COLIN A. Children's fears as material for expression and a basis of education in art. *Trans. of Ill. Soc. for Child Study*, Apr., 1898, 13-17.
61. SENET, RUDOLPHO. Quelques considerations sur la nyctophobie chez les enfants. *Arch. de Psych.*, 1905, 350-357. (509 cases.)
62. SOUKHANOFF. Manifestations individuelles des peurs obsédantes dans la constitution ideo-obsessive. *Arch. de Neurol.*, 1903, 197-202.
63. STANLEY, H. M. *Evolutionary psychology of feeling*. Macmillan, N. Y., 1895.
64. ———. A study of fear as primitive emotion. *Psych. Rev.*, 1894, 1.
65. WAGNER, W. A. Physical pain and the feeling of fear. *Voprosi Philos.*, 1900 (3), (in Russian).
66. WASCHIDE, M. ET MARCHAND L. Contribution à l'étude de la psycho-physiologie des émotions apropos d'un cas d'ereuthophobie, *Jour. de Med. de Paris*, 1900, 367-382. *Rev. de Psych.*, 1900, 103; 193.
67. WILSON, G. R. The sense of danger and the fear of death. *Monist*, 1903, 352-369.
68. ZBINDEN, H. La crainte de l'insomnie. *Arch. de Psychol.*, 1903, 181-182.

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