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IN SEARCH OF THE SOUL

AND THE MECHANISM OF THOUGHT, EMOTION, AND CONDUCT

A TREATISE IN TWO VOLUMES

CONTAINING

A BRIEF BUT COMPREHENSIVE HISTORY

OF THE PHILOSOPHICAL SPECULATIONS AND SCIENTIFIC RESEARCHES

FROM ANCIENT TIMES TO THE PRESENT DAY

AS WELL AS

AN ORIGINAL ATTEMPT

TO ACCOUNT FOR THE MIND AND CHARACTER OF MAN

AND ESTABLISH THE PRINCIPLES OF A SCIENCE OF ETHOLOGY

VOLUME II

The Origin of the MENTAL CAPACITIES and DISPOSITIONS of Man and their Normal Abnormal and Supernormal Manifestations

BY

BERNARD HOLLANDER, M.D.

Author of *The Mental Functions of the Brain*, *Mental Symptoms of Brain Disease*, *The First Signs of Insanity*, *Nervous Disorders of Men*, *Nervous Disorders of Women*, *Abnormal Children*, *Hypnotism and Suggestion*, etc.

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SECTION I

ANALYSIS OF MAN'S PSYCHICAL NATURE

CHAPTER XXV

ETHOLOGY: THE SCIENCE OF CHARACTER

HAVING concluded the history of philosophy and science in Vol. I., the reader will now be prepared for the consideration of those problems which form the real subject-matter of this work. We propose to deal with them, in succession, as follows:

(1) The mental organisation of man;

(2) The physical structure which serves for the manifestation of his intellectual capacities, emotional tendencies, and instinctive impulses; and

(3) The evidence for the existence of higher capacities in man which apparently are spiritual; that is to say, for which, up to the present, no explanation has been found.

THE SCIENCE OF CHARACTER AND CONDUCT

We have seen that, notwithstanding some twenty-five centuries of philosophic speculation and more than two centuries of scientific research, we are still in ignorance of the nature of mind, of the varieties of mental activities, and the laws which govern them. One of the reasons for this lack of progress is that most psychologists until quite recently concerned themselves almost exclusively with consciousness, and the ideas and understanding of man, studying "thought" for its own sake, whereas **the science of mind also embraces strivings and desires, feelings and action,** *i.e.*, character and conduct. The great problem of psychology throughout the ages has been: "Have we *ideas* independent of experience?" But far more important is the question, so long ignored: "Have we *desires* independent of experience?" The psychologist studied himself, by a method of introspection and self-analysis; whereas the true mental philosopher studies his fellow-men and uses his powers of observation. The psychologist looked around his own mind-chamber, whereas the practical philosopher looks out upon the theatre of human life wherein all human beings are the actors.

Each psychologist wrote long and most abstruse disquisitions upon the patent and latent errors of his eminent predecessors, besides giving the world speculations of his own; but it is a lamentable testimony to the insufficiency of the method of psychology that, notwithstanding the number of its distinguished followers, the greatest thinkers that the world ever possessed, they had to hand over to poets, dramatists, and romance-writers the description of the fundamental facts of human nature and motives of conduct, and the problems that arise from them. Success in life depends largely on knowledge of the character of one's fellow-men; but character cannot be studied by introspection. A successful business man knows

more about it than is disclosed in our psychological text-books. No matter how much we may study ourselves, the knowledge of our own individuality will be of little use unless combined with the knowledge of the individuality of others. Mental phenomena do not lend themselves to self-observation like physical phenomena ; they are in a state of continual change. When in a passion, we cannot stop and observe it ; for by reflection the emotion tends to be weakened, and may even disappear altogether. Moreover, the highly instructive study of mental disorders—the pathology of mind, to which we are about to contribute considerable material in this work—is altogether impossible by the method of self-introspection.

To know one's self is a task attended with no small difficulty ; and to suppose that we can attain self-knowledge by mere consciousness is an error as great as it is fatal. The difficulty of this study was acknowledged by the ancients ; in fact, the attainment of self-knowledge was regarded by them as worthy the attention of the gods, requiring the highest exertion of the soul. " Know thyself," was a precept of THALES, the Milesian, who said : " That for a man to know himself is the hardest thing in the world." It acquired the authority of a divine oracle, and was written in gold letters over the door of the temple of Apollo, at Delphos. Indeed, Apollo was supposed to be its author ; because, as Cicero said, " it has such a weight of sense and wisdom in it as appears too great to be attributed to any man."

A complete science of mind must include a science of character. Possibly one of the reasons why this subject has been neglected so long is that—as with religion and politics, so with human character—everyone claims to have a knowledge of it, and to be able to discourse upon it if called to do so. Yet just because everybody appears to know all that can be said about it, the subject has been treated only in a popular manner and has so far not been subjected to a scientific analysis.

Human character from all time has been popularly studied, and all men may lay claim to a certain knowledge thereof ; but hitherto we have rested content with studying the actions of human beings, without searching for the hidden springs governing them. What is it that makes one man place his happiness in the possession of riches, someone else in the gratification of his thirst for glory, or yet another in his desire to do good to his fellow-men ? What is it that renders one man distinguished for his success in poetry, or music, or, mathematics or, say, statesmanship ? Why is it that in all ages and throughout all countries robberies and murders have been committed, and neither education, legislation, religion, the prison, nor the gallows, have yet been able to extirpate these crimes ? Look at the large amount of domestic unhappiness from lack of a proper understanding of the character and motives of husband and wife ! Glance at the miseries of men whose career was determined by their parents against their natural inclinations and the consequent loss of brain capacity to the State ! Look at the crimes committed by persons in those early stages of mental derangement which none but an expert knows to be indicative of insanity ! Think over all these problems, and you will arrive at the conclusion that there is one subject of study which has hitherto been neglected, namely, the study of human character.

There is no science which has up to now essayed to reveal, with anything like completeness, the primary mental powers, or to demonstrate their modes of operation, to account for the peculiar mental build of each individual or for the wide contrasts perceptible in the characteristics of nations. We have had abundance of fruitless speculations, but no scientific data ; and amid such lamentable deficiency how greatly have the interests of education, legislation, and morals suffered ! The diversity of opinions has in every age increased with the diversity of writers. Libraries are teeming with philosophical treatises, yet we are poor in the midst of such abounding riches, and have had no work on the science of character. It would appear that the ancient Greeks were closer students of what they called **ETHOS**,

the heart or soul of man, which they held to be the seat of his intellect, feelings, desires and passions, than were the philosophers who succeeded them, not excluding even the great thinkers of the present day. Thousands of years have gone by and we have still no standard whereby to measure man.

We have seen that GALL's doctrine furnished the first rudiments of a science of character, but that doctrine was ignored, or condemned, by psychologists under the mistaken notion that it was akin to the faculty psychology. After him, JOHN STUART MILL, stimulated by Comte, a supporter of Gall (see Correspondence between Comte and Mill), drew attention to the necessity of a science of character. Later BAIN and SPENCER, as we have seen, worked more or less on Gall's lines; but even Spencer paid more attention to perceptions and ideas than to feelings and action. It is only within quite recent years that a number of writers on so-called Social Psychology, without being aware of what had been done already in that direction by Gall's followers, have contributed a variety of books and papers on the subject of character and conduct; to mention only Ribot, William James, Alexander Sutherland, McDougall, A. F. Shand, Charles Mercier, Harry Campbell, Drever, Mott, Hyslop, Armstrong-Jones, Parmelee, Coriat, Boris Sidis, Tanner, W. Trotter, J. B. Watson, etc. **It was JOHN STUART MILL** ("Logic," bk. vi., chap. v.) **who first suggested the name ETHOLOGY for the scientific study of character.**

"A science is thus formed to which I would propose to give the name of Ethology, or the Science of Character, from *ethos*, a word more nearly corresponding to the term 'character,' as I use it here, than any other word in the same language. The name is perhaps etymologically applicable to the entire science of our mental and moral nature; but if, as is usual and convenient, we employ the name Psychology for the science of the elementary laws of mind, Ethology will serve for the ulterior science which determines the kind of character produced in conformity to those general laws by any set of circumstances, physical and moral. According to this definition, Ethology is the science which corresponds to the act of education, in the widest sense of the term, including the formation of national or collective character as well as individual."

Etymologically, the word *ethos* is applicable to the entire science of our mental and moral nature, and the scientific views of *character* should embrace the totality of all the mental and moral peculiarities: the intellectual abilities, judgment, imagination, the emotions, passions, animal propensities, moral virtues, the æsthetic, worldly, and religious life and aspirations.

Ethology is the science of Human Character and deals with human action or conduct. Of course, the basis of conduct is the reaction to environment. But all action or conduct is dictated by certain motives and springs from certain habits or dispositions. A science of character, therefore, must be essentially a science of the **motives of conduct**—motive being that characteristic tendency or disposition of man in virtue of which a given act possesses an attraction for him.

The character of every man depends partly on innate potential dispositions and partly upon external circumstances. It is expressed, in the first place, by his mode of reaction to his environment according to his choice among his own innate or acquired tendencies—that is to say, the usual manner of his behaviour; secondly, by the emotional energy of his actions, which may decline as habits are formed; and, thirdly, by the intelligence with which ends are comprehended and means adjusted to them.

The older psychologists did not admit the innateness of the primary motives of human conduct, but held that the sensation of pleasure or pain determines our actions.

For example, according to BENTHAM, a motive is substantially nothing more than pleasure or pain operating in a certain manner. And according to LOCKE,

the feeling of pleasure or pain is the motive to action or inaction. We strive for riches because we recollect the pleasures which they can yield to us; we are deterred by punishment because we recollect its pain. These are the motives which Utilitarian philosophy regards as the mainsprings of our conduct. They influence us very greatly; but there are stronger forces, some of which lie beyond the apprehension of our consciousness.

Happiness, like health, is one of the things of which men rarely think except when it is lost. Most men are unconscious of their faculties until they become obstructed or impaired.

The pleasure and pain theory does not account for actions of self-denial, nor for the actions arising from anger and fear. Furthermore, every emotion has a potential disinterestedness, so far as among the stimuli are some which excite it on behalf of another individual instead of on behalf of one's self. There are selfish emotions which are disinterested, as when an animal experiences the emotion of fear and sacrifices its own life to save that of its offspring.

What is the fixed emotion of avarice? Is it the joy of the avaricious man in the possession of his wealth, present in the thought of it, expressed in the handling of it? This at least seems to be the centre of his passion in favourable circumstances, to which his activities converge. But suppose that he loses his wealth or a part of it; or even that he fears to lose it. What becomes of his joy? Is it replaced by sorrow or fear? But if his passion is identical with joy, then it ceases to exist, because the joy felt in the possession of its object is replaced by sorrow at its loss or fear at its apprehended loss. On the contrary, the sorrow and the fear are both evidence of its continued existence. If the avaricious man did not feel them in the appropriate circumstances, he would not love his wealth.

The same law is exemplified in the case of love of approbation. The enjoyment which it affords depends on its active state; and the necessity for more incense, and for mounting higher in the scale of ambition, is constantly felt by its victims.

The passions cannot be classified as merely pleasurable and painful; for **the passions ranked as pleasurable are seldom pure or unmingled with pain.**

Thus the happiest love is rarely clear from all pangs of jealousy, or the brightest hope from all sufferings of apprehension. And as though it were preordained that no human enjoyment should be complete, even when at the summit of our wishes, and under the full gratification of our most ardent passions, fears and forebodings of change will almost always sully the purity of our happiness. The same is also true of our painful passions. Most rare is it that we find them wholly unmitigated by those which are pleasurable. Some faint beam of hope will penetrate even the deepest moral gloom. It is questionable, then, whether any of the passions, could they be perfectly analysed, would be absolutely free from any mixture of their opposite. A large proportion of the painful passions in society are the offspring of such as are pleasurable. We suffer because we have enjoyed. Our present state is darkened by contrasting it with the brighter past. The reverse also holds true: as we suffer because we have enjoyed, so do we enjoy because we have suffered. Knowledge, too, or the enlargement of our ideas, in opening to us new fields of desire, and causing new comparisons with our present condition, becomes a frequent sourse of discontent and the various painful passions of which it is the parent. Thus does our happiness too frequently depend much less on what we are, than on what we have been.

We have seen that **some philosophers based human conduct on the pleasure of sympathy,** but moral conduct which is founded only on the pleasure of gratified sympathy stands on a somewhat insecure basis. Much of the sympathy which impels us to moral action is most unpleasant.

A man sees a woman cast herself from a bridge into a cold and turbulent stream; while he runs round to plunge in from the bank he may have time to think of the chill he is sure to get, of his ruined clothes, of the considerable chance his wife has of becoming a widow and his children of becoming orphans. He feels no pleasure in the prospect, nothing but anger that the woman should have been so wilful, and yet it is impossible for him to stand callously by and see her drown. If he tried to do so, something would boil in his blood, and as the time for useful action grew near an end, in spite of himself he would take the plunge and face all the inconveniences. Possibly enough, after he has got the woman out, he may feel no particular glow of pleasure, but only the chill of streaming underclothes. Thus sympathy is an emotion which, though in the main it gives pleasure, is by no means essentially pleasurable; and we act upon sympathy not to please ourselves, but in obedience to certain primitive instincts—very often without thinking—which have been bequeathed to us by our ancestors, because without these instincts our ancestors would have failed to survive and we should never have existed.

We have propensities, i.e., organic impulses, to make us follow certain paths of life; but we are not following them because these propensities serve a definite and ordained end in nature, but because the satisfaction of the impulse is accompanied by a pleasurable feeling.

The animal is aware of the sensation of hunger and experiences appropriate pleasure from the food its taste approves of; but it has no knowledge that the assimilation of new material is an indispensable necessity in the maintenance of animal life. Like the animals, so do we do innumerable things to which we are led by purely organic impulse; things which indeed have a reason and a use, but a reason which we never know, and a use which we never discern, till we come to think. Such thinking, which we apparently do in obedience to a higher voice, is peculiarly human, and never wanting even in the most degraded of human beings. This impulse, disposition, and ability to reason, is as intuitive and congenital in man as the disposition to eat.

None of our faculties seek pleasure for its own sake, although pleasure results from their attaining their ends. A woman loves and tends her children, and it makes her happy to do so; but she does not love and tend them that she may feel happy. And so of all our desires and motives to action; they none of them have happiness directly for their object, but if pleasure did not follow from the pursuit, or unhappiness and pain from the neglect, they would cease to be motives.

The greater the strength and activity of a mental quality, the greater the pleasure attending its exercise. To a person with a highly developed æsthetic sense to behold a beautiful picture will be pleasurable; to an unmusical person, music may create a painful feeling. Happiness signifies a gratified state of our faculties. The gratification is achieved by exercise. To be agreeable, that exercise or pursuit must be proportionate to the energy of the aptitude or disposition; if it be insufficient, discontent arises, and its excess produces weariness. **To achieve complete felicity is to have all the mental powers exercised in the ratio of their respective development.**

A man is tender, hard, credulous, cynical or benevolent as a result of the predominance of one or more innate qualities which turn the scale in that direction, and, whatever his disposition, he desires gratification from following it; he acts in certain ways because it suits him to do so. In one order of mind there is happiness in relieving the suffering or misery of others; in another order of mind there is happiness in adding pound to pound. Everyone acts according to his own disposition, but those deeds are most praiseworthy which are for the good of the largest number.

The propensities are simply rudimentary impulses whose expression is wholly determined by the social environment. Mental life is rooted in the propensities. It

is not true, as JAMES has said, that man has more " instincts " than animals ; but it is true that he has more propensities than any single species of animal.

In all the higher animals there is a highly developed nervous system, with multitudes of connections between its elements. These connections are pathways of nervous currents. Many of these connections are inborn and seem to be as much a part of the heredity of the individual and the race as physical characteristics. The nervous system is thus characterised by a multitude of more or less perfectly developed pre-organised reactions which are a part of the individual's heredity. **Propensities are then inborn pathways of nervous currents,** which have as their functional correlate inborn motor tendencies, and as their psychical correlate inborn psycho-physical dispositions. They are evidently the psychological aspect of racial heredity, and it is as inconceivable that the organic individual should exist without them as without the equipment or general bodily structure itself. As **propensities are not acquired by the individual, but are given in the germ, they are transmitted from generation to generation,** varying only as other biological characteristics of the stock also vary. Inasmuch as they are characteristics of the highest and the most unstable portion of the organism, the nervous system, they probably vary more widely than the grosser physical traits. They are more modifiable and alterable, owing to the fact that only about one-third of the connections of the nervous system are made at birth, the other two-thirds being acquired by the individual during his lifetime. These acquired connections must, of course, very greatly modify the character of the original connections. There are in man, therefore, no definite, hard and fast instincts such as characterise the lower types of animals, but rather a complex series of propensities to action. Repeated resistance to impulses builds up a habit of self-control ; repeated yielding a habit of self-indulgence. The crimes and follies of mankind are mainly due to the uncontrolled operation of the propensities (the " flesh " of theology).

EVOLUTION OF THE MENTAL POWERS

The first step to be taken towards the formation of a science of character is to analyse human behaviour and endeavour to ascertain what are the primary mental powers. Without such classification one cannot proceed in any methodical way to describe individual character. But it must be understood at the outset that **these mental powers are potential only ;** that they are only presumably primary, but on further investigation may be found rather complex ; that we still lack suitable terms for many of the fundamental capacities, instincts, and propensities ; and that, though we shall describe them singly, **they do not act singly,** but that intellectual, emotional and volitional activities are inextricably intermingled. The method we shall follow is what we have already described as the " natural history " method. As we have seen, the defect of the earlier attempts at a classification of the impulses which are the mainsprings of behaviour has been that their authors treated man too much as though he stood alone in the animal creation, as if his propensities and capacities could be studied without reference to the connections which may be established between them and like endowments of the lower animals. But **there are a number of elementary powers which we possess in common with animals,** which are aroused spontaneously, and are implanted by nature for the preservation of the individual and the race.

Man and animals being in a world, the inhabitants of which devour one another, the most important safeguard with which they are endowed is the **propensity of self-preservation.** This consists of several dispositions. First of all there is the **love of life,** giving a disposition to guard themselves against mechanical injury and destruction. In order to maintain existence, the animal must have a **propensity to seek food.** Since many animals and man live on other animals a **propensity for**

aggression is necessary, and in order that they themselves may not be devoured they must possess a **disposition for self-defence**; these tendencies giving rise to the emotion of **irascibility,** which increases the natural strength of the animal. But not all animals are endowed with weapons for self-defence; nature has provided them, therefore, with a **disposition to take flight** and a **disposition to conceal** themselves and their intentions in case of danger; and, in order not to be taken unawares, nature has endowed them with the **emotion of fear** and the **feeling of suspicion.** Food not being always available, some animals developed a **propensity to hoard** nutrient materials, and some developed for their protection a **propensity to construct** a habitation for themselves and their offspring.

The continuance of the species was assured by the provision of a **sexual propensity,** and when young were born there developed an **attachment between parents and offspring.** The young growing up together formed an attachment to one another, giving rise to a feeling of **affection,** and frequently they became attached to the place in which they grew up, and thus developed a **love of home.** Family life taught them that there was greater security in numbers, and thus developed the **gregarious propensity** and the foundation of social life. For the individual to live in a group a certain conduct favourable to the preservation of the herd was necessary, and those who conformed would meet with the approval of their fellow-members. Thus arose the **love of praise** and dread of blame. Some members of a group, being more gifted than the rest, would take the lead and thus acquire **self-reliance** and **tenacity of purpose.** The self-preservative propensities brought man into collision with his fellowmen until he was schooled into respect for each other's interests. From this moment was established the principle of **altruism,** which is at the root of all moral progress.

For the acquisition of food and the maintenance of self and the species **powers of observation** are necessary. These impart **retentiveness** and supply the essential material for practical knowledge. By the comparison of past experiences with the present, and tracing causes and effects, the **reasoning powers** arose. Man, being endowed with **speech** in addition to the language by gesture which animals possess, could think in the abstract as well as develop **powers of imagination,** with which he could endow certain objects with greater excellence than others; thus developed the **æsthetic sense.** Imagination renders persons susceptible also to impressions of happiness and distress in others; and where there are no strong antagonising motives in the mental organisation, feelings of justice, kindness, charity, and generosity, *i.e.*, **ethical** and **altruistic sentiments,** may arise. Moreover, the grandeur of natural phenomena impressed him and aroused in him **feelings of awe and wonder and reverence.** Believing these phenomena to be caused by supreme powers, and in time by an Almighty Power, the **religious feeling** was aroused.

These are, briefly sketched, the primary mental powers, with which we shall deal in detail in succeeding chapters.

EMOTIONS AND PROPENSITIES versus INTELLECT

Psychologists have concerned themselves greatly with the reason of man, as though the human mind comprised within its domain nothing further than mere intellect, but we all have propensities which give rise to desires, and **we all feel and strive as well as think.** Indeed, the feelings and propensities are the prime-movers of the intellect and of the greatest biological significance. (Even WILLIAM JAMES, who furnished us with a new theory of Emotions, devoted nine-tenths of his "Treatise on Psychology" to the consideration of the Intellect, and only one-tenth to Feeling and Will.) Our judgment is oftentimes influenced by our desires and feelings; in too many instances, indeed, the intellect is made the servant of the feelings and propensities. Rouse the emotions and men cease to reason, for the emotions focus

the ideas and actions of a man into one channel, cutting off all other thoughts, impulses and incipient actions.

Men are animals first and reasonable beings afterwards. Notwithstanding all that has been said of the "nobility" of the intellect, men's lives are not determined by it, but by their propensities and emotions. We experience satisfaction, discontent, anger, fear, jealousy, hatred, or grief spontaneously, and these conditions influence our mode of thinking. These feelings are part of our organisation because there are objects and events which from their nature must be detested or loved, desired or feared, for the preservation of the individual or the species.

According to BERGSON, the intellect has been formed to serve the purpose of activity which we call life. "Knowledge is for life, and not life for knowledge." If Bergson means by life the manifestation of the natural propensities, he is quite right; for the intellect serves for their gratification, and not the propensities for the service of the intellect.

Man may exist without reflection, but scarcely without action. **The emotions and propensities supply the dynamic energy to human conduct.** Without them there would be no stimulus to the exercise of the intellect; for the intellect can appreciate facts but cannot supply motives. In judging a man, we have to ask what are the motives that habitually determine his conduct, whatever be the means his intellect may devise for the attainment of his ends. But all propensities have a good purpose; only when wrongly directed do they become vicious. *On their activity depends all the good and evil in life.*

The cat may see the mouse, but that has no effect upon her if no emotions are thereby aroused. The mouse may see the cat, but its subsequent activity is due to the emotions thus induced. Why should a man pick up a lump of gold at his feet, even though his intellect should inform him first that it is truly gold and that certain things might be procured in exchange, unless he has some desires, some hopes, which gold may satisfy, or some fears which gold can alleviate? Even the study of science is maintained only by emotion. It may be the emotion of ambition, or some other stimulus, as a feeling of curiosity. It is plain at least that without emotional stimulus we obtain no sort of return for our labour, and only through our emotions can we find any motive for it. Fame and wealth are the two most powerful incentives to human enterprise. One man may have a magnificent intellect, but no emotional stimulus to exert it; another may have poor talents, but, with the capacity for taking pains, may know how to turn his abilities to good account.

The influence of certain politicians and sections of the Press is so great because of the appeal they make artfully and successfully to the people's emotions. Indeed, many of the "intellectuals" are moved by it against their previous convictions, and those who hold fast are in a minority and muzzled for the safety of the herd.

The affective tendencies—that is, the feelings, emotions and passions, differently named according to the degree of their intensity—**preponderate over the intellect** and determine the nature and life of the individual. **Man only thinks as he feels.** The feelings promote thought, unless they become too strong, when they inhibit intellectual activity. Were we deprived of our feelings, the remainder of our consciousness would amount to nothing; our sensations would lose their pleasure and pain; our thoughts would be bereft of all interest and vitality; our convictions and ideals would lack the quickening touch of the spirit, and fall as empty sounds on deaf ears.

Education, law, public opinion, tend to repress impulses and to produce uniform conduct; but nature will out. One man is still more affectionate, less ambitious, more amorous than others; and that these peculiarities are innate, and not the result of education or training, is evident from the contrasts which we observe between members of the same family.

If the propensities for self-preservation were untutored, every man would have impulses for killing, thieving, lying, etc.—though we do not always call them by these names. Their existence is shown in certain states of clouded consciousness and in brain disease, when these propensities manifest themselves in their full vigour and in the coarsest manner. Because of this untutored manifestation, these propensities have been called evil or immoral; but they are simply non-moral. For only out of action can morality be evolved, and only by desire can primitive man be spurred into action.

The feelings are not only far more extensive in their action than the intellect, but are more important for health and sanity. In mental derangement, the primary disorder usually consists in a tendency to disordered emotion, which affects the course of thought, and consequently of action, without disordering the reasoning processes in any other way than by supplying them with wrong materials.

The greater the intellect of a man, the greater the check upon his emotions and passions. The lower the power of the intellect, the more freely do the feelings influence the actions of the individual. Hence a child, a savage, and persons of no culture are little able to restrain their inclinations. Hence also in injuries to the intellectual region of the brain, the loss of control over the propensities. But reason seems to have that power only by exciting a higher feeling to suppress the lower, so that the struggle is, as a rule, between feelings, and not between reason and feeling. The feeling is first aroused, and the intellect steps in afterwards.

Consequently the ready response of the primary emotion when a man is offended —to fight someone—the first animal propensity. An irascible combative person knocks a man down, and thinks and reasons about it afterwards; there is a blow and a word, not a word and a blow. And so, of all the feelings, we often act upon the mere impulse; self-consciousness, or reflection, comes afterwards.

In any given individual **the intellect may be highly developed, and the passions and emotions very ill developed,** or the reverse.

The fool may have a kind and affectionate heart, and the criminal a quick wit. Of course, intellectual and moral defects may also co-exist. Were intellect not entirely distinct from emotion (a view not shared by the great majority of psychologists), the complete idiot would be also incapable of manifesting any emotion; whereas, on the contrary, his emotions are manifested the more strongly for lack of the inhibitory control of reason.

The propensities are the basis of the higher powers; and whilst the emotions and propensities can exist without intellect, intellect cannot exist without them. Indeed, without the promptings of the propensities, men would die. We do not live for the purpose of gratifying our propensities, but we exercise our propensities in order to live.

In some persons the animal, the baser nature, would appear constitutionally to predominate, the passions readily breaking from the control of reason, and bringing too often sorrow, shame and disease upon the unhappy individual. In others the reverse of this is true; the intellectual nature holding the supremacy, ever keeping the feelings under a just restraint; and fortunate indeed are they "whose blood and judgment are so well commingled."

As the good tendencies greatly preponderate in some natures, so do the bad in others; and we meet those who scarce ever from their childhood manifest an amiable or generous feeling. Such extreme cases, however, are fortunately but rare. Generally there exists in our composition a due mixture of the good and evil dispositions: "Our virtues would be proud if our faults whipped them not; and our crimes would despair if they were not cherished by our virtues." Virtue depends on the successful struggle with our evil dispositions. Chastity would be no virtue in one without carnal desires, nor clemency in him who was incapable of

hatred or anger. The poets glorify their gods by making them war with demons. As the artist heightens and sets off the bright and beautiful colours of his canvas by the dark shades with which he intermingles and contrasts them, and exaggerates the beauty of his angels through the ugliness of his devils, so does Nature on her moral canvas enhance the lustre and comeliness of virtue by the very shadows and deformities which she throws into the picture.

Finally, there are those who from very early existence are distinguished by the predominance of some particular passion as fear, anger, or ambition ; that is, they are constitutionally timorous, irascible, or aspiring in their tempers. Education, however, may do much in repressing passions originally in excess, and developing such as are deficient ; and herein consists **moral culture,** so vitally essential to our health and happiness.

The emotions predominate over the intellect by their **stability** and **relative duration.** Perception, thought, contraction of the voluntary muscles are instantaneous functions. They are scarcely begun before they are ended. The emotions and their muscular and organic effects are slow and more lasting. Only by their abuse can they be more quickly aroused. To become angry takes an appreciable length of time—minutes, or even hours, according to the organisation of the individual and the exciting cause ; and when the passion is fully aroused it continues for some time and passes off. Some of the emotions occur at such an early period that there is no possibility of their expression being in any way due to imitation. They are forms of instinctive reaction to the objects that excite them.

Some children from their earliest years are more timid or more courageous, more secretive or emulative than others ; some are naturally inclined to jealousy and others to affection. Violence of temper is often associated with exceedingly good health. We must note that one may be of a timid disposition and yet be not inclined to anger or jealousy, and be affectionate and be still lacking in courage. We must also note that the infant feels anger, fear, attachment, before it is alive to the sublime or beautiful ; and it observes occurrences long before it reasons.

The intellectual capacities and the emotions are two distinct sets of mental powers ; but, in their manifestation, are commonly blended together. A feeling of some kind arises at or about the same time as the idea and is associated with it. On the other hand, just as the intellect may work independently, so the emotions may manifest themselves primarily without any ideas.

For example, there is often anxious feeling without any idea. The individual experiencing that feeling may seek for a cause and may fasten upon some idea ; but the feeling comes first. A man may be in a state of irritability amounting to anger, before he has been opposed or had occasion to find fault. It relieves him when he can discharge his anger on some individual or object, though he or it may be innocent of any offence. In the various disorders of the bodily organs, glandular secretions, arterial changes, there are often remarkable emotional states, for which the patient may account in a legitimate way by events in his mental life, not suspecting their physical origin, until the bodily disorder is so marked that he feels compelled to consult a physician.

THE NATURE OF INSTINCT

Much confusion has been caused by the actions of animals being referred to instinct ; whereas the thoughts and actions of men have been referred to intellect.

One bird as soon as it is hatched runs into the water, and it is said it does so by instinct. Another sings by instinct. Others migrate by instinct. Some animals make provision for the winter by instinct. Now, though we cannot call in question the propriety of such a term, can we suppose that the one entity—instinct—will explain all these various phenomena ? On the other hand, all the actions of men

have been referred to intellect; but though intellect is necessary for the successful prosecution of human affairs, yet does it explain how one man may possess a taste for music and exhibit no talent for mathematics or poetry; or how a man may be a natural orator and excel neither in poetry nor mathematics? This diversity of talent, I am aware, has been attributed to the peculiarities in the mental constitution, and the opinion is so far just; but it is not sufficiently explicit. We shall account for it in succeeding chapters.

Man is born with certain innate capacities, and he is born with desires to exercise these capacities. The same is the case in animals. These capacities are at birth mere potential tendencies, and even an instinct is only a tendency. For example, nest-building is an instinct in the bird; but which particular tree, and which branch of the tree, shall bear the nest, these are not predetermined. There is no internal compulsion in the bird to select one tree rather than another. There is freedom of choice in that respect. That is to say, while the act of nest-building is determined, in its main features, by internal organisation, and is in this respect instinctive, it is subject in its details to the operation of choice in adaptation to circumstances, and is, in this respect, reasoned. Moreover, the animal can take up its instinctive work at any time, at any stage, and pass from one business to another.

Instincts may appear mechanically performed, but they are not; for **instincts may be altered.** All living organisms have the power of improving their position by adapting themselves to external conditions. Such adaptations imply intelligence. There is no instinctive behaviour without an intelligent factor; and there is no intelligent behaviour without an instinctive factor.

Instinct in man is a term generally used in describing that part of human character and conduct which is not the outcome of a consciously rational process; but **there is no "pure" instinct in man,** such as exists, for example, in insects. It is always associated with ideas in the adult human being. For this reason I propose to reserve the word "instinct" for such innate capacities as are followed by behaviour more or less automatic, and to which the whole species reacts in exactly the same manner; and I call "propensity" an innate impulse to action, which is neither automatic nor uniform, but is controlled largely by the animals' intelligence. Adopting this view, animals have both instincts and propensities; but man has only propensities. They impel him to certain actions, but there is no innate guidance how that action is to be performed. The elements of knowledge and skill are lacking, and the impulse to act is not necessarily followed by its execution. ("Sucking" in the human infant is regarded as instinctive, but resembles rather reflex action.)

A person may have, for example, the propensity to hoard very marked, and manifest it in a desire and conduct "to get rich." The acquisitive propensity being so strong in him, he will seek ways and means to gratify it. Therein he has choice in accordance with his innate abilities and the circumstances in which he is placed. He can exercise his reason to discover how to gratify the tendency, the active exercise of which gives him pleasure.

Instincts, in the lower animals, dictate the end, and not only the end, but to a considerable extent the means by which the end is achieved, and leave but a margin, larger or smaller, to the guidance of reason. Propensities, whether in man or animals, give rise to desires for a particular end, but leave it almost entirely to reason to discover the means of attaining that end. If man were provided with instincts, and not merely propensities, he would not require such a long period of protection and instruction. What we call moral education is really largely the proper direction of the propensities.

Take the nutritive instinct, *i.e.*, the instinct of the animal to obtain food for its

sustenance. The chick, immediately on leaving its shell, has not only the impulse to seek food, but knows how to obtain it; and all chicks act alike in their manner of procuring food without previous teaching. The human being, on the other hand, has merely a propensity to acquire food. He requires to be taught how to obtain it (even in "sucking"). Such desire for nutrition arises out of, or is excited by, physical conditions of the stomach, or system at large, which demands the supply of food and drink, and thus serves as monitor to solicit the co-operating acts necessary to furnish such supply. Consequently, animals, as soon as born, and independent, of course, of education or imitation, go through, and as perfectly as ever afterwards, all those complicated muscular movements requisite to meet the demands of nutrition. The human being, however, hungry and with food placed in front of him, if untrained and left to himself, would starve.

Instinctive action resembles reflex action, but is not carried out with the same fatal promptitude immediately upon the stimulus; being more complex—consisting of acts, rather than mere movements, and being accompanied by feelings. Consequently it includes a sort of consciousness, though not consciousness of the actual end of the action. In the reflex movement, on the contrary, every form of consciousness has entirely disappeared.

The more instincts an animal has, the more it leads a life of hesitation and choice—an intellectual life. Apparently, because it has no instincts; really, because it has so many that they conflict with each other. Thus man is more uncertain in his reactions than the lower creatures, because he possesses all the primary propensities that they have, and a great many more besides; but they become greatly modified; firstly, owing to the greatly prolonged period of immaturity and consequent parental protection; secondly, owing to the possibilities of profiting by tradition—the store of acquired knowledge—being immensely increased; and thirdly, owing to the great development of his intellect and moral sense.

What constitutes the superiority of man over animals? Does he excel them by the possession of more exquisitely constructed senses? No! In this respect he is inferior. The eagle has a keener eye and the dog an olfactory apparatus of much finer susceptibility. Do we find man's superiority in the instincts? No! The instincts of animals are more powerful than ours, for the wants by which they are expressed manifest themselves more clearly, and are satisfied by actions of much greater energy. Nor is the difference between human and animal types due to the monopoly of mind by man, but solely in a greater development of the intellect and moral sentiments.

The fundamental character dispositions are common to both man and animals. Affection, love, hate, discontent, satisfaction, envy, jealousy, revenge, magnanimity, courage, fear, anger, joy, love of approbation and pride, are not human attributes alone—all of the higher animals possess them. Only the perception of the sublime and the religious emotion are absent in animals, because they depend upon ideas of too abstract a nature to be reached by the mind when unaided by the logic of signs, that is, without language. All the other capacities animals seem to possess too, but most of them are very slightly developed.

It is impossible to deny that **animals possess intellectual capacities** to a certain degree. Some possess even better powers of observation than man; and they possess understanding, though not in the same degree as man. They evidently retain the images of bodies, and are perfectly able to recognise objects which they have once seen. We cannot be convinced of this by any oral testimony on their part, but it is proved by induction.

Though a dog cannot speak and communicate his feelings, it is evident that he recognises his master, or any other individual with whose person he is familiar: that he becomes attached to his benefactor, and avoids those who treat him ill; that he has perfect remembrance of the shed which covers him, etc. A thousand facts prove

that he thinks of these objects when far removed from them, regrets their absence, and views with pleasure preparations for a journey which he imagines will bring him nearer to his home. The dog, therefore, like ourselves, possesses sensation, perception, comparison and memory, and in many cases he seems only to want language to become an intelligent being. We might even accord him a sentiment of personality, but this he is unable to express.

Animals are quite as able to form abstract ideas as we are, if under abstract ideas we include general ideas of qualities which are so far simple as not to require to be fixed in our thoughts by names. **Animal intelligence is unable to elaborate that class of abstract ideas the formation of which depends on the faculty of speech.** It is wholly impossible to over-estimate the value of language as thus the handmaid of thought. For, in the absence of language, it would be impossible for thought to rise above the very simplest of abstract ideas, while, in the presence of language, it becomes possible for us consciously to predicate qualities, and so at last to feel that we are conscious of our own consciousness.

Were not the various qualities of the understanding manifested by animals identical with those possessed by man, there could be no intercommunication between man and animals; for without this mutual intelligence the rider could not manage his horse, nor the sportsman direct his spaniel, nor the pig-boy drive his pigs, nor the blind man be led and guided by his dog. Animals and man must understand each other, otherwise animated nature would be a confusion. Even sounds of the voice and the meaning of words are frequently understood by animals as distinctly and fully as they are by ourselves; and the intent and object of our actions are perceived by them in the same sense as we intend them to be perceived. Thus the horse knows the sound of the trumpet, the sound of the whip, and the driver's bidding; the hound responds to the huntsman's horn; the cat minds the maid-servant's call, and the cow obeys the cry that hails her home to be milked. The mechanism of the beaver is like our own, and the fox pilfers our poultry-yards with the same adroitness as the thief pilfers our coffers. Thus the intelligence of animals is the comparative anatomy of the understanding of man; what is one in us is several in them. They are the analysis of the mind of which we are the standard and type. By pursuing this train of reasoning we might show that the less perfect understandings in man approximate to the lower understandings of animals. Thus we say as stupid as an ass, as filthy as a pig, as timid as a lamb, as cruel as a tiger. The higher human understandings admit of no such debasing comparison, since they cannot be likened to anything else than themselves.

The primitive propensities which prompt man do not manifest themselves in the same rude and open manner as they do in animals. Nor are animals hindered in the manifestation of their innate qualities by restraints. On the other hand, man receives a long process of education, and is surrounded by restraining forces, such as family ties, public opinion, communal interests, besides the activity of his understanding, which all help to control the impulses which urge him in certain directions.

Man, like the animal, has to kill that he may eat, has to oppose aggression and to shun danger; he has pleasure in eating, drinking, sleeping, and exercising his limbs; and one of the greatest obstacles to improvement is that so many of the race are contented with this enjoyment, and consider it painful to seek higher sources of gratification. Man has added to his animal nature moral sentiments and reflecting faculties. But this peculiarity attends them: that while the animal propensities act powerfully of themselves, his rational faculties require to be cultivated, exercised, and instructed before they will yield their harvest of enjoyment. Therefore, the necessity of moral education of his young: to develop the higher human sentiments in the child and to leave the lower instincts inactive, or, at least, to put them under control. Evil thoughts and deeds were at one time ascribed to the instigation of

the devil—no doubt their manifestation is due to some form of temptation ; but it is we alone who are responsible for making wrong use of the powers which are given to us. Of course, it is not always wickedness, but sometimes also ignorance, that leads to their unwarranted manifestation.

Man has an insatiable appetite for knowledge, for the discovery of new truths, which is the stimulus ever urging him forward in the path of intellectual endowment. The relations of an animal to the objects among which it is placed have reference chiefly, if not solely, to the gratification of its appetites, or the satisfaction of its bodily wants, and its preservation from injury or destruction.

Its sensual desires gratified and unthreatened by danger, it commonly falls asleep, or at least remains at rest. But such is not the case with man, certainly not with civilised man. With his appetites satisfied, with ample provision for every physical necessity, and exempt from even the remotest apprehension of harm, still, actuated by a class of wants above those of his mere animal nature, does he remain awake—observing the objects and phenomena about him, reflecting, perchance, on his own mysterious constitution and its intricate relations, observing what passes within himself ; or, unsatisfied with the present, stretching his view far into the dim, uncertain future, and judging, or trying to judge, of its fast-coming events. Nor is his expanding mind bounded by the world in which he dwells ; he grasps at the universe and eternity, and space and time are too limited to contain it.

Man has the advantage above animals of being able to profit more largely by experience, the results of which he can communicate to others, in like manner as he can avail himself of their experience ; and this is communicated by one generation to another—each adding, as it were, fresh layers to the sum of human knowledge. The instincts of animals lead to no progress.

The beaver constructs his habitation, the sparrow his nest, the bee its comb, as did their ancestors thousands of years ago ; while man, owing to the records of past experience, has been gradually advancing to a higher and more perfect state of development—each generation profiting by the learning and experience of those that preceded it, and in like manner transmitting its knowledge and attainments to those that come after.

Very young children present in their mental constitution, in common with animals, chiefly those mental powers which we call propensities. With advancing age, the first indication of true intelligence seems to consist in the power of forming special associations. Memory thus appears early in life, and long before a child is able to speak it links together in thought ideas of objects which it finds to be associated in fact. Again, the emotions begin to assert their presence at a very early period, and attain a high degree of development before any of the characteristically human faculties can be said to have appeared. Moreover, in young children we meet with nearly all the emotions occurring in animals, and their general character is much of the same kind. In more advanced childhood, the emotions of children resemble more those of savages. With regard to the more purely intellectual faculties, language is largely intelligible to a child long before it is able to articulate ; but soon after it is able to articulate the power of abstracting qualities and classifying objects by the aid of signs begins its course of development.

But, in comparing the intelligence of a young child with that of an adult animal, we are met with this difficulty—that as the bodily powers of children at so immature an age are so insufficiently developed, the mind is not able, as in the case of animals, to accumulate experiences of life. In order, therefore, to obtain a fair parallel, we should require a human being whose mental powers have been arrested in their development at an early age, so serving to supply the aborted human intelligence with full experiences of life. Now, the nearest approach we have to these conditions

is to be found in the case of idiots. There are, of course, all degrees of idiocy. As we descend in the scale from the higher to the lower grades, so we find the characteristically human faculties are the first to disappear, while those faculties which man shares with the lower animals persist. Or, reversely, as we ascend in the scale, so we find first the animal faculties only, and higher in the scale, some of the more characteristically human.

THE WILL AND THE POWER OF CHOICE

We have eyes to see, legs to walk, and a nervous organisation with which to think and feel. The legs are instruments to give us the freedom to walk where our desires direct us ; the eyes are instruments to give us the freedom to look at what appeals to us, and the brain-cells serve as instruments for certain elementary capacities and dispositions, which give us the freedom of the loftiest thoughts and most supreme feelings. We cannot walk without legs, nor see without eyes, nor think or feel without a brain. Any defect in these instruments restricts our liberty. We must grant the existence of the instruments, but no one can tell what use the individual will make of them.

We can make a teleological teddy-bear that will walk across a thoroughfare, but not a teddy-bear that will choose the route and will avoid the traffic. The man who thinks grand thoughts, feels beauty, aspires and loves, is the citizen of an ideal world ; no theory of philosophy can make an automaton of him. Fatalism is wrong. There is no predestination, though there is a plan in the universe. There is a desired goal, but not a destined goal. For example, every healthy child is planned to live to eighty or a hundred years ; but that is not its destiny.

Usually three meanings are distinguished, in which **freedom** is attributed to the Will or " Inner Self " of a human being :

(1) The general power of choosing among different alternatives of action apparently without a motive, or against the resultant force of conflicting motives ;

(2) The power of choice between the promptings of reason and those of appetites (or other non-rational impulses) when the latter conflict with reason ;

(3) Merely the quality of acting rationally in spite of conflicting impulses, however strong.

It is obvious that freedom in this third sense is something quite distinct from freedom in the first or second sense ; and, indeed, is rather an ideal state after which the moral agent ought to aspire than a property which the human will can be said to possess.

It very frequently happens that a desire passes at once into action, so that we are not conscious of an interval between the two, as in the satisfaction of the propensities. But it also frequently happens that there is a conflict of desires, causing us to reflect and compare the consequences which would result from the gratification of the several desires. It also occasionally happens that, even when only a single desire is operating, something occurs to suspend its passing into action. In both these cases we are conscious of an interval between the desires, or the conflict of desires, and the action which is the result. The interval may be so brief that we can hardly detect it, or of a considerable duration. To this act of determination we give the name of **volition.** The Will, by those who regard it as an independent part of our nature, is supposed to be the source of these volitions, or, in more precise language, a power or aptitude enabling us to form them and to retain them until the moment of action arrives.

Volition is determined by two factors : the external circumstances by which a man is at any moment surrounded, and the various desires and thoughts excited by them in the man himself. The former are external to the man altogether,

whilst the latter are determined by his actual character at the moment; and his actual character, through an unbroken series of experiences and developments, has been determined by the potential character which was his when his life began.

In our full consciousness we act as we choose, but **our choice is usually determined by our character,** *i.e.*, by those dispositions which we inherited and followed habitually. We can control our innate desires and innate dispositions, but we cannot eradicate them. The man with the character of a lamb, or the character of a fox, the Frenchman with his French inclinations, and the Englishman with his English inclinations, are described as such because of their habitual conduct; though, as we have repeatedly explained, they can change to a considerable extent by making a *conscious* effort to do so; only under certain circumstances will the original dispositions reveal themselves.

Unconsciously we act according to the strongest motive; but consciously we can choose—not the motives, but among the motives. And although the strongest motive will have the greatest attraction for us, we can act contrary to it. We are not *compelled* to do anything. From this it follows that, **the more conscious and the greater the knowledge of self (our dispositions) and the world, the freer we are.**

The mere fact of a person having a character means that tendencies are so uniformly the same that he can be trusted under similar conditions to act always in the same way. Our character is our limitation, and if we had no limitation we should be unreliable. We have all our natural dispositions, and cannot change in one day. If we do, our friends will watch us with anxiety. Of course, the man of reason and in full consciousness can, if he chooses, go contrary to his natural dispositions; he *can* do so; though, as a rule, he is a creature of habit and indulges his strongest impulses, *i.e.*, he follows the path of least resistance. For this reason, freedom so often leads to vice, instead of being a blessing. Our friends may be able to tell us what we *would* do under certain circumstances, but they cannot tell us what we *must* do under certain circumstances.

External factors also mould the will. Man, considered as a moral agent, is dependent on the civilisation which surrounds him, on the force exerted upon him by the accumulated actions of the generations which have gone before him. The land he lives in, the nation into which he is born, its laws, its habits, its religion, fix certain limits to his action which he cannot pass any more than he can jump off his own shade. He is born a member of a special society and grows up with the beliefs, customs, and traditions with which that society endows him. He finds himself under the dominion of a moral code, of a moral standard of duty, of inrooted prejudices and practices, accepted by current opinion, to which he must give assent if he wants to remain a member. Within these limits he may act well or ill on the impulse of noble ideals or enslaving passions. He is a free agent within the limits which these surroundings determine; he is not a slave to them, for he has the power of modifying them.

Man is subject also to the influences exerted upon him in his infancy and childhood. Education and experience tend to modify the inherited dispositions; but **none of us have been free to choose our parents, or our ancestors, or our early surroundings.** Therefore, by the time we are free to determine our actions for ourselves, our habits and our character are to a large extent already formed. Now, any act which we consciously will to perform and do not perform automatically, or under pressure of physical coercion, we perform and will to perform because our nature is such that we look on the results of such an act as desirable. Every creature likes its own ways and takes to following them as a natural thing to do. Thus neither animals nor man are conscious of any restraint.

For example, the man, generous by nature, gives freely at the sight of suffering; whereas the miser, even if he can realise the sufferings of others, gratifies his tendency of saving and adding pound to pound. Both act in accordance with their own

organisation. Both follow the line along which their most active powers urge them, which is the line of least resistance.

If the passion of love is strong in us, we think we have decided to love; whereas our organisation has rendered us more liable to be stimulated by such external impressions as would arouse love. Emotions of fear, anger, pity—in fact, all the primary emotions—may be so strong as to render any balancing of the ends in view out of the question. The man agitated by jealousy and the desire for revenge considers himself free so long as he feels satisfaction from the achievement of his desires. When the storm calms down he changes his tone, and acknowledges that he was carried away by the impulse of the passion. The drunken man and the mad man, the angry man and the man in love, all think themselves free; yet when they recover they cannot always account for their actions.

Daily experience teaches us that some men are inclined to be virtuous, while others are inclined to be vicious. **We do not change anything by saying that such tendencies are the result of their innate dispositions.** Daily experience teaches us that one man wills to devote himself to art—sees, talks, and loves in art—while another wills to make money—sees, talks, and loves for business only. One man is unhappy if he cannot court women to the exclusion of all proper occupations; another sits over his books and loves learning for its own sake. These are acknowledged facts, and in stating them we are not altering nature, we are not taking away the liberty of the person; we are only explaining his disposition. Every one of these men may act differently if he chooses; but he does not choose, unless he is endowed with other strong dispositions as well, because he derives no pleasure from following other pursuits.

An act of willing is always determined by some motive. The will itself has no decision; but the motives decide the will. This does not mean, however, that the motives fight it out among themselves. We select among them, choosing to identify ourselves with one and not with another. The choice made depends upon the person choosing as well as upon the motives prompting. Of course, we do not select our own motives; they are partially determined in our characters. When there is only a single and immediate motive, we term it an **impulse.** The greater the variety of motives, the more hesitancy in action.

When there are two or more desires present, we usually choose to identify ourselves with the strongest. Thus the benevolent man may be very strongly moved to part with some money to a person who has the appearance of being in distress. Perhaps he himself at some period of his life went through some such experience. This would still further increase the impulse to relieve the suffering of his fellow-being. However, the memory of his own past sufferings may awaken simultaneously the fear of his again falling into trouble through the parting with his hard-earned money; he may also recollect that at the time he did not always receive the ready help which he now wants to extend to the suffering stranger, and that only through his saving instinct he became what he is now. After such deliberation, the saving instinct stimulated by the emotion of fear, predominates, and the silver coin is returned to the man's pocket.

The more numerous the impelling motives, the freer the individual. It is the man with the greatest choice of motives, the man whose mind is cultivated and in whom the social and ethical sentiments—sympathy, benevolence, love of justice, etc.—predominate over all selfish desires, who enjoys the greatest freedom, and whose conduct can be least determined. The less a man is educated and the lower his organisation, the fewer motives will he have, and the more easily can his actions be predicted. In most men the propensities, *i.e.*, the natural appetites and cravings, predominate over the reason. When the senses are excited, the individual feels an inclination to yield to impulse, but so long as his reason continues normal he weighs consequences, and thus may will precisely the reverse of what his desires

would have led him to effect. Many men, however, lack that power of inhibition : they readily consent to their desires.

The thoughts are often merely the expression of the propensities. For example, thoughts of love in a youth on the approach of an attractive maiden, thoughts of profit in the greedy business man on a favourable opportunity of sale or purchase, thoughts of infidelity in a jealous person on the slightest suspicious circumstance, and so forth. We imagine that we ordain the direction of these thoughts, whereas very often we are only following them. That is why so many men are mere automata and their actions can be predicted.

The will which is swayed entirely by low motives is less free than that swayed by higher motives. Consequently, when a person is blamed for having done ill, he is not blamed for not having acted without motives, but for not having been actuated by the highest motives. Moral reprobation attaches, not to the bare act, but to the balance of motives to which the act is an index. When persons pray for power to resist inferior temptations, and to follow the inspirations of the spirit—that their will may be directed towards certain actions and turned away from others—they acknowledge thereby that the will is susceptible of being influenced, and not free to act without a cause. If there existed unrestricted liberty, there would be no need for the moral education of children in restraining over-active propensities and developing weaker sentiments. It is only persons of arrested mental growth, in whom the moral sentiments never are developed, who lack sufficient choice of motives. Without such freedom of choice there can be neither vice nor virtue.

The will can be improved by education, because education improves the intellect, and intellect guides the will. SOCRATES said : "Man acts wickedly only from ignorance, even the villain who appears to act with consciousness. To choose between money, power, knowledge, or virtue depends partly on the power of the propensities, partly on education ; both, however, depend on the intelligence." Socrates shows us that he knew the intellectual powers ought to be stronger than the propensities, because the will follows the strongest inclination ; and although we may believe, before deciding, that we are quite free to choose, yet when we have chosen we often repent.

In the animal world, desire is usually followed without any other restraint than fear ; while in man it is largely, though no doubt very imperfectly, limited by self-control. Most crimes spring not from anything wrong in the original and primal desire, but from the imperfection of this higher, distinct or superadded element in our nature. Immoderate and uncontrolled desires are the root of most human crimes. Punishment aims at repressing undesirable conduct by supplying deterrent motives against it, holding that conduct is determined by the influence of motives on character. If the will were beyond the control of motives, punishment would be absolutely purposeless or simply vindictive.

The will, then, is not the determining agent, but is the result determined by the impulses and reason. The will can have no content other than that supplied by the involuntary flow of ideas and feelings, and can only have unrestricted freedom of choice between the objects thus put within its reach and desire. Thus viewed, both free will and determinism are true. We are free and we are controlled. As LAVATER said : "Man is as free as a bird in a cage ; he can live within certain limits." What some philosophers and theologians mean by free will is will without a cause. That is impossible. The only freedom of which we are conscious is freedom from compulsion in choosing among things which are presented to our choice. For choice, there is always an efficient reason, or there would be an effect without a cause ; and our freedom is the power which we have to act in accordance with the choice.

Ordinary unphilosophical persons may profess some vague belief that the will is absolutely free; but for all practical purposes they believe that conduct springs from character, and habitually act upon that belief. Our dealings with individuals are regulated by our estimate of their characters. Business would be impossible if conduct were at the mercy of an incalculable will. We address ourselves to each individual differently according to his known disposition. When we wish the covetous man to act we speak to him of his personal interest; we appeal to the benevolent man on grounds of pity and the pleasure it must give him to do good; we supply the vain and ambitious man with a motive to action by promising him great praise for the performance which we recommend to him. Indeed, the best reader of human character, in this way, is often the most successful man.

There are men who are strong-willed in some directions and weak-willed in others—weak-willed in their business or professional capacity, and tyrants in their domestic affairs; and there are strong-willed rulers in public life who have no will-power in their family circle.

Will is not only a power to act but also a power to restrain. Freedom is the power of inhibition of instinctive and non-rational acts. Man can fashion his outer and inner conscious purpose, according to the ideal set up for his guidance; he can discipline and inhibit his propensities and natural impulses, so that they shall no longer move him. It is to be understood, however, that the determining principle itself must be native to man; this he cannot give himself by his will, for it is the innermost will itself. Now, there are men who lack this innermost will-power—it is frequently lost in nervous exhaustion—and who in consequence become easily addicted to grooves of thought (obsessions), morbid habits, undue emotionality, etc. In these we have to re-educate the character, to supply fresh ideals according to their individuality; we have to teach them how to suppress undesirable thoughts and feelings, or how to direct them in other channels. This is the so-called "suggestion" treatment, which will be dealt with fully in a later chapter.

The older psychologists spoke of the will as if it were a separate entity, presiding over the mental powers and originating courses of action to the exclusion of all motives. If will were an entity, it is notably infantile in the child, imbecile in the idiot, grows in power, range and quality as the mental powers grow by education, is mature in the adult, falls sick with the body's sickness, and becomes decrepit in old age. It is not the will that directs; it is the thought that directs. Will is the concentration of the thoughts towards the desired end, the focusing of the thought-forces.

We are conscious of free will, but not of absolute free will, for we are conscious also of our limitations. No man can will to be a poet, an artist, an athlete, a Socrates or Archimedes if he does not possess the necessary capacities. **Men speak of absolute free will when they cannot even command their own ideas.** We are all haunted at times by certain ideas or memories of past experience. Had we a perfectly free will we should not allow ourselves to be troubled by our imagination day and night. We may by change of topic, association, fresh impressions, get rid of some troublesome idea; but to dismiss it at once by an effort of will is often beyond our power.

How can there be an absolute free will, when **the will is limited by other wills?** Man, as has been already pointed out, exists as a member of a community and has to adapt his will to it. We talk about liberty, but we are really slaves to our environment. Most men are satisfied in being no more than one of a herd, without independent personality.

The persons who defend loudest the illusion of an absolute free-will are often those who never strike out a line for themselves, but simply follow convention. It would seem sometimes as if not only good breeding but the highest morality consisted in following the rules of respectable society, and therefore it is that in every place the

best, most lamented, and virtuous man is he who has strictly obeyed the laws of his country and regarded the land of his birth as the best in the world. Thus it is that persons who have never had an idea beyond what their immediate surroundings have brought forth are said to have led a blameless life, and have had every virtue inscribed in gold on their pretentious tombstones. On the other hand, the exceptional men of genius, those of literary and scientific aims, who have had more brain than was ready to act in a simple reflex manner, but have not conformed to all the customs of society, have been mourned over as reprobates. This fact is often overlooked by moralists and preachers. Habit it is which compels us to the performance of a large number of our daily acts ; conventionality is what we worship in society ; we give it our highest praise, and call those virtuous who walk in its paths, so that even a commonplace man who could not get out of the routine of the manners of his little town has a monument raised to his honour.

Convention rules social life. Every one of the many professions has a peculiar character of its own, which, with rare exception, it inflicts on those who follow it. There is the shopkeeper type, the manufacturer type, the lawyer type, the medical type, the clerical type, the soldier and the sailor type. And we distinguish with ease, on the slightest intercourse, to what class a grown person belongs. It is to be seen in his look, in his tone of thought, his voice, gesture, even in his handwriting, and in everything he does.

Another class of limitations to freedom includes those which spring from our own conduct. Action creates habit, and habit influences future action. Character grows with every exercise of the mental powers, and, if it does not altogether control, it certainly affects conduct. Thus we seem to be continually setting self-created limits to our own liberty.

That there is no *absolute* free will is also shown by the **effect which circumscribed injuries and disease of the brain have** on the manifestation of character. We shall show by numerous examples in later chapters of this work that the brain, when thus abnormally affected, may change the moral qualities formerly possessed, may make the religious man profane, the honest man a thief, and the chaste a profligate —and may abolish the will-power altogether.

CHAPTER XXVI

EVOLUTION OF THE EMOTIONS AND INSTINCTIVE IMPULSES

WE shall now proceed to analyse the psychical capacities of man in detail, describe their individual action, and the effects of their combined action on human conduct (as well as their morbid activity as observed in the insane). This is a rather novel attempt and may be very imperfect; but there can be no doubt of the value of laying the foundation for such a study, not merely to the student of philosophy, but to every man whatever his vocation in life. We are generally acquainted with the leading characteristics of our friends and acquaintances, or at least have no difficulty in ascertaining them; but few people trouble to draw the necessary deductions as to the elementary motives of human behaviour. Knowing the primary dispositions and the degrees of their development in a particular individual we should be enabled to predict his conduct, a knowledge which, especially in the case of youths, must be of paramount importance for the gauging of their capacities for a particular career, for their moral education, and to ensure their future happiness.

LOVE OF LIFE

The most primary and universal desire of all organisms is the **desire to live**—the love of life—and to guard it. Nature has protected it not only by the pain which is always inflicted whenever it is endangered, but has endowed all beings with an **instinct of self-protection**; *i.e.*, an instinct to guard the body against mechanical damage or destruction, giving a tendency to avoid obstacles and dangerous objects, and an instinctive wish to preserve it even in the midst of acutest suffering.

But for this instinct we should never move out of the way of danger, never raise a hand to avert a blow, never resent an injury, never provide ourselves with the means of subsistence. If the self-preservative instinct were absent, and we were guided entirely by the preponderance of pleasure and pain, suicide would inevitably be resorted to whenever pain predominated over pleasure. If the individual had to wait till experience taught him the necessity of self-subsistence and of self-protection, experience would arrive too late to be of any use.

In insanity, especially in melancholia, the " love of life " is often lacking and its loss leads to attempts at suicide. Deeply demented persons, no more than young children, can safely be trusted to be alone; they are unable to exercise the simplest care and forethought. Idiots, too, rarely attain to the degree of intelligence that enables them to guard themselves against even obvious dangers.

THE ALIMENTARY PROPENSITY

Another primordial propensity for the preservation of the individual is the **alimentary propensity**, making the animal search for food in order to maintain life. It is this appetite for food which directs man, even when new-born, to remove the

pain of hunger and thirst, the only pain then removable by an act of his own. In man, when the nutrient materials are defective in the blood, or it is imperfectly oxygenated, the man becomes irritable or quarrelsome, showing the intimate connection between the aggressive propensity and the desire for food.

In satisfying hunger and thirst there is a great sensory enjoyment, quite apart from the relief it gives; indeed, if the impulse to eat was not made known to us by the cravings of hunger we should be unaware of it, and should believe that we ate simply because we were attracted by the taste of food. For man's tastes are not limited, like those of brutes, to foods and drinks which provide nourishment. By usage, or adoption, he has added to his dietary a vast number of substances the sole use of which is to give pleasure. The abuse of this instinct leads to gluttony and drunkenness. Often a brilliant appetite is associated with an atrocious digestion.

The insatiable craving of hunger, even when the stomach is full, is a common lunatic symptom. Some, having devoured their own ample allowance, seize all they can lay hands on, prowling about the entire day in search of food. We also find sometimes morbid desires, longings, or impulses for various substances generally regarded with loathing and disgust. Similarly the desire to drink may become a mania.

Sometimes the insane refuse to take nourishment from a great variety of motives, according to the form of insanity. A patient may be immersed in his thoughts so that the sensation of hunger is deadened; he may refuse it because he fears it is poisoned; another, because a voice told him that he must not touch it; another, because he is too great a sinner to receive God's gift. In all we have the same symptom of suppression, or perversion of the instinct, associated with very different motives.

THE COMBATIVE PROPENSITY AND THE EMOTION OF ANGER

Another universal propensity is the **combative propensity,** which is really a complex tendency, being required for aggression as well as for self-defence; and may be said to involve aggressiveness as well as resentment.

Since most animals live on other animals, *i.e.*, on moving things, every creature must be able to stop, fight, destroy, and kill in order to obtain food; that is the necessary condition of their existence, which can only be satisfied by an adequate expression of **aggressiveness.** And since every animal is thus liable to be killed and devoured by others, it must be alive to, and able to remove, the dangers by which it is surrounded, and must be capable of inflicting injury on its foes in self-defence, *i.e.*, it must possess a **propensity to resent.** This fundamental propensity is absolutely needful for the preservation of the individual. Of course, not all animals have weapons for self-defence—many of the herbivorous type, animals who live on stationary things, have not; and not being equipped for the fight, they "fear" the enemy and fly from him. Fear is another instinct, with which we shall deal presently. The aggressive instinct probably arose through the sensation of hunger, which necessitated killing for food. Never is a beast so savage as when hungry, and in a measure this is true of man. Gradually, animals also killed for the mere sake of killing. In the latter case, it is not the capture but the pursuit which is the joy; just as in our love of hunting, which is a relic of ancestral life.

Man not only must defend himself, but must resist all kinds of aggression. He must defend not only himself, but his family and property. He must possess the power to repel aggression; hence the instinct of resentment. In order to defend himself he must be also in a position to assail; he must have the power of aggressive action. He cannot always wait till he is attacked; sometimes it will be more prudent for him to go boldly at the enemy. Savage man surrounded by ferocious

animals could not wait till attacked ; he found that it was best to set out and destroy these beasts.

All living nature is in deadly conflict. Eat, or be eaten, is the law. Everywhere it is one bloody fight for existence. Man has so much modified his animal instincts that it comes to him as a shock to be told that he has a propensity to fight and kill. We must go to primitive man, when nature was still " red in tooth and claw " and the law of life was to kill or be killed. If man now fights with machine guns and tanks, instead of his nails and teeth, those enemies that would deprive him of his means of existence, it is the same primitive instinct which still actuates his mind. **Human nature has not changed.** The animal fights from impulse without any thought of the pain it inflicts. Man is often mindful of the pain he can cause ; he is artfully cruel, and " brutal " is not the word for it. The mere spectacle of a battlefield with the appalling mass of hideous suffering deliberately and ingeniously inflicted by man upon man should be sufficient to shatter all idyllic pictures of human nature.

Man lives in a beautiful world and has a mind capable of solving the profoundest mysteries of nature and assuming god-like virtues ; but the foxes and wolves of humanity manage somehow to mislead the good men and to use them for cutting each other's throats. " Peace on earth " is much spoken of, but the true spirit is shown not by what is said, but by what is done. To-day every civilised country trains its citizens in the art of killing—and in nearly all countries an apprenticeship to this art is compulsory. History is in the main a monotonously hideous record of successive wars and slaughters and the glorification of those who have successfully made war. The recent world-war has cost millions of lives to give some nations supremacy over others and to drive them, at least commercially, out of existence. It is the colossal concentration of wealth anxious for its safety, or seeking further expansion, that moves governments into conditions which bring about war, and leads to terms of peace that lay the foundation for future wars. At the outbreak of war the enemy is depicted as so vile that men believe they are fighting and sacrificing their lives for the realisation of high ideals. But, when peace is declared, are the conditions better for themselves and for the coming generation ? Has mankind become better spiritually, or richer in hate, in revengefulness, in intoleration ?

A testimony of the brute nature of man may be found in HUXLEY'S " Agnosticism " :

" I know of no study," says he, " which is so unutterably saddening as that of the evolution of humanity, as it is set forth in the annals of history. Out of the darkness of pre-historic ages, man emerges with the marks of his lowly origin upon him. He is a brute, only more intelligent than other brutes. . . . He attains a certain degree of comfort, and develops a more or less workable theory of life in such favourable situations as the plains of Mesopotamia or of Egypt, and then for thousands and thousands of years struggles with varying fortunes, attended by infinite wickedness, bloodshed, and misery, to maintain himself at this point against the greed and the ambition of his fellowmen. He makes a point of killing and otherwise prosecuting all those who first try to get him to move on, and, when he has moved a step further, foolishly confers post-mortem deification on his victims. He exactly repeats the process with all who want to move a step farther."

In individual civilised human beings this propensity manifests itself in a refined manner. Whereas primitive man resembled the animal in having to enter into combat and destroy to obtain the food necessary for life, in our own day this propensity is greatly modified and altered, because our great civil organisation has made money, by reason of its purchasing power, the chief protector of life. In course of time, civilisation has diminished the necessity of physical aggression and defence, and it has become no longer necessary for man to kill his personal enemies by way of punishment. He devised means of getting redress through the administration of

justice. Only nations envious of each other's possessions behave still like highway robbers and have not yet risen to that lofty standard. The codes of war, however, show the effort rational man makes to clothe with decency the shame of his own primitive instinct.

The public attitude towards malefactors has undergone, during the last few generations, a great alteration. Until a hundred years ago they were treated by punishments of the most savage and even barbarous character. The gallows, the axe, the stake, the wheel, the quartering-block, the rack, the thumbscrew, and the boot were employed with horrible frequency; and such retaliations of society on its depredators are now regarded with horror. Nowadays the malefactor is handed over to the courts of justice and is treated with consideration, if not with tenderness. By some he is regarded as the victim of heredity; by others as the victim of circumstances; and yet others blame the victim—society—for the depredations of those that prey upon it.

In our time this propensity is greatly modified and altered also, because of the growth of the understanding and of the social and moral tendencies amongst civilised races. Were there only propensities and intellect, many men would use their intellect for the gratification of their propensities, as animals do, but the evolution of the moral sense in human beings opposed such tendency. But if man is better able to govern his instincts or passions than are animals, it does not at all follow that these passions or instincts are more feeble. They are simply more under the control of the understanding.

The aggressive instinct and combative tendency is of use not only in the contests of the battlefield, but in the collisions of civil life, whenever our views happen to clash with, or to be opposed to, those of others; and it may display itself in the bloodless contests of the Bar and council chamber. It enables us to resent and resist, to overcome difficulties, and to find pleasure in encountering opposition. There is no quality in which men differ more than in the combative instinct. While some individuals are so devoid of it as to shrink from the most trifling opposition, there are others who are never so happy as when engaged in a vigorous contest, such as to employ to the utmost their whole powers and means, both offensive and defensive. Education and habit cannot account for it, though they may modify its activity.

The propensity of resentment is accompanied and aroused by a special emotion—that of **irascibility** or anger. This emotion is necessary in order to stimulate the physical energy and give the animal strength for the fight. The sight of its foes arouses an animal's energies to furious rage, whereby spontaneous muscular changes are developed all over the entire body and the strength of every muscle is exalted. This is a reflex mechanism of immense preservative value in the struggle for existence. Similarly, when a man is angry, the spontaneous impulse is to inflict injury on the originating cause of the emotion awakened. Sometimes he destroys innocent objects to give vent to his anger.

Anger not only increases the physical energy but gives fire and force to some of the other powers of the mind. The energy of its impulse adds itself to and reinforces that of other impulses and so helps us to overcome our difficulties. The raising of the voice in anger is an automatic manifestation akin to the roaring of the lion and intended to strike terror in the opponent. A man devoid of the pugnacious instinct would not only be incapable of anger, but would lack the push and spirit and the reserve energy which is called into play in most of us by any difficulty in our path. Anger has its justification, therefore, in the roused energies of the organism reacting against an impression hostile to its self-preservation and self-expansion. Its discharge is natural and useful when wisely guided.

The aggressive instinct can be active without anger. It gives to the character its **executive energy** and power, without which no undertaking can be successful.

The self-preservation of man and kindred animals is effected through mechanisms which transform latent energy into kinetic energy to accomplish adaptive ends. Probably it is the consciousness of strength which imparts boldness, courage, aggression ; just as a sense of weakness begets timidity.

Indulgence in feelings of anger and vindictiveness tend to make those subject thereto more and more habitually prone to outbreaks of these vices. Frequent anger, commonly called **temper,** is unfavourable to sound judgment and unbiassed opinion. Anger may be rational, but its highest pitch—rage—is brief madness ; for the main characteristic of madness is loss of self-control, and this is exactly what happens to people in a passion. The instinctive fury, the violent and destructive mania of some madmen, is no different, is only the same mental power acting in excess.

Different individuals, owing to their native temperament, bodily health, and moral education, vary remarkably in their propensity to anger, as also in the pertinacity with which they cherish this passion. In some it is sudden and transient, while in others, though perhaps less hasty, it assumes a more deep and lasting character, settling into that malignant feeling called **revenge.** Anger is sudden and impulsive resentment, in which the hostile reaction against the cause of pain is unrestrained by deliberation ; while revenge is deliberate and controlled resentment, retrospective, inflicting punishment for past injury. It was most marked in the savage, who had to avenge all wrongs offered to himself, his relations, his tribe. Revenge was a duty and a right.

Hate often precedes and succeeds anger. The object of anger is particularly apt to be the object of hate. What anger accomplishes by a volcanic outburst, hate accomplishes in a slower, but surer and subtler way.

Envy is hate combined with a certain very compound concept. It is aroused by the superiority of some individual to ourselves, which we regard as a sort of a hindrance or injury, against which consequently we feel resentment. If we make attempts to bring down its object to a lower level, to compass the ill of its victim, this is **malice.**

Jealousy, too, is a very complex compound of love, fear, suspicion, and often hate. Like hate, it depresses vitality and keeps the body in a peculiar explosive condition, so that violent paroxysms of anger suddenly burst forth at a touch. Jealousy is a species of envy, but the latter invariably is attached to real or supposed superiority, while jealousy attaches to equality, or even lower, and has therefore a wider signification.

Those in whom the instinct of resentment is very active generally manifest also great force of character, executiveness, tenacity of purpose, and energy of mind, which enables them to overcome whatever obstacles oppose their progress. If they have large self-esteem as well, they may show sternness and severity of character, great indignation when displeased, and give their commands in an impressive and fear-inspiring manner. Such a resentful disposition in a person of nervous temperament leads to peevishness, fretfulness, and irritability. The combative instinct in a person of small intellect leads to easy provocation, ready quarrelling, and the kindling of strife. When combined with a dominant acquiring instinct, the person may " quarrel for a penny." Combativeness with little caution leads to foolhardiness, and when combined with large intellect and the gift of language, such a person will be fond of debate, and will prefer to argue on the opposite side of the question.

People in whom the combative instinct is defective dislike quarrelling and will avoid it, surrendering much for the sake of peace ; they have no liking for severity of any kind, and would use physical force only as a matter of necessity ; they threaten more than they execute, and show anger to little effect. If they are persons with large sympathy, they secure their wishes more by persuasion than by threats, and cannot bear to see suffering. If they are very cautious and of a

nervous temperament, they are likely to be timid, irresolute, and may see lions where there are none and make mountains out of molehills.

In this manner the effects of combinations of the combative instinct with other dispositions might be described, but these examples will suffice to demonstrate the importance of ascertaining the primary dispositions of a person, and to show that one can predict from their combination the " likely " conduct under given circumstances. The systematic study of ethology would thus prove eminently practical and beneficial to humanity, a goal that pure psychology could never reach.

Irritability of temper from slight causes, a tendency to take offence easily, noisy arguing, unpremeditated violence and, to a lesser extent, designed violence, are common symptoms in several forms of insanity. Often there is violent anger against everybody and everything. Or its subject will exhibit a general moroseness of character, or a malignant hatred toward, and a disposition to inflict cruelty, and even death, upon, particular persons, especially such as are most near and dear to him when in a rational state of mind. Some insane patients are impulsively destructive to material objects only, such as glass or furniture, and are quite harmless in other ways ; while others will make assaults on persons as well, with or without intent to kill. These are the really dangerous lunatics ; they form only a small minority, and even in them such outbursts of passion can be avoided by proper care and treatment.

Slight irritability from exaggerated sensibility may occur in *neurasthenia*. One of the characteristics of *hysteria* is instability of temper. Mere argumentativeness, rarely anger, is one of the symptoms of *dementia præcox*. In the early stage of *mania* patients become irritated on the slightest provocation, but their irascibility does not last. The *general paralytic*, too, may be easily roused to anger, and is also more or less easily calmed, at least at the onset of his disease. Noisy, abusive, violent temper is seen in *acute alcoholism ;* unreasonable irritability, unprovoked anger rising to blind impulsive passion is seen in *chronic alcoholism*. Peevish disposition, bad temper, impulsiveness giving rise to dangerous acts, occur in *epileptic insanity*. The highest degree of irascibility is seen in *acute mania*, where we get excessive anger, violent language and conduct, sometimes lasting for days without any interval. Explosions of violence occur when least expected, and may lead to attacks on any person who happens to be present. In certain *delirious states* and *melancholia agitata* the patient raves and destroys, but his activity is conditioned by painful states of feeling and frightful hallucinations, and is analogous to the acts of a sane person enduring torture.

PROPENSITY TO TAKE FLIGHT AND THE EMOTION OF FEAR

Defenceless animals and animals recognising the superiority of the enemy instinctively take to flight. The struggle for existence of the different species of animals has exposed them, especially the weak, to continual risk. The consciousness of past dangers has caused them to fear the enemy and, when possible, to run away from him. The **emotion of fear** has its object in nature to make the animal shrink from danger. This must often happen automatically, otherwise it proves useless. There is often no time for reflection. Were there no emotion of fear experienced, there would be no apprehension of danger. Fear is perhaps more essential to the human species than to the brute creatures, for we do not possess the same facility of avoiding danger by rapid flight, or of concealing ourselves by what may be called instinctive strategems.

Certain things arouse fear in young animals before they have learned by experience what things are signs of danger—as loud noises, rapid approach, strange or large things. Generally speaking, the unfamiliar arouses the fear instinct, for what is unfamiliar may be a menace to life. This is especially important in weak and defenceless animals, such as hares and rabbits, whose only refuge and safety is

in running. Animals which must receive actual injury before experiencing pain are clearly inferior to those which experience emotion-pain before the injury is actually received.

The effect of fear upon the system proves its uncontrollable influence. The sudden stopping of the heart-beat and respiration, and the paralysis of movement in which it sometimes finds expression, are due to the impulse to concealment; the hurried respiration and pulse, and the frantic bodily efforts, by which it is more commonly expressed, are due to the impulse of flight.

P. CHALMERS MITCHELL, Secretary to the Zoological Society of London, in his work on "The Childhood of Animals" says that he tried animals with snakes; and all the animals on which a snake would feed showed no signs of fear. There was no trace of any transmission from ancestors of inborn fear or recognition of such a universal natural enemy as the snake. But this is no proof that fear is not innate. A child will approach a fire and walk across a street without compunction. Fear is innate, but not fear of fire, or fear of street traffic. A child may play with a lion; that does not say that fear may not be very active in it.

BENJAMIN KIDD ("The Science of Power," London, 1918) similarly holds that fear arises entirely as the result of social heredity imposed on the young of each generation by training and example and nearly always under conditions of a strong emotion. Yes! but the element is there in different degree. Some animals of the same species and brood are more afraid than others. A solitary cow having her first calf may attack a passing stranger, surely not from social heredity.

Kidd says when once the emotion of fear has been set into activity the animal could not be tamed. That shows the apparatus is there, only not manifested until aroused by experience. So human emotions may remain more or less latent, just like the primary intellectual capacities remain latent until stimulated by training. If Kidd were right, the taming of animals would be an easy task. We need only take the young as soon as they leave the nest or their mother's breast, and since they will be free from fear, we can breed from them when they grow up, and thus create a species—say of rabbits or of hares—free from fear.

Fear sounds the trumpet-note of danger. With little fear, there is frequently little caution, and the danger is not seen until escape is impossible. The objects of fear vary according to the individual constitution. Each man has his special fears, as his fear is combined with other sentiments; thus there is fear of loss of money, power, reputation, and many other things besides life. The tendency to fear and to employ the intellect to take precaution has been very unequally developed in the different individuals of our species. We find a more profuse manifestation of the feeling of fear in natures more intensely and variously sensitive than the average. Those who feel strongly the ill consequences of a false step are moved to avoid it; they may be afraid or they may not; fear is not necessary to active precaution. Normally it produces prudence and circumspection; when deficient it causes recklessness and carelessness; in excess it causes indecision, cowardice, and, in some, such a depression of spirits, that with the slightest misfortune they fall into despair and think life no longer worth living.

Fear incites us to avoid, or flee from, dangers. When escape, however, is impracticable, the emotion may change and the individual will often be driven to the most fierce and desperate resistance; thus even the greatest cowards have sometimes acquired the fame of heroes. We cannot feel fear and anger at the same time; but anger may follow fear.

Courage frequently means blindness to danger, a lack of imagination to realise the horrors of a distant catastrophe. A man who is mentally alert and well-informed, and therefore able to gauge pretty accurately dangers he is called upon to face, is not likely to distinguish himself for physical courage. On the other hand, the naturally timid, if they possess the higher faculties, may be stimulated by duty,

honour, pride, so that in many instances they become bold and successful warriors. The most delicate and effeminate in body, through the ascendant influence of their moral nature, have faced dangers and borne sufferings under which naturally stouter hearts and firmer nerves quailed. Fear will oftentimes spring rather from mistaken judgment than from any absolute deficiency of courage. Familiarity with any particular danger, according to a law of the animal constitution, serves to diminish our dread of it, although it may not necessarily embolden us in respect to others of a different character.

Fear is not only an essential instinctive feeling for the protection of the individual, but it is also a powerful agent in the preservation of social order. For there is no doubt that the apprehension of punishment materially influences man's conduct.

A child with little moral sense but large fear may, from dread of punishment, avoid telling falsehoods, until with years the habit of speaking the truth has become a second nature. Fear is also the basis of morality among many uncultured people. They do not steal because they fear the gaol, and they do not murder because they are afraid of the gallows. It is already a moral advance when a man has large domestic affections and will not steal, not because he fears gaol, but because it would give pain to his mother, wife, or sisters. We all behave ourselves, in a measure, for "fear" of public opinion.

Circumspection and foresight depend on the emotion of fear, but are essentially intellectual manifestations, compound and not fundamental therefore. **Circumspection** is calm, sustained, intelligent effort to accomplish a purpose. **Foresight** is an intelligent perception of the probable effects of present circumstances, and a conception of coming causes and their resultant consequences. Circumspection is one of the most comprehensive powers of the mind, and its co-operation is needful in all states and conditions of life. Instead of being a simple, unresolvable power, it is very complex, and springs from several intellectual faculties and emotions, of which the emotion of fear is but one. Every circumspect act is the result of the judgment, or the judgment is the approximate cause, though fear may be the remote or inciting cause, which is the only part it can play in circumspection, and it is not in all cases the principal cause. Circumspect animals keep a sharp look-out for danger, and therein we have the origin of foresight. The **cautious** and **prudent** are those whose fears are far-sighted. Instinctive prudence is very different from simple reflective prudence. **Dread** is fear of a future event.

Fear, in its most aggravated degree, acquires the name of **terror.** That particular condition which it has been imagined certain animals have the power to produce in certain others, termed fascination, is not unusually ascribed to the agency of terror, which paralysing, as is thought, all voluntary muscular action in the victim, renders him an easy prey to his destroyer. Terror is paralysing; the individual is "rooted to the spot," and has the appearance of death, an effect which in some animals is protective.

Horror is a painful detestation, more or less mingled with fear, of particular objects, which usually neither threaten nor, in fact, cause the slightest apprehension of bodily injury.

Grief is a complex emotional state, consisting of love and fear, with an idea. A mother sees her child dying, and her grief is intense; but if we could destroy her love for the child her grief would cease at once, though she might feel sympathy. Grief, then, in this case, is love combined with the fear of death. Grief, like fear and all depressing emotions, causes a rise of blood-pressure. A profuse shedding of tears relieves the blood-pressure and frequently also the mental state; that a good fit of crying eases the grief is a common observation.

Despair is the name by which we express the most aggravated degree of mental depression. Under this dreadful feeling, no ray of hope, no sunbeam of joy, breaks in upon the gloom. Fear normally stimulates effort, in normal despair there is absolute inertness. One may fear or be frightened a little, but there is no littleness in despair. Desperation is the feeling of the inevitable.

It is not misfortune that drives people to suicide, but a constitutional disposition to look at the dark side of things and to be apprehensive, often without cause or with insufficient cause; for there are millions of people who bear with cheerfulness disappointment, loss of wealth, loss of husband, wife, children, friends, of health, character, or social position; they do not dream of suicide.

Fear is accompanied by a more or less sudden closing down of the blood-vessels of the body. We soon recover from the effect when the cause is gone. But in grief a steady constriction is placed on the vessels, and the vital tone, though less sharply, is more permanently lowered. Dislike, jealousy, and hate are in their physiology closely analogous to fear and grief. The bodily powers which they restrain are still present, though kept in repression, and therefore liable to explosive manifestation.

A man cannot be angry without having the object of his anger—whether real or imaginary—in his mind and wishing to oppose or destroy it; he cannot be afraid without thinking of the object of his fear and wishing to escape it. But in joy and anxiety he experiences only a passive consciousness of his vascular condition.

As regards the *combination* of other faculties with the emotion of fear, we may note that the disposition to fear in an intellectual person gives rise to forethought, carefulness, and prudence. When combined with an active combative instinct such persons may be slow in commencing, yet, once interested, they push on with spirit, and will combine discretion with valour, prudence with determination. The fear instinct in a person of nervous temperament makes them easily anxious and discouraged. The fear instinct with little combativeness, self-esteem, and hope, renders persons timid, destitute of energy; they rarely venture and are likely to worry over misfortunes.

Persons with little fear may lack care and prudence, and if combative they may drive forward in a furious, reckless manner. When fear is combined with the acquiring instinct a person may take care of property, but is likely to be imprudent in other respects. And if his acquiring instinct is small, he may keep money loosely.

As regards fear and *insanity*, morbid fears of a special kind are common in *neurasthenia* and *hysteria*. Fear as to health and apprehension of disease is the main condition of *hypochondriasis*. Terrifying hallucinations occur in *alcoholic insanity*. Unreasonable excessive apprehension and vague feelings of anxiety are common in *melancholics*; their whole life is tinctured with sadness, anxiety casts a gloom over all their thoughts and actions. They can find no pleasure in anything, and feel as if their body were fixed to the place where they are; or else they may be so agitated as to run about in violent despair. Their delusions, if any, are not the cause of their disorder, but are mere efforts on their part to explain their misery. On the other hand, fear and anxiety, caution and prudence, are often diminished or lost in insanity and lead to actions resulting in the ruin of the patient and his family.

PROPENSITY TO CONCEALMENT AND FEELING OF SUSPICION

Animals had to protect themselves against their numerous enemies to avoid destruction, and developed a **tendency to concealment,** which was also found useful in approaching their own prey, and a **feeling of suspicion.** Suspicion is a protective propensity and hence a necessary quality. To hide is as instinctive as to run away. Hiding is protective because it falsely suggests to the adversary that there is nothing

for him to attack. It is, then, the beginning of deceit. An animal cannot always protect itself by open force, and it must make up in **cunning** what it lacks in strength and courage. Hence it conceals itself or its intentions. Thus wild animals make use of innumerable arts for procuring food and escaping from their enemies. The hunter studies the habits of the animals he pursues, that he may lay his snares and shape his proceedings accordingly; so it is in human life. Those who are secretive and close in what regards themselves are vigilant in watching others with intent to discover, if they can, their sentiments and purposes. Cunning can outwit muscular strength and tends to develop the intellect in one particular direction.

A person under the dominion of this propensity can conceal his own thoughts successfully and take a great interest in the concealed thoughts of others. This is the Sherlock Holmes type. Even small things, slight omissions, and the smallest peculiarities of man have their lessons for him, raise a suspicion, and are traced to their true source. To the guileless man such things generally go unnoticed. The mind of the secretive man has a familiarity with all underground channels of thought. He knows by instinct what the next move of the rogue is likely to be and can trip him up. Hence the saying, "Set a thief to catch a thief." The criminal who is deceitful prefers forgery and fraud to theft, and will use poison rather than direct assault to kill a person.

Some men are by nature secretive, prone to duplicity, hypocrisy, and cunning, while others are frank and open. A certain endowment of this power is essential. People who give utterance to every thought and feeling which arises in their minds, and confide their private affairs in a reckless fashion, appear to be both foolish and a nuisance. A man but moderately endowed with this power may nevertheless keep his own counsel, if he is possessed of caution and good judgment. Such a man may be frank and overflowing with his friends, but he will save himself with strangers by his caution. The man who has a fair share of this power trusts little without good cause, takes little for granted, and consequently is seldom hoodwinked; whereas the frank man is liable to think others equally frank and truthful and is easily deceived.

A suspicious person, as, for instance, a jealous man, may reason quite correctly, but he will misinterpret actual occurrences in accordance with the state of his feeling. Ill-founded suspicion is common in insanity. In such cases it is not the reasoning that is wrong, but the premisses that are ill-founded, actual occurrences being misinterpreted owing to the perverted emotional state. If the premisses are conceded, then is the conclusion perfectly correct. When the disorder has lasted some time, and the false ideas are habitually dwelt upon, they become realities to the consciousness of the individual. Such suspicious patients think that the people in the street look at them strangely; they may fancy that the newspapers write about them, that policemen or supposed enemies are following them; that there is a plot or conspiracy to rob, ruin, and destroy them.

Suspicion renders people **secretive**; they penetrate the thoughts of others and try to conceal their own. They are rarely indiscreet, and are generally able to restrain the outward manifestation of their feelings. Secretiveness with little conscientiousness gives a cunning, deceitful disposition. A secretive, but social, person may sometimes communicate his feelings freely to his nearest friends, yet will seldom do so and will exercise more attachment than he expresses. Secretiveness in a person very acquisitive and not conscientious leads to the practice of tricks of trade.

With little suspicion, a person is generally frank, candid, cordial in disposition and intercourse with men, has few secrets of his own which he wishes to keep, and cares little about learning the secrets of others. He may disclose his faults as freely

as his virtues. Combined with large caution, he may manifest great care and deliberation in laying plans, but be imprudent in the manner of execution. A person with large social feeling and little disposition to suspicion will enter readily into conversation with strangers.

Ill-founded suspicion of being despised or distrusted, or a marked person, is peculiar to *paranoia ;* innocent looks or remarks are interpreted as having some deep meaning and may lead to attacks on strangers. *Melancholics* sometimes have delusions of persecution, attributing their misery to the influence of others ; but they never react against their persecutors, but accept their supposed injuries as rightly deserved. Persecutory delusions, referring chiefly to mysterious objects and arising from hallucinations, are common to *acute alcoholism. Chronic alcoholics* are very distrustful, especially of the fidelity of the wife or husband. In *senile dementia* the delusions of suspicion and persecution are usually directed against the patient's own family, resulting sometimes in strange wills being made to the disadvantage of the wife, son, or daughter.

On the other hand, there is sometimes too much frankness in persons of disordered mind. In the early stage of *mania,* patients unburden their innermost thoughts to chance acquaintances, and so do the *general paralytics* to undesirable companions. This association and intimacy with persons of inferior station in life may be the first symptom which draws the attention of their friends to their mental state.

THE PROPENSITY TO ACQUIRE AND HOARD

The propensity to acquire and hoard is another primary propensity. Some animals found it useful not to have to hunt continuously for food, which may prove scarce at certain periods, and began to store up things for future use. Thus developed the **hoarding propensity** and love of possession, a tendency to lay up provisions for the future. Man not only stores up provisions for winter, but he acquires property of every sort and kind for all his life and for his posterity. The tendency to acquire varies in different people ; the *ability* to do so depends on the intellect and other requisite qualities. The hoarding instinct is one of the strongest and most general impulses of our nature, and, in fact, is the origin of wealth, by the tendency which it produces to acquire for the mere pleasure of possessing. For the sake of gratifying his desire to acquire, one saves where others spend ; one man is diligent, and another speculates, to get rich quickly.

In the child this propensity shows itself most naturally. The child will seize everything and appropriate what does not belong to it. Idiots and imbeciles will steal, the intellect being too deficient to check the animal instinct. Love of possession is a natural disposition implanted in the human organisation, and dishonesty is only the result of the absence of controlling motives.

The hoarding propensity originated in the practice of accumulating, in times of plenty, a store of food that should serve for sustenance in time of scarcity ; and its obvious advantages soon caused the transfer of the desire and the practice to other things than food ; until, in the course of ages, it culminated in the practice of accumulating money, the symbol and potentiality of acquiring most things that are regarded as desirable. Having started as a means to the further end of security against future want, it has now, by the process of anticipation of future motive, become an end in itself ; and we have the familiar spectacle of men who have already accumulated money in excess of any possible need, still continuing the accumulation for the mere sake of accumulating. From food and money the practice has overflowed, by an easy process of transference, to other things, some useful, many useless, and we now see people accumulating postage stamps and all kinds of queer things, merely to satisfy the instinct of accumulation.

The love of wealth, as distinct from the desire for objects of immediate gratification,

in which it undoubtedly takes its rise, is an object of future gratification, and therefore requires foresight. First we provide for our own wants, next for those connected with us, and ultimately wealth is amassed without any regard whatever for its future use. The amassing itself becomes a pleasure for its own sake. Its ill effects are a grasping and covetous disposition ; its good effects, the stimulation of frugality and industry. When the desire for the accumulation of money has become a man's ruling principle, and he exhibits it on all occasions, he is called covetous or avaricious.

For the crowd, the idea of happiness never extends beyond a limited circle of immediate and tangible satisfactions which can be bought with money. In order to succeed, all means are justified, and success is the sole measure of the value of actions. Success under its most brutal form, which is monetary success, has almost become the exclusive object of universal endeavour. The collective ideal is the same as the individual ideal—to get rich as soon as possible, and by every available means. As in private life, admiration and respect are accorded to those who have succeeded financially. The desire to become rich destroys the capacity for happiness when the riches are obtained ; but there continues a ceaseless activity. The governing classes are no longer the higher classes, and what remains of the old aristocracy has but little concern in maintaining its intellectual supremacy, or in constituting itself as a social force and setting an effective example. The only effective aristocracy that survives is that of money, and it cares for nothing save augmenting its wealth or spending it without intelligence. The highest class to-day is a mere plutocracy.

A man may be a **thief** without love of property, and he may be moral and yet grasping. There are many rogues who are not very acquisitive and who readily part with what they have stolen ; that is to say, they are dishonest but not selfish ; and there are many avaricious men who are sternly honest. In moderation, not out of proportion to the other impulses, we see persons not grasping, but with a conservative and economical tendency towards property, and a disposition to take good care of everything they possess. They waste nothing, but they are not necessarily selfish or very eager in the pursuit of wealth.

Cupidity and **greed** are caused by general selfishness combined with this propensity. **Penuriousness** is caused by this tendency being active in a timid or weak man. The pleasure of **avarice** consists in accumulating and hoarding up treasures ; in computing and gloating over them ; in a feeling of the power which they bestow ; and likewise in the consciousness of the possession of the means, though there be no disposition to employ them for the purpose of enjoyment. **Envy** is directed toward those who already, or at least as we conceive, enjoy something more and better, either internal and external gifts, than belongs to ourselves.

When the acquiring propensity dominates, there is a disposition to turn everything to good account, which stimulates to the acquisition of wealth. When combined with cautiousness, such a person cannot endure to see waste ; he will sometimes deliberate so long as to miss good opportunities ; he will save rather than speculate. The acquisitive person with a hopeful disposition and small caution is likely to enter into speculative enterprises. The acquiring propensity combined with good observing faculties makes a man a good judge of the value of property ; and, in a man of large intellectual powers, makes him prefer a livelihood by intellectual pursuits rather than business.

A person with only poor acquisitive propensity desires money more as a means than as an end. He may be industrious but lack economy, and is likely to show disinterestedness in pecuniary matters. The person with little acquisitiveness and æsthetic sensibility and desirous of approbation likes to buy beautiful things and to show them. The person with little acquisitiveness and a hopeful disposition may spend money in anticipation of future events and is apt to run into debt. A person

not acquisitive and very cautious may still acquire property; but it is as a safeguard against future needs, and he cares little for it as property.

Genuine **kleptomania** is probably due to an excess or perversion of this propensity, where an individual, apparently sane in other respects, will steal anything he can lay hands on. It occurs in persons in whom there is a strong desire to take possession of things quite irrespective of their value, disregarding risks of detection and the consequences of exposure; and it is accompanied by a feeling of restlessness and anxiety when the impulse arises and a pleasurable feeling of relief and satisfaction on the execution of it. As in the child, it is the appropriation which gives the satisfaction, and not the enjoyment of the article taken; so that the objects appropriated are usually insignificant, considering the position and wealth of the patient. In consequence the stolen goods are not parted with for gain, are not valued or desired, but are quite thrown away, or accumulated uselessly, or they are forgotten.

Kleptomania occurs in the mental disorder which sometimes accompanies pregnancy, in the clouded consciousness of *hysteria*, and sometimes in the semi-conscious state following an *epileptic fit*. Weak-minded persons are prone to commit petty acts of larceny, and head-injury may also be a cause.

In the early stage of *mania* the patient sometimes steals whatever he can lay hands on, but the articles stolen are often thrown away as soon as they are in his possession, and he steals almost openly. *General paralytics*, in the early stage of their disease, not infrequently steal without reflection, though sometimes with ingenuity, as a rule any article that takes their fancy. They also commit frauds of every kind, generally neglecting ordinary precautions. In the latter stages of the disease these patients again steal, but this time under the delusion that everything they see belongs to them. They then appropriate all sorts of articles, hoard and conceal them, and immediately afterwards lose all recollection of them. In *senile dementia*, the hoarding propensity appears pure and simple, such patients filling their pockets or any available receptacle with anything they can lay their hands on, regardless of value, even with mere dirt.

Among other perverted manifestations of the hoarding propensity in insanity we have, on the one hand, the patient who fears loss of property and destitution, or thinks he is already ruined; on the other, the parsimonious man who suddenly launches out into endless extravagance, giving orders for motor-cars, jewellery, and other luxuries, which he has often not the means to pay for, or else makes imprudent investments, or is given to impracticable business ventures.

THE SEXUAL PROPENSITY

We have dealt so far with the dispositions implanted by nature for the *preservation of the individual*. We have now to deal with the propensities intended for the *preservation of the species*. The most primitive of these is the **sexual propensity,** or the tendency to propagation.

To each individual, life is not a gift but a trust, to be employed in transmitting life to a new generation; and, this purpose effected, the *raison d'être* of the individual is at an end. This is very clearly indicated in the lives of many of the lower animals, in which reproduction is followed at once by death. In man this propensity has reached great refinement, and given rise to the tender **emotion of love,** besides inspiring men to immortal productions in painting, sculpture, poetry, music, literature, and the drama.

In insanity it is often exalted to an extraordinary degree, leading to the most lascivious conduct—*nymphomania* in women and *satyriasis* in men. Indecent manifestations occur in *general paralysis;* regard for decorum and the amenities of society is often lost in the mental disorder of the *climacterium*. Over-excitation is also common in the early stage of *mania*. The erotic tendencies are often revived

in *senile dementia*, which makes the patients easy victims to designing women and often causes them to be so misguided as to fall in love with very young girls.

PARENTAL LOVE

The **love of offspring**—parental love—is an instinct inherent alike in animal and in human nature, and is one of the instincts necessary for the protection of the race.

It is necessary that the young animal shall not, during the first period of its active life, be dependent altogether upon its own efforts, for its highly generalised instincts would hardly suffice to maintain it alive unaided. Rather it must enjoy a period of sheltered life, during which it may acquire, through experience, such specialisations of its innate mental structure as are necessary for independent existence. This period of protected immaturity Nature provides by developing in the species the parental instinct, which leads the adults of each generation to feed, protect, and shelter their young, while these add to their highly general innate knowledge a sufficient store of acquired knowledge.

Among ourselves the credit of right conduct is freely and warmly allowed to the mother who works for her children, who denies herself many an innocent pleasure in order that she may feed and clothe and properly train her little family. But in almost all animals that attend to their young the self-same devotion may be found ; and it will be observed that, even in those who in all other situations are very timid, any attempt to remove the young from the protecting parent, or in any way to hurt them, provokes a fierce and desperate display of all their combative resources. Take, for example, BREHM'S observation of the monkey-mother.

"When the monkey suckling is unable to do anything for itself, the mother is all the more gentle and tender with it. She occupies herself with it unceasingly, sometimes licking it, sometimes running after it or embracing it, looking at it as though revelling in the sight of it ; then she lays it against her breast and rocks it to sleep. When the little monkey grows bigger the mother grants a little freedom, but she never loses sight of him ; she follows his every step and does not permit him to do everything he likes. She washes him in the brooks and smoothes his fur with loving care. At the least danger she rushes to him with a cry, warning him to take refuge in her arms. Any disobedience is punished with pinches or cuffs, but this seldom happens, for the monkey does not do what its mother objects to. The death of the young one is, in many cases, followed by that of the mother from grief. After a fight, monkeys generally leave their wounded on the field ; the mothers only defend their young against every enemy, however formidable. At first the mother tries to escape with the young ones, but, if she fails, she emits a loud cry of pain and remains still, in a threatening attitude, with wide-open eyes, gnashing her teeth and menacing the enemy with outstretched arms."

Whether we call this instinct or affection, it is necessary for the maintenance of the species that things should be so. Still, desertion of infants and young children is not uncommon in human beings. In insanity the love for the child often turns to hate.

LOVE OF HOME

The reminiscences of infancy and early youth are the source of an attachment to the place and surroundings in which we live, giving rise to a **love of home,** which further extended gives a love of country—a **patriotic attachment.**

Patriotism is one of the most lauded virtues, but it is often wilfully perverted by rulers by inculcating in the thoughtless masses an irrational dislike to foreigners, and an idea that their own countrymen are necessarily the most superior in the

world. Patriotism is not fostered by them solely as a feeling which leads to self-denial and disinterested effort for the whole nation, but as a curious mixture of a desire to overcome other nations, an irrational contempt for their customs, and a swaggering self-complacent idea of superiority. Sound patriotism—that is, love of the beauty of one's native country and its achievements in science, literature and the arts—is to be recommended and does not exclude the higher ideal—a love of humanity. The spurious patriotism promulgated by ambitious rulers and interested self-seeking classes seeks to foster dissension with other nations, and has only one purpose: to make obedient soldiers when the government of the country chooses to make war. If the well-being of one's country is threatened from without, it is an absolute duty to sacrifice oneself, but too often the interests of the rulers or ruling class are confounded with the State.

Some persons have this feeling of attachment to home so well developed that they do not like leaving their native place and suffer from "home-sickness" when they do go away. The opposite are those persons who have no interest in home, take little pains with it, and easily change to where their interest or business leads them.

SOCIAL ATTACHMENT

Animals having to fight to obtain food, and others having to defend themselves against attack, must have found it of advantage to keep together in groups, for aggression in a herd was surer of success than singly, and so was protection. Other animals found that by keeping in flocks mutual alarm could be given more easily; also that enterprises, such as migration in the case of birds, afforded greater protection when undertaken in a greater number. Similarly primitive man, unprotected against the forces of nature and at the mercy of every foe, his instinct directed him to cultivate the society of his fellows. He found that living in numbers and forming societies rendered him more powerful and enabled him to give effect to the advantage of his superior intelligence. Every conquest over animals and over natural conditions has been due to specialisation of employment; and specialisation is not possible except in social life. When life is in solitude, or in pairs, everything that is necessary for preservation and survival must be done by each individual or each pair. If every man had to collect his own food, protect his own family, build his own house, make his own clothes, and make his own furniture and utensils, innumerable works of utility would remain undone, and art, science, law, medicine, etc., would never have come into existence.

Grouping among men was all the more necessary because of the long protection needed by their offspring. The long association before children became independent gave rise to an attachment between child and child, and child and parent, between brother and sister, friend and friend, and so on, thus forming the foundation of social life. Again, family life awakened in primitive man feelings of love and tenderness for those who excited in him no fear or rivalry. Gradually these sympathies widened till they embraced the tribe and ultimately the whole human race.

Social attachment necessitates renunciation. To share the advantages, the protection, of the community, we must abandon the freedom allowable to a solitary man and restrain ourselves in every direction. Those who lack this sentiment are likely to sacrifice friends if their interests should suffer.

There is a great difference among individuals in regard to the strength of the social feeling. Some men have many acquaintances, but no friends; while others remain attached to certain individuals during every change of circumstance, and do not readily enlarge the circle of their intimates. When this feeling is strong in a person, delight is felt in friendship and attachment. Those in whom the feeling is

weak care little for friends; out of sight, out of mind, is their practice. The possession of this instinct, even in great strength, does not necessarily imply sociability of temperament. Many a man in London leads a most solitary, unsociable life, who yet would find it hard to live far away from the thronged city. Such men are unsociable but gregarious; and they illustrate the fact that sociability, although it has the gregarious instinct as its foundation, is a more complex, more highly developed tendency. However safe they may know themselves to be, most men find it difficult to sleep in an empty house, and would be distressed by prolonged absolute solitude. Even habit cannot do much in this respect. We like privacy, we do not like chatting all the time; but we feel more comfortable in the knowledge there is another person somewhere on the premises.

To a certain extent the foundation of all morality is domestic; for even now, parental and conjugal sympathies, as they were the first to appear, so are they still the most fundamental. When a man has run his mortal race, if for his epitaph we may truly write that he was an affectionate son, a kind husband, and a tender father, we imply a character of fundamental goodness from which other moral qualities may be inferred. If we can add that he was a true friend and a devoted citizen, in that collection of parental, conjugal, and social sympathies we describe the full measure of ordinary practical morality.

Living in crowds diminished the personal responsibility and increased the suggestibility. Doing less for themselves, the keenness of the senses and the excellence of the reason in certain directions diminished, and belief in the collective observation and judgment was substituted. The masses cannot all take part in affairs of the State and diplomacy, and must accept what the rulers choose to tell them through the Press. The information can be so restricted and so arranged as to create certain beliefs and prejudices among the masses, and thus moulding public opinion at the expense of independent judgment.

In certain forms of insanity the social feelings become perverted, persons forming attachments to undesirables and outcasts, as in the early stage of *mania* and *general paralysis;* or they become almost extinguished, solitude being preferred to company, as in *melancholia,* when even the death of a dear one may leave the patient indifferent. The melancholic shuns society because social intercourse gives him pain, while the *paranoiac* shuns it from mere distrust. The patient suffering from *dementia præcox* avoids relatives and associates, being engrossed with himself. Often the commencement of insanity is marked by the lapse of natural affection, the dislike of friends and relations becoming pronounced and increased to actual hostility. Sometimes the mental disorder shows itself in patients loving without measure those whom they soon hate without reason. Long continued mental disorder is especially distinguished by an unsociableness, which often prevents patients from speaking to their companions. It is no pleasure to them to be associated with their fellow-creatures. Many of them do not play games, and they cannot combine for any purpose.

SELF-REGARDING SENTIMENTS

From the social attachment there arose the **desire to please,** to earn the approval of those who are dear to us and with whom we live in companionship. A man must so order his conduct as to gain the approval and good opinion of those with whom he consorts, and the desire of gaining and retaining this good opinion is one of the strongest of the motives by which his conduct is prompted and regulated. Such is the origin of **love of praise** and dread of blame, which are necessary elements in social life and give rise to the **desire to excel**—that is, to ambition. Duties are enjoined on the young by parents and elders; and certain acts are forbidden or punished, others are applauded or rewarded. The public opinion of society carries on the process.

The desire to obtain the approval of others for our conduct, and to avoid their disapproval, is a very powerful and pervading motive to conduct. What will people think ? is a question constantly on the tongues of some, and constantly in the minds of all.

In every community, conformity, not only of conduct, but of opinion, of each, with the conduct and opinion of the rest, is regarded with approval ; and conduct and opinion that do not conform to the common standard meet with strong reprobation, and sometimes with vigorous suppression. Hence we find strongly implanted among the instincts of every member of the community the **desire to conform,** to do as others do, to fall in with the prevailing mode of action. The good citizen is he who is satisfied with existing conditions and is obedient to authority.

Conformity is the imitation of the example of others ; but there is a clear distinction between conformity and imitation. The child's action in learning to write is imitative, but it is not conforming. Conforming action is necessarily imitative, but imitative action is not necessarily conforming. Fashion is that conduct, whether changeable or continuous, to which all conform at the same time. Thus, a fashion, if it endures, becomes a custom ; and a custom, so long as it endures, is a fashion ; but, while continuity is the essence of custom, fashion is independent of continuity or change.

Conformity to the customs of the community is usually regarded as morality ; but true morality is to do what we believe to be right, merely because it is right. We should disapprove of ourselves if we acted otherwise, and our own disapproval is more than we can bear ; so we do what we believe to be right, even though, in so doing, we incur the disapproval of others. Many people do not act on the motive of securing their own approval, but accept the conventional morality they find prevalent.

Love of approbation causes men in their social intercourse to be courteous, conciliatory and polite. Life is thus made more pleasant, and the general sum of happiness is increased. If all men spoke exactly what they thought, without being restrained by the fear to offend, or the desire to please, what a world we would have !

Love of approbation gives rise to **display** ; thus refinement is promoted, and the dulness and ugliness of our surroundings are largely reduced. If it were not for the desire of approbation, how many books that interest and delight us would never have been written ! How many noble deeds would have remained undone !

Love of approbation renders people mindful of appearances, and often fishing for popularity though destitute of talents ; but when there is little love of approbation the person is indifferent whether he pleases or displeases, and, even possessed of talents, may have too little ambition to exert his powers.

The reward of applause and the punishment of reprobation are a guide to conduct, and with many constitute a sense of duty. But this often leads to imitations of the general example and therefore does not deserve our approval, as when a person who has really little or no religious feeling is a regular church-goer, simply because he is afraid of his neighbours, or, for example, the man who is a Tory or Liberal in politics, because the one or the other party-view happens to be held by the majority, or, again, the person who subscribes to a charity not from a benevolent disposition, but because his neighbour has done the same. Such actions are not dictated by a desire to do good to humanity but are stimulated merely by a desire to obtain the applause of mankind. In obedience to the promptings of this faculty men will erect hospitals, endow universities, provide homes for the destitute. Many of our most noble institutions would fall into insolvency if all the contributions to their funds which did not arise from a pure motive of benevolence were withdrawn. Benevolence alone would never do the noble deeds that the desire to please, to gain esteem, and to become notorious does.

From the desire to earn the admiration of one's fellow-men arose ambition, which we may define as that anxious aspiration, so characteristic of the human species, to rise above our respective station, or to attain to something loftier and, as fancy pictures, better than what we now enjoy. It implies, therefore, dissatisfaction with the present, mingled, generally, with more or less elating visions for the future.

There are persons with inordinate ambition, and appetite for honours which can never be satisfied ; feeding only serves to aggravate its hunger. No sooner has the ambitious man gained one eminence than another and yet loftier aim becomes visible, and with fresh and more eager efforts and desires he strains forward to reach the summit. It is a continual restlessness, and each successful step increases the passion and renders its victim even less content and less happy than he was at the beginning.

Ambition has two sources : the love of reputation and the love of power. Love of approbation confines itself to a narrow circle ; **love of reputation** to a wider one, and is held to imply the possession of high intellectual aptitudes. Love of reputation in a high degree, over a wide area, and for a long period of time, is **love of fame** ; if the desire is merely to be talked about, it is **love of notoriety.** Men may commit all sorts of actions to achieve that end. People with a disposition to plume themselves on any petty, accidental, or temporary cause of superiority to their fellow-men are called vain.

If the **fear of disapprobation** leads to confusion, we call it *shame.* It occurs on being discovered, but may be prospective and prevent us from doing things which are condemned by our friends or by public opinion.

The social life led some men to comport themselves according to the ideas of others, but some became distinguished by preferring to act in acordance with their own views. They were men who set more value on their own opinions than on those of others. This gave them **self-reliance** and independence of character, self-confidence and self-satisfaction, which enabled their mental powers to act to the best advantage. These were the born commanders.

The man who desires to rule is necessary to all organisation, political, military, or industrial. Just as the man who loves approbation is desirous of fame, so the man with large self-esteem loves power. The direction the love of fame or power will take is determined by the strength of the other faculties. Thus wealth, political or military fame, or even mere brute strength—in short, almost anything that can distinguish us from the crowd—may under different influences become the object of our aspirations.

The civilisation of every country depends upon a small number of eminent men ; therefore the rest of us must have instincts and dispositions impelling us to follow leaders : such as suggestibility, imitation, admiration, etc. ; and will be progressive only when the rulers foster progress.

The **self-reliant** man is well satisfied with himself no matter what his intellect, personal talents, birth or fortune ; he does not envy a king. On the other hand, those deficient in this respect will be remarkable for their humility. It is a wise provision of nature that persons in the meanest situations and with the humblest acquirements have a sense of self-importance. It renders its possessor happy and contented with that " modicum of sense " which has been conferred upon him, who otherwise would be miserable if aware of his deficiencies. It is sad to think that much talent has been lost to the world through self-confidence being too weak to enable the talented one to rise to the occasion and to fill a responsible office. We talk a great deal of liberty, forgetting the fact that **obedience** is an impulse which gives restful happiness to millions of mankind. Many a slave has been freed that would have preferred to remain with his old master.

Love of liberty may be regarded as the counterpart of the love of power. As the

superior desires power, so the inferior desires liberty—that is to say, emancipation from the power of his superior. Where the power of which the exertion is resented is moral and not physical, the appropriate phrase is not love of liberty, but **love of independence.**

Self-esteem in excess leads to **conceit** and **arrogance.** Self-esteem is often exaggerated to the ridiculous, sometimes with reference to personal attractiveness, sometimes in regard to intellectual ability. The " bore " has plenty of it. Some men are successful in life through sheer " cheek."

Where our regard for self keeps us from performing certain actions deemed unworthy of ourselves, we call the attitude **self-respect.** But what we consider unworthy is, for most of us, determined by what our social environment considers to be unworthy. What is ordinarily called self-respect really is dependent, in the great majority of cases, on what people generally think regarding such matters.

Self-esteem and love of approbation are often confounded. By the one sentiment a man esteems himself ; by the other he courts the esteem of others. They are best distinguished in their abuse. The one is **pride,** the other **vanity** ; the one assumes, the other begs ; hence it is truly remarked that an individual is too proud to be vain. Pride is more connected with command, and vanity with taking counsel. The vain man attaches the utmost importance to the opinions entertained of him by others, and seeks with eagerness to gain their approbation ; the proud man expects that mankind will come to him and acknowledge his merit. The vain man knocks at every door to draw attention towards himself, and supplicates the smallest position of honour ; the proud man despises these marks of distinction, which on the vain confer the most perfect delight. The proud man is disgusted by indiscreet eulogisms ; the vain man inhales with ecstasy the incense of flattery, although profusely offered and by no very skilful hand.

Some people have so little self-esteem and are so sensitive to criticism that they anticipate it keenly ; they become morbidly **shy** and shun society. They are too self-conscious. Of course, the emotion of fear is mixed up with it ; but it is not merely fear of adverse criticism ; they are also shy of praise, and begin to blush all over. It is not always a sense of their own inferiority, for people who are convinced of their own capacities and have confidence in themselves in other ways, as in their writings, yet evince that shyness before strangers.

Shyness is natural at puberty, and is then the outcome of the growth of the sex instinct. In women, one takes it perhaps as more or less natural. Men afflicted with this complaint feel it more keenly. They feel it when in company as if they were always observed and are doubtful that the observation may not always be sympathetic, or else they are eager to make a good impression and consequently become nervous. A shy person may blush, get confused, have tremors, show restless movements, have a nervous laugh and a foolish expression, with the eyes glancing restlessly in all directions. He sometimes tries to hide his discomfort. In consequence of these feelings, he isolates himself from society and even ordinary companions sometimes, and becomes a lonely man, with all the evils of self-contemplation, self-introspection, eccentricity, etc., that are apt to develop in the recluse.

Self-conscious people find it difficult to walk across a stage when hundreds of people are looking, or to address an audience of strangers eagerly listening to them. They become awkward and embarrassed under the circumstances.

Self-reliance imparts a resolute character, not easily influenced by others ; the helpless man lacks constancy, for his actions depend on the influence of others, his conduct is therefore not uniform. Belief in one's own powers gives **tenacity of purpose** and **firmness** ; if in excess, stubbornness and obstinacy.

Some persons yield readily ; it may be said of some they scarcely have a will of

their own ; they follow the last impulse they receive, and, without strength to resist, they are easy instruments of all whom they meet. They give up persevering under difficulties ; they decline to follow the estimable motto, "Try again." Others are of an immovable character, firm in their resolutions and constant in their principles ; they do not attend to exhortations or to examples ; their conduct is uniform, and their exertions may be calculated on in various situations of life. Some persons are steady, determined, persevering in character, others vacillating, lacking fortitude and patient endurance. The greatest work demands the greatest effort ; and not only so, but this effort must be perseveringly applied, and for this firmness is necessary. When firmness is deficient, the individual is the victim of those external circumstances that may address his strong faculties, and no confidence can be placed in him, for what he says or does to-day is no guide as to what he will do to-morrow.

Stability of character is often called **strength of will.** A man who adheres tenaciously to his resolutions is called a strong-willed man, and, if this tendency exists in excess, an **obstinate** man. On the other hand, a man who vacillates, or frequently changes his resolutions, is called a man of weak will. Some men are by nature resolute and consistent, and are therefore credited with great will power. They refuse to be the sport of circumstances, to drift with the current, but strike boldly out for some definite point on life's shore. How came they by that tenaciousness ? What were the exterior circumstances that gave to it its tone and direction ? Such will power and tenaciousness will be found in most cases to be hereditary, and as regards its scope and direction only shall we find it the sport of circumstances. Small minds often exhibit a tenaciousness that leads them to success, for they are capable of being entirely possessed by the one unchanging motive. Larger minds often fail of success by reason of a want of consistency in pursuit due to the varied play of many motives, each capable of a strong attraction, on a richly endowed nature. It is the person who has definite aims in life who will appear to possess the strongest will.

The habit of perseverance or of continuous effort is that which, added to energy, constitutes **industry.**

Patience is passive endurance of labour, but also endurance under fatigue and suffering in general.

Persons with large self-esteem have confidence in their own powers, value their own judgment, and are willing to assume responsibility. If intellectually gifted they may undervalue the talents of others ; and with small intellect there may be a conceit of abilities not possessed.

When there is little self-esteem, a person gives in to the judgment of others easily, lacks independence, self-confidence, natural dignity, self-reliance. And if given to respect authority as well, he is liable to underrate his own abilities, and more apt to follow than to lead. Little self-esteem in a cautious person is likely to make him afraid to exert himself ; but, gifted intellectually, he may lead off well when once placed in a responsible position, though at first he distrusts his own capabilities.

Self-esteem and self-satisfaction are prominent in the early stage of *mania*. Such patients admit only their own point of view and their own plans. A silly self-satisfaction is noticeable in the *alcoholic*. On the other hand, self-esteem is diminished and there is a feeling of unworthiness in *melancholia*. In *general paralysis* the patient believes himself to be an exalted personage, but he changes his character almost daily, if not hourly, being one moment a great general, another a king or statesman, a third a millionaire or a strong man, giving ample evidence of the weakening of his intellect. In the later stages of *paranoia* the patient also believes himself an exalted personage, often an under-rated genius, but the character he fancies himself to be is fixed. He knows he is an important person ; he can tell you

good reasons why. His intellect is perfectly retained, although he reasons from false premisses.

Generally speaking, amongst the insane we meet with men immensely over-estimating their own importance and the significance of all their actions, engrossed only with themselves, and but little, or not at all, with external things.

CHAPTER XXVII

EVOLUTION OF THE INTELLECTUAL CAPACITIES AND THE ETHICAL, ÆSTHETICAL, AND RELIGIOUS SENTIMENTS

MAN possesses, in addition to the feelings and propensities he has in common with animals, intellectual powers of superior order and higher sentiments which are peculiar to the human race. Man possesses various elementary capacities which constitute his observation, memory, reason, and imagination. According to the degree of their development, so is the intellect of the individual petty or great.

Among the ignorant we find defective and inexact observation, influenced generally by the emotional prejudices of the observer ; weak, or what is even worse, misleading memory ; feeble reason, dependent on faith in authority ; and limited imagination. Much has been written concerning the extent of human ignorance ; but we ought to discriminate between absolute incapacity to know, and mere want of information, arising from the fact of not having employed this capacity to its full extent.

Man is endowed with intellectual faculties, and these may be divided into the knowing and reflecting. It is undeniable that intellectually we *know* and we *reflect.* It is a common observation that knowledge is not wisdom till it is compared and reasoned on by reflection. It is its combination with reflection which constitutes that knowledge which is power. The weakest reflecting powers often co-exist in the same individual with a store of knowledge which excites our wonder. Few men are equally good in reasoning and observation. There are men of observation and men whose knowledge rests chiefly on reason ; the former are more practical, the latter more theoretical.

Our ability to perceive, to reason, to learn certain subjects would not be exerted without the instinctive impulses, the needs of the organisation, which are driving forces to the employment of the intellect and give rise to curiosity. At first the intellect is confined in its range by the fears and wants which an object and necessitous condition prescribe to it ; but as curiosity is enlarged, it devises means to ends, rising continually higher and higher, and developing the several arts and industries necessary to the convenience and adornment of life.

POWERS OF OBSERVATION AND REMEMBRANCE

Animals possess curiosity and powers of observation often to an extraordinary degree. The desire to obtain food induced them to examine everything of novel appearance which came within their range of observation, irrespective of its utility. Curiosity to observe, especially anything unfamiliar, is common to all animals, and their educability probably depends on the strength of it.

The connection between memory and sensory impressions is of the very closest. Indeed, our faculty of **perceptive** sight results from an intimate combination of sensory recollections with sensory impressions. Memory apart, sensation would

mean nothing to us. Men with sight only could see, but would not perceive. Men with hearing only would hear, but would not understand. There is no sensation that can be appreciated without recollection. There is no sensation which does not call up recollections. It is beyond dispute that the powers of observation are the primary faculties of intelligence, and supply the raw material, as it were, for all intellectual exertion. They include **retentiveness** as well, and supply the material for practical knowledge. Memory, like perception, is not a single faculty, but there exist perceptions and memories for words, sounds, numbers, lapse of time, order of sequence, space, form, distance, colour, weight, objects, places, of different strength in each individual. **Each of them may be lost in circumscribed injury or disease of the brain** (see Chapter XXIX.). On these conceptions, in part, the talents of drawing, painting, sculpture, mechanics, music, etc., depend ; and from the desire to know objects as mere existences our inclinations for the study of science arose. Our perceptions and memories may be divided into those of mere existences—stationary objects—and those for moving objects or objects in time, *i.e.*, for facts and events.

The knowing powers cognise two classes of objects, existences and events—in other words, things that *are*, and things that *happen*. Let anyone reflect for a moment and he will find that whatever he knows must either have an existence or be an event. The paper on which we write is an existence—a thing that is ; if we drop it on the carpet, it is an event, a thing that has happened ; a change has taken place. Soldiers are existences, their battle is an event. The acids and alkalis are existences ; their effervescence or mixture is an event. Natural history concerns existences ; civil history records events. Now, from observing that the power of perceiving and remembering these two classes of objects, respectively, varies in a marked degree in different individuals, and that they may be lost independently of one another in lesions of the brain, we may consider them as distinct.

Speaking generally, a man with good perceptive powers is likely to be an observer of men and things, a practical man given to minute inspection and adapted to study physical phenomena. Combined with the acquiring instinct, he is likely to interest himself in the value of property and goods ; and combined with constructive ability, he will be given to mechanical operations and interest himself in machinery. A man with good perceptive powers but small reflective capacity will be a man of facts rather than ideas, better adapted for carrying out plans than for originating them. He will be a man who looks more than he thinks, of quick perception but possibly little wisdom, a man who thinks nothing is certain and worthy of attention except facts. Good perceptive powers combined with good reflective powers make a man not only a close observer of things, but also strongly inclined to trace their relations of cause and effect.

A man with small perceptive powers will be deficient in the capacity of observation and take little interest in the mere examination of objects ; and with superior reflective power, he will be more of a philosopher than a scientist, a bookworm rather than an experimenter in the laboratory. That is to say, *he is most likely* to be these things ; his tendencies will run in these directions.

Each of the perceptive powers and memories will now be dealt with in detail ; and we shall show in a later chapter that each of them depends on a definite centre in the brain and may be lost when that limited brain area is injured or diseased.

The perception and memory of **form** is commonly accepted as an elementary power. We all vary in it, as, for example, in its application to the remembering of faces.

It is said of Cuvier that he was able to recognise a similarity in form in the most extraordinary manner, never forgetting the shape of an object he had once seen. The special memory developed by this faculty is also well illustrated by those artists

who are able to draw accurately from memory; thus it is said of Turner that, having carefully looked at a ship, he was able to go home and draw from memory the details of the ship as accurately as if he had been standing in front of it.

The power to observe the **size** of objects is another elementary capacity. Its function is manifestly different from that of the faculty of form; thus a sixpence and a half-crown are of the same form, but differ in size. Another is the power of **resistance** or sense of weight.

The perception of position, giving the memory for places, or the sense of **locality,** varies greatly in people. It is not dependent on any sense in particular.

Locality is a faculty (probably complex) which appears to be more developed in savages and animals than it is in persons belonging to civilised communities. It is also larger in a provincial dweller than in a citizen of a large town, as we should naturally expect. An animal or savage would soon get lost in the forest if it were not for this faculty to guide them back to their starting-point.

The ability to deal with **numbers,** being a natural power, can, of course, like any other, be improved by exercise and practice, but no amount of practice will produce it where nature has not bestowed it. It, too, depends on no sense in particular. It is with this faculty as with all others: great ability in regard to numbers and calculation gives a great love for them.

Another elementary power is that of perceiving periods of **time,** forming a sort of natural chronometer in the individual. It likewise depends on no sense in particular. The special memory is well seen in those persons who are able to remember the chronological order of events easily, because they are associated with ideas of periods of time.

It is surprising how accurately some men are able to tell the exact time of day without referring to a watch. Time in music also comes under the same faculty, because here a correct estimation of time has to be formed, so that the notes may be played in correct relation to the time as shown by the metronome.

Though the perception of time is essential to a musician, it does not *make* a musician; several other qualities are required, which vary according to the type selected. A person with a small development of **tone-perception** thinks music a "noise," and takes no pleasure in it, not being able to distinguish one tune from another.

To the unmusical person a Mozart or Beethoven concerto is only horsehair scraping on catgut; whereas Heine rapturously declared that Paganini's violin expressed "sounds from whose bottomless depths gleamed no ray of hope or comfort . . . melting sensuously languishing notes of bliss! Tones that kissed one another, then poutingly fled from one another, and again languishingly embraced and became one and died away in the ecstasy of the union."

The **memory for words** is probably very complex. A man may have an excellent memory for languages and yet a poor memory for proper names; he may be fluent in speech and yet have a very small vocabulary. His visual memory, *i.e.*, memory for things read, may be excellent; and his auditory memory, *i.e.*, his memory for words heard, may be very poor, and the reverse.

It is doubtful to what extent ideas are formulated and exist in the mind in the shape of words—to what extent, that is, men think in words. There can be no doubt of the existence of thought in the lower animals, and that they can express their emotions and communicate them, and it is equally certain that all normal children have a copious supply of thought before they have any knowledge of

language at all adequate for thinking in words. The difficulty many people have in expressing their thoughts, and which even the most fluent speakers sometimes feel in putting into words certain ideas, is a further proof of at least a very considerable independence between ideas and their verbal formulæ.

Gambetta, as we have shown (Vol. I., p. 396), had a wonderfully developed speech centre, a better machinery for remembering and speaking words than the average man. The rest of his brain was comparatively small. He was a great speaker, because he was born with the tools to speak with, but he was not brilliant in other respects ; just like some members of our own Parliament. The speech centre by itself is usually not of much use, unless a man has the intellect correspondingly developed. Just as a great painter, who was asked what he mixed his paints with, was correct in replying " brains " ; for without brains the sense of colour alone is useless, so it is useless to have the speech centre by itself.

We see, then, that neither perception, memory, nor judgment are elementary powers of the mind. When one is said to be a man of quick perception, or of good memory, or sound judgment, we must ask—of what ?

It is a metaphysical error to distinguish *memory* as a primitive faculty. If memory were a distinctive power, it would in each individual be alike strong, and regard all subjects of recollection alike. But as this is not consistent with fact, as one individual remembers existences and another forgets existences and remembers events, while a third recalls with ease a train of reasoning, another musical airs, and another faces he has seen, or scenes he has surveyed, each perhaps weakly remembering something else of the matters enumerated, we are forced to the conclusion that there is no general faculty called memory, but that each faculty has its own power of recalling its impressions. The instructor of youths should ponder this truth well, and he will save himself and his pupil much time and labour in indefinite and desultory exercise of a supposed general faculty of memory, when in truth he will actually improve the memory of each mental power in the proper direct cultivation of the power itself.

We have not only " intellectual " memories, but also memories of our emotional experiences and the actions of our propensities. Of course, the latter are never pure memories, but are connected with the ideas we had at the time when we had the emotions and exercised the volition. That the emotions and propensities influence our memory is shown by the fact that the timid man will remember the objects and events which inspired him with fear better than other facts ; the acquisitive man will remember all that concerns money and business ; the secretive man all that aroused his suspicion, and so on.

Nothing is ever absolutely forgotten, once it has been impressed upon the mind. No impression, once recorded, ever ceases to exist. It is not lost, but merely becomes obscure and exists outside of the field of consciousness, to which, however, it may be recalled long afterwards by some act of the will, or some association, according to the circumstances of the case. It is true that many impressions are never revived, either by volitional effort or involuntarily through association, but the impression is there still and its influence is manifest in our acts and thoughts.

Attention is necessary to memory. The remembrance of anything depends upon the clearness and vividness of the impression originally made by it upon the mind, and this on the degree of attention with which it was regarded. The defects of memory, of which most persons complain, are owing more to want of attention than to any other cause. We remember what we attend to, but what we do not attend to we readily forget. Attention is the fixing of the mind intently upon one particular object, to the exclusion for the time of all other objects that solicit its notice. It is not, strictly speaking, a special faculty of the mind, but is a mode of activity equally applicable to all its states. We pay attention to what interests us—one to business,

another to music, another to science, etc., and therefore according to the natural dispositions for these subjects, so will be our attention and memory for them. We cannot separate our world from our interest in it. What we see in it is determined by our attention, and our attention is determined by our organic needs and interests. Indeed, one individual differs from another not so much in power of memory, reasoning, attention, or will, as in the sort of material to which he successfully applies these processes.

It is commonly said that in the decay of our powers through age the memory is the first faculty that fails; but this is not strictly correct, for it is the power of attention, on which memory depends, that is the first to deteriorate. Hence it is the most recent subjects—the things of yesterday or last week—those that have not been sufficiently attended to, that are the first to disappear. The things of years ago, and of early life, those that were attended to and are established, are the last to be forgotten. Another factor is that in old age our interests diminish, the elementary passions fade, and so we regard with less attention the objects and events before us, and remember them afterwards imperfectly, if at all.

Attention undergoes pathological alterations in insanity, varying from the painful monoideism of the melancholiac to the maniac's rush of ideas.

Memory must be clearly distinguished from remembrance, recollection, and recognition. **Memory** is the innate power to have an impression recalled if a proper stimulus be applied. **Recollection** is the power of voluntarily recalling impressions, using an effort of the will, to revive some impression previously stored away. **Remembrance** is the term applied when the process is involuntary, when the previously stored impression comes again into the field of consciousness without an effort of the will, as by association, resemblance, etc. **Recognition** is the word applied to that process of the memory whereby, when we see or hear a thing, we know that we have seen or heard it before; it is a conscious association of the present impression with previous ones. Recognition is therefore the essential element of memory.

REASONING POWERS

The power of reasoning upon the knowledge gained, of tracing the relations of cause and effect, and of determining the analogies which obtain among other things dissimilar, comprises the next development in the intellectual capacity.

The process of reasoning, of drawing conclusions, is sometimes performed by a simple act of comparison, or perception of analogy. A vast majority of mankind reason in this way. The whole of the brilliant field of what in reasoning is called illustration is nothing more than this process of comparison. Another set of reasoners are more severe and are contented with no conclusions which do not stand in the relation of necessary consequences to their premisses. This is truth, they reason, because it is deducible necessarily from the consideration of these other known truths brought together. These are the logicians, who distrust analogy and comparison. The faculty they use is the highest intellectual power, the percipient of the relation of cause and effect. It is clear, then, that the act of meditating can be performed in two distinct ways, by induction and deduction. **Inductive meditation** is to institute comparisons and to generalise. It is found in persons highly critical, in those fond of metaphors. An intellect given rather to **deductive meditation** is an intellect which co-ordinates, systematises, and draws consequences. Both forms of meditation may be equally active, but there are exceptions—to wit, the born critic on the one hand, and the philosopher whose mind is in quest mainly for cause and effect.

A person with dominant reflective faculties is generally gifted with depth of reasoning and strength of understanding; and if he is poor in powers of observation,

he will be more deep than clear, more theoretical than practical, better in philosophy and speculation of human affairs than in the details of science, likely to make good plans though he may be less good in putting them into practice. He will possess an inquiring and investigating turn of mind, good judgment, originality, able to clear up abstruse points and to carry conviction by irresistible arguments presented in a very intelligible manner, especially if he have the gift of language as well. With the combative instinct, he will be able to advocate and defend his opinions vigorously.

A person with little reflective power will think little in the abstract, will not be clear or correct in apprehending the principles of causation, will be deficient in discernment and understanding and injudicious in planning. Persons with small reflective power frequently have great faith in authority, and reason thus : A = B, because C said so. Such people, for example, judge the merits of a book by its circulation, just as they do the wisdom of a man by the income he earns. Small reflective powers combined with a tendency to imitation renders a person apt to do what he sees others do ; he may gain something from experience, yet will be unwilling to apply his mind to any subject requiring close investigation and research. Little reflective power combined with selfish propensities and some secretiveness render a man shrewd ; he may manifest considerable tact and ingenuity in laying plans, yet he has too little intellect to realise them.

A person possessing good inductive capacity will be keen in discrimination, and will rarely fail to catch points of difference. Good at analogies, he will readily discover resemblances and differences and will possess a criticising turn of mind. If he have good perceptive powers as well, he will be good in comparing natural phenomena and in illustrating his ideas. With æsthetic sensibility, he will make many elegant and elevated comparisons ; and with small æsthetic sensibility, he will be more argumentative than ornamental in illustration.

Altogether there are three degrees in the reasoning capacities of mankind. One man understands things by means of his own natural endowments ; another understands things when they are explained to him ; and a third can neither understand them himself, nor when they are explained by others.

It is commonly assumed that ignorance keeps people poor, but this is not the case. We are all ignorant in certain things. Only one thing is true, that ignorance leads to the exploitation by the unscrupulous. Persons of little education, but knowing how to make the most of that little knowledge they possess, often succeed wonderfully.

Insanity is primarily a disturbance of the feelings and consequently of the conduct of man. The brain disturbance must be serious before the intellect shows *permanent* signs of weakening. But there is often a want of power of fixing the attention and loss of memory, the most common affairs of life being forgotten, names, dates, figures, passing out of recollection. When perception is disturbed there may be hallucinations and illusions ; when the reasoning powers are weakened there may be disturbances in the formation of ideas, of the train of thought, or its rapidity.

When the accuracy of memory is disturbed, we see the patient unconsciously distorting facts when telling them, or he may mix real experiences and imagined experiences together without knowing it, or he may deal in fabrications which are really hallucinations of memory, the patient weaving an account of things often improbable and contradictory, that never existed, yet doing this all unconscious of the untruth. Normal and abnormal defects of memory are, of course, a matter of degree. No one remembers all his experiences, and to forget is as natural and as normal as to remember. In practice, however, little difficulty is experienced in deciding that a defect of memory is morbid in degree, since by common consent no defect is considered morbid if not extreme.

Loss of memory is often very marked in insanity. The power of recollection—especially of recent events—disappears or is considerably diminished in *general paralysis* and in *senile dementia*. At the commencement of the former disease there is forgetfulness of ordinary duties and of details of business. Sometimes the recollection of former years is present, but no recollection of what has happened half an hour before. Sometimes also there are delusions of recollection on account of the memory picture being insufficiently fixed. Or events that never happened are remembered as realities. On the other hand, a very profound degree of apparent dementia is not inconsistent with an almost perfect recollection of events. The memory is impaired in *chronic opium poisoning*, and more so in *chronic alcoholism*, where there is instantaneous forgetfulness of events which have only just transpired. On the other hand, in the early stage of *mania* the memory is stimulated, so that the patient may be able to recall whole pages of poetry or to quote extensively from standard works.

The commonest forms of sense delusions are *hallucinations* and *illusions*. The essential difference between the two is that the hallucination is solely a brain creation without any external stimulus to produce it, whereas an illusion is aroused by some real object outside the brain, and is, in fact, a misinterpreted sensation. Sense deceptions may occur in the sane. Their importance as a disease symptom in insanity rests on the fact that they exert a powerful and irresistible influence over the entire thought and activity of the patient.

Hallucinations depend upon disturbances of the centres of sensation, so that the person may hear, see, taste, and feel things which have no external objects to evoke them; and yet so vivid is the impression made upon him, because of some abnormal excitation in his brain-cells that are ordinarily excited by real objects, that he feels certain that the things heard, seen, etc., really exist in the world outside, though in truth they originate in his own brain.

Suspicion of insanity is always excited if hallucinations are present. Hallucinations, which occur also in fevers and intoxications, are not in themselves decisive as to the existence of insanity. The most that they prove is the existence of an abnormal cerebral condition. Hallucinations appear in their true light only when they stand in relation to other elementary disturbances, such as attacks of anxiety, and in the disturbed state of consciousness are no longer corrected and exercise influence on action.

Hallucinations of all the senses may occur at the same time, or there may be disturbances in only one or two fields. They may be agreeable, but more often they are disagreeable. Unpleasant hallucinations often give rise to dangerous conduct on the part of their victim.

Hallucinations of *taste* are frequently found with delusions of poisoning. When the sense of smell is affected patients frequently complain of foul odours, of gases being forced into their sleeping apartments, and such complaints are not uncommon with certain forms of persecutory delusions, which are largely based upon them.

Hallucinations of *sight* are particularly characteristic of toxic interference with cerebral action. They are common in all forms of *alcoholism*, in poisoning by various mineral and vegetable drugs, in exhaustion, starvation, and long-continued thirst. Hallucinations of sight occur in *acute mania*; horrible scenes are witnessed in the hallucinations of *melancholia*; repugnant objects in motion in *acute alcoholism*; fear-inspiring visions occur in *inanition delirium*, and frightful hallucinations in *puerperal mania*. *Insane epileptics*, too, are sometimes subject to terrifying hallucinations, and ecstatic visions are sometimes seen by *hysterical women*.

The most common hallucinations are those of *hearing*. The patient hears voices, and generally words expressing definite ideas, though he is often unable properly to refer them to any speaking person. Sometimes, instead of external sounds or voices, the patient has a consciousness of an internal voice that may be as real to him as any external auditory perception. Their utterances may be

agreeable, but it is more often the case that they are abusive, threatening, or commanding, and annoying or absolutely distressing to the patient. The belief in their reality is so general that they are a positive source of danger, for one day the subjects may be able to control themselves and disregard the "voice"; the next, they may feel bound to obey the voice and do what it commands, whether it be homicide or suicide.

Hearing voices is often the first sign of brain disturbance and can remain stationary for years; but for these voices such people may be in all respects sane, and conduct themselves as ordinary members of society, yet they are always to be looked upon with suspicion. Abusive and threatening voices are commonest in *paranoia*; they are constant and follow the patient wherever he goes.

Besides the deception of the special senses, there are also found in the insane hallucinations of general sensation and visceral feeling, as well as of the cutaneous surfaces.

Illusions are also deceptions of the senses, but they have an outside object as a starting-point. An illusion is a false perception. The object is not recognised in its real character, but is perceived as something else. The patient really hears, sees, tastes something, but thinks it is other than it is. He misinterprets it. His sense impressions are as correct as ever, but the judging power is at fault. Some persons may experience illusions, but by bringing closer investigation and judgment to bear on them they are able to correct the false impressions; the sane man compares the visual object of delusion with the impression of other senses and the perceptions of other persons; this is exactly what the madman cannot do. He concludes that what is only an illusion is a reality. But the illusion is not the madness. The madness lies in the want of power or resolution to examine. He is insane because he meditates and indulges in the morbid sensation, which thus acquires fresh force.

The illusion, like the hallucination, may be of a pleasant or unpleasant character. Illusions of sight are the most common in the insane. Next to illusions of sight come probably those of hearing, and all the senses may be thus subject to misinterpretation in states of mental disorder. A very striking class of illusions is that of the internal or visceral sensations; a vague bodily sensation is attributed to some special cause—such as having a snake in the abdomen—altogether different from the reality.

When insanity affects the intellectual sphere, ideation suffers. There may be abnormally slow thought, or absurdly rapid thought, or such a flight of ideas that the association between them can no longer be traced by the bystander—the stream of thought has become incoherent.

The insane do not differ from the sane by the apparent loss of the faculty of reasoning; but having joined together some ideas very wrongly, they mistake them for truths and they err as men do who argue right from wrong principles. Of course, there are insane who both reason illogically and incoherently, and establish wrong premisses from which their reasoning proceeds. A marked feature of impending mental disorder is seen in the tendency to allow the mind to wander away from the proper duties of life, and luxuriate among scenes of the imagination, or of ill-regulated fancy, becoming dreamy and abstracted.

Abnormally slow thought, giving rise to dearth of ideas and expression, occurs with a depressed emotional state, as in *melancholia*. Abnormally rapid thought, a rapid flow of ideas, occurs in *mania*, and becomes more and more jumbled in expression as the disorder progresses; this latter condition is accompanied by an exalted emotional state. The rapidity of thought may increase to such an extent that the patient loses the thread of conversation, he is no longer able to arrange logically the abundance of material that comes to him, but he expresses senseless ideas, disconnected sentences, words, and syllables. Since the flash-like ideas can

no longer be co-ordinated or placed in logical sequence, the result is incoherence. Incoherence of thought and speech is, however, not exclusively the result of increase of thought or a symptom only of maniacal states. It occurs also in various other abnormal conditions.

Whilst rapidity of ideation leads to verbosity, slowness of ideation induces taciturnity. The person speaks only after long pauses and much hesitation, in a subdued voice, and only in response to very strong stimulation, or to categorical and persistent questions.

In the early stage of *mania* the acceleration of ideas is, at all events at first, so slight that the patient may give the impression of being an entertaining conversationalist, full of spirit, wit, and humour. It is in *acute mania* and in *acute alcoholism* that the ideas are confused, and often there is a repetition of ideas. The intellect is restricted in *epileptic insanity;* there is mental enfeeblement in *chronic alcoholism* and progressive mental weakness in a formerly clever youth occurs in *dementia præcox*. In *melancholia* the intellect also remains clear, its processes are only retarded, because thinking becomes painful, so that the ideas do not flow, the response to questions is slow, and patients are incapable of long sustained mental effort. Abnormal slowness of ideation occurs also in states of *mental weakness*. The most marked derangement of ideas is of course in *dementia*.

A lack of ideas is characteristic of *idiocy* and *imbecility* from arrested brain development, and since the intellect acts as an inhibitory force and checks the animal passions, there is lack of self-restraint in the weak-minded. As regards his stock of ideas, the imbecile has been described as a pauper, the dement as a bankrupt. Their intellectual level is the same, but the one does not rise because he is unable to learn, the other fails because he has unlearned what he knew. The imbecile is and remains mentally a child, but the dement retains from his bankrupt stock remnants of developed intelligence.

Day-dreaming is done by the sane and overdone by the insane. It is fraught with serious mischief to the mind. There is pleasure attached to its illusions, which renders it seductive and dangerous. Great activity of the imagination regularly accompanies an increased susceptibility of thought to external causes and susceptibility to auto-suggestion. Mental abstraction occurs in *hysterical insanity*, and day-dreaming and immature philosophising in *dementia præcox*.

MANUAL DEXTERITY AND CONSTRUCTIVE CAPACITY

Man and some other animals have the ability and desire to build both a home and a place for their store of savings. With the advantage of manipulative organs and a progressive brain, man gradually developed a capacity to understand and to utilise the forces of nature. As a handicraftsman he fashioned tools and weapons, with the skilful use of which he got the mastery over all other animals. With a knowledge of the uses of fire, the art of cooking his food, and the power of fabricating materials for clothing his body, he accommodated himself to the vicissitudes of climate, and so greatly extended his habitable area on the globe. The element of conscious constructiveness appears to be manual dexterity, and it reaches its zenith in the inventions of art and industry.

Children frequently excel in fashioning a variety of figures of animals and things long before their understanding is matured. Idiots have been known to excel in mechanics; while some men of great talents have been unable to fabricate or construct. In short, the fact is undeniable that genius for works of art is not possessed in proportion to the strength of the understanding.

Constructive ability with large perceptive powers gives talent for drawing, modelling, planning, and inventing. With æsthetic sensibility as well, there is passion and ability for the fine arts. With the constructive tendency, but small powers of observation, the person may understand machinery but will be awkward

in the use of tools. The study of machinery has no interest for the man who has little constructive ability, but if he has good powers of observation and imitation he will be able to learn to do what he is shown. If of good intellect, but without any mechanical talent, he may still be able to direct others.

IMITATION

Imitation is another natural capacity, by which a large portion of the experience of infancy is acquired. Children imitate their elders, and thus is preserved the continuity of manners and tastes from one generation to another. To this propensity the family and the nation owe most of their external uniformity in dress, manners, and culture. Paradoxical as it may appear, it is only the imitative mind which can attain originality; the artist must learn to copy before he can create. The tendency to reproduce with the hand whatever pleases and astonishes the mind undoubtedly began at an early period in the history of man.

The faculty of imitation is often defective, and is sometimes in excess. There are many occasions on which imitation cannot be achieved, either at all, or without much labour, and many unsuccessful attempts, as every teacher of handicraft and bodily exercise knows. The power of accurate imitation diminishes with advancing years and differs much in different people. While a strong tendency to instinctive imitation is a sign of a mind of low calibre, some forms of imitation, as, for instance, the subtle imitation in high-class parody, of the spirit as well as of the form of the original, demand faculties of a high order. Mere instinctive imitation is seen at its height in monkeys. The power of imitation is essential also to the mimic. Persons without intellect, children, and idiots are sometimes very clever in imitating the facial expression and manners of people with whom they come in contact, which shows that it must be a natural gift independent of the understanding.

When there is little gift for imitation and considerable self-esteem, a person will not try to imitate other people, but will have little inclination to adopt other people's ways and opinions, and will prefer to go his own way.

ÆSTHETIC SENSE

Another power of the intellect is that of synthetising and creating. From the moment of the creation of language, the intellect is able to pass from the useful material creation to a disinterested creation; from the day on which it perceives it can work in the abstract it gives itself up to the creation of ideas. The synthetic creation of ideas is a characteristic of mankind, and especially useful to the poet and artist, but the scientist also cannot do without it. Many people possess the power but cannot give expression to it. This power of inventing scenes or objects invested with the qualities most pleasing to ourselves is called the *æsthetic sense*, or faculty.

The æsthetic faculty is manifested in aptitudes which range from supreme talent in artistic expression to an absolute insensibility to beauty. It is, of course, independent of the power of production. It may manifest itself in mere appreciation. For one creative artist there are thousands of admirers of art.

Man, unlike animals, can enjoy things apart from their utility, merely for their beauty. This is not the effect of intellect, for highly intellectual persons are often very poorly endowed with it. Two men with equally good eyes may perceive an object, but only the one with the æsthetic sense will seek for grace, elegance and beauty and enjoy them when observed. Poets and artists possess this æsthetic sensibility, and also many other persons who lack the other powers by which they might give expression thereto. Such persons long for something more perfect than the scenes of mere reality; a plain, unadorned description of things would not

satisfy them. They love the ideal and are enthusiastic in their appreciation of whatever manifestation of it may appeal to their natural aptitudes and dispositions.

A certain proportion of the spare energy, left over after vital requirements are satisfied, is expended on the contemplation of beauty and the making of beautiful things. The contemplation of beauty, and the measures taken to go where beautiful things are to be found, constitute one phase of æsthetic conduct; the making and acquisition of beautiful things constitute another.

Some hold that the æsthetic sentiment is akin to play. They see a play at human passions in poetry and the drama. But there is more truth in saying that imitation is akin to play, as we see it illustrated in the conduct of children. The **play instinct** is possessed by both animals and man, but is not an instinct in the proper sense of the word. It arises from the pleasure that exists in activity, provided the activity be spontaneous and consist in the normal exercise of the faculties. That it is not only imitative is shown by boys and girls not imitating the same thing. The feeble-minded are usually entirely without æsthetic sensibility, yet the tendency to imitation and play is rarely absent. All young animals are given to play. Indeed, some authors think the play instinct an independent disposition.

The **feeling of the sublime** is a form of the æsthetic sentiment, but is a complex mental power.

There is the poesy of painting, of music, and even of religion. Fantasy sees things beautiful or embellishes to make things beautiful, but the reality, the truth, is at its basis. If we could entirely abolish poesy, it is a question whether anything would be left to make life worth living.

Persons with strong æsthetic sensibility positively abhor the coarse, low, sensual; they are fond of refinement and style, and enjoy the ideal. If they have small reflective power, they will manifest more refinement than solidity, more rhetoric than logic, more delicacy than vigorous intellect. Persons with little æsthetic sensibility are contented with few elegances in life, look at poetry and fine arts with little enthusiasm, and prefer plainness to ornament.

ALTRUISTIC SENTIMENT

Persons with a lively imagination are generally very susceptible to impressions, some only to the impressions of objects, others to living things; hence are they easily affected by the happiness and distress observed in others, and if their mental organisation supplies them with no counteracting motives, they may act up to the feelings produced in them, and exhibit kindness, charity, and generosity, thus leading to the diffusion of happiness. They manifest the *altruistic sentiment.* One of its elements, **sympathy,** is that susceptibility which renders one individual ready to catch the contagion of the emotion of another individual, leading men to grieve at the sorrows and rejoice in the pleasures of their fellow-men.

Sympathy is the power of realising to ourselves the pains, pleasures, and emotions that do not concern ourselves at the moment, but are manifested in our presence by some other person. Some men have a remarkable aptitude and disposition to enter into the situation and states of mind of those about them, while others are engrossed exclusively with what concerns only themselves. Sympathy is confounded in all languages with tender feeling, but is nevertheless a distinct phenomenon. Love undoubtedly inclines us to sympathise with one another; but we may have sympathy for many persons whom we do not love, as may be seen in the lifelong endeavours of Howard to ameliorate the fate of the jail population.

Benevolence is a pure-hearted sympathy, without any thought of return or reward. Benevolence consists not only in giving. It is pure benevolence to suppress one's own humours and desires when these would be lacking in kindness or sympathy. The softness and consideration, which are the charm of politeness, are

the result of it. Deficiency in it, on the other hand, produces callousness to the misery and suffering of others. Even robbers can be benevolent; many a man steals in order to give away. On the other hand, there are people who are benevolent, but only at the expense of others.

None are so benevolent as the moderately poor, because they are not too far removed from utter destitution to recollect and realise the misery of want. The rich might have abolished poverty by now. The thousands of millions spent on war would have gone a long way towards it. But the rich man is unable to realise to the full extent what poverty means. The only thing he can and often does realise is the meaning of sickness and death; and that is why his benevolence is exercised for the benefit of hospitals. The greatest benefactor in this direction is often one who would not help a poor man with a sovereign.

Benevolence, when active, gives a warm and glowing feeling of kindness and good-will, a tendency to "rejoice with those that do rejoice, and weep with those that weep." Such a person's sympathies will be prompt and sincere. With absence of selfish disposition, he will be charitable and forgiving, have ready sympathies and an open purse. Active benevolence with large social feeling adds liberality to friendship, but with large acquiring instinct, he will be more kind than liberal and give his services rather than money. A benevolent person with considerable combativeness will be more severe in word than in deed, except when in passion; and with little religious sense will regard charitable work more highly than religious faith.

Philanthropy is sympathy with mankind as men and is both a positive and a negative virtue; it attempts to promote happiness as well as to alleviate misery.

MORAL SENSE

The peculiar feeling of satisfaction or dissatisfaction which accompanies the reflection on our own conduct or which the conduct of others generates in us, in combination with reason, constitutes the moral sense, and this faculty, including both a rational and an emotional element, not only passes judgment on our past actions, but contributes in no small degree to shape our future behaviour.

The moral sense took its origin from the desire of mankind to live together. The wish to live in families imposed upon man certain obligations and duties which varied according to the wants and habits of each community. Man had to act not solely for his own benefit, but had to take the welfare of his family or community into consideration. The great principle has always been: Do unto others as you would be done by; or the negative: Do not to others what you would not wish that they should do to you. Moral conduct is essentially social conduct, at all events the higher forms of it, which involve the voluntary control and regulation of the instinctive impulses.

The moral sentiment is complex, consisting of sympathy (a community of nature and disposition), the altruistic or benevolent tendency, the sense of justice, the desire of approbation and the fear of disapprobation (fear of public opinion, of law, of God), and contains also some intellectual elements.

Take the moral sense, and examine the actions which it sanctions and those which it forbids, and thus analyse, or, as it were, decompose, its nature, and it will be found that the actions which it sanctions are those which may be proved by sober reason to be conducive to the well-being and the progress of the race, and that its prohibitions fall upon the actions which, if freely indulged in, would lead to the degeneration if not extinction of mankind. Thus morality simply includes the rules and regulations by which we may all live together in the most happy manner

possible. Murder and theft and lying can never be to the interest of society; although in war, political economy, and diplomacy they are still thought to be so.

The selfish tendencies manifest themselves without training and spontaneously, and are therefore more active in the child, even though it have marked latent altruistic sentiments. It has yet to learn *self-control* before the moral sentiments can manifest themselves. All the moral dispositions require education: a love of justice does not tell us what is just.

The practice of morality usually extends only as far as persons think they can perceive some personal advantage or immunity from punishment to be gained by it; hence it is that those who can extensively foresee future consequences of their acts are more moral than those who are ignorant, not so much because they have better intentions as because they can perceive the future effects more clearly than those whose minds are more occupied by immediate pleasure and personal desires.

Ordinary persons are practically compelled to "swim with the stream," because the sanction of their fellow-men is the chief regulator of their conduct. To gain the approbation of one's fellow-men is a factor in morality, for the man possessing love of approbation takes prudent care in avoiding the resentment of his fellows. To secure the general praise, avoid the general blame, and escape the general ridicule, a man imitates the general example, and the pressure of this external force upon his actions will be felt by him as a sense of duty. The exercise of self-restraint to prevent injuring others in person, or property, or feeling, constitutes morality; and the doing of such injurious acts is immorality, and may or may not be crime, according as it is or is not punishable by law. Immorality and crime, then, are disorders of conduct in the sense that they are departures from what the universal consent of mankind admits that conduct ought to be.

The mistake is often made of attributing moral transgression entirely to impairment of Will, as if man were instinctively moral in tendency and, when he does not follow his moral impulses, simply lacks the will to follow them. This is a serious mistake. There is in all of us a constant conflict between the moral, *i.e.*, the altruistic, sentiments and the self-preserving tendencies. Some are by nature endowed more with the one than the other. The man with the selfish instincts in predominance will exercise his will in that direction; thus moral obliquity may be the result of powerful volition. Children are relatively strong-willed, yet defective in moral sense and conscience. The will to commit breaches of social ethics may be as strong in one individual as the will not to commit them is in another. Right acting, indeed, may require no effort of self-control whatever.

When we say that persons with a relatively weak will are more liable to transgressions, we really want to indicate that there is such a lack of balance in the arrangement and degree of the various mental powers that the individual is the play of circumstances and can be easily influenced in one or other direction.

The man in whom the altruistic sentiments are stronger than the egoistic propensities will be good by nature; the man likely to sin is the man in whom the altruistic and selfish tendencies are equally balanced and who is therefore more at the mercy of external circumstances. Then there are men who simply follow their animal inclinations, lacking in their organisations any checking power of social or altruistic feeling. These are the morally weak-minded. Nearly all moral disease arises from unregulated desire; every desire exposes a man to the temptation of gratifying it, and animal desires are usually the most imperative.

Goodness has to be its own reward and badness its own punishment. The good man is not necessarily happy, nor the bad man miserable. But the good man has inner compensations in the known quality of the life he lives; he finds salvation in the freedom from worry, pessimism, fear, and unfaith. The only temptation is from within. When there is no evil within, the evil may come from without, but will

provoke no response from us and will be to us non-existent. The spiritually-minded is not preserved from shipwreck while the ungodly is drowned, but through his calmness of mind he may see his chances of escape.

The sentiments of common interests in the primitive family and tribe, and the habitual reprobation of certain acts by individuals as injurious to the family or tribe, in course of time generated a **sentiment of right and wrong** in regard to such acts ; but the approbation or disapprobation, which may turn our choice, may not be of our fellows, but of ourselves. In fact, man, in the solitude of his own thoughts, is still a social animal, and creates a companion out of himself—a critic to whose praise and blame he is keenly sensitive. When a man does, or refrains from doing, an action which he thinks is right or wrong, he is guided in his conduct by the application of certain rules or principles implanted in his mind, either naturally or by the influence of external circumstances. When this moral judgment becomes so active in its operation as to be instinctive it is called **conscience.**

Whenever a man does anything which he knows would meet with the disapprobation of his friends he experiences a feeling of uneasiness, a feeling of guilt ; and when he does something which would be applauded by his fellows he has a sense of happiness. This is the basis of the moral sentiment with which the voice of conscience is indissolubly associated. A non-gregarious animal can do what it likes ; it has only itself to consider.

We follow the traditions of the herd, but these traditions vary, hence the variety of conscience. The fashions of the herd at the time cause opinions to be held which may be false, but if we depart from the customs and fashions of the herd we are likely to feel uncomfortable and to be regarded as eccentric and to be ostracised. The new generally encounters the opposition of the herd.

All men's desires, lusts, and passions, if uncontrolled, lead to evil, and against these conscience bars the way. Conscience is a simple desire to do the right thing without hope of reward, sometimes not even caring for the esteem of others or self-esteem, but acting merely from a natural tendency for righteousness. It is the instinctive application to the actions of social life of certain moral ideas found in the mind, and it therefore depends on experience and education for its peculiar phase of activity.

Conscience alone is a deceitful guide. Like justice, it is blind. What passes for conscience and moral sense in some individuals is merely " dog conscience," *i.e.*, fear of consequences. Many men act rightly only from fear of punishment ; and no distinction in this respect need be made between the man who fears the punishment of his fellow-men and he who fears the punishment which he thinks will be meted out to him in another sphere. The fear of sharp punishment may deter a man from evil-doing ; but it does not make him moral.

Scratch ever so lightly the back of civilised man—remove his inhibitions, as by a blow on the head which obliterates all his higher attributes—and we find the animal nature, *i.e.*, the primary instincts. Most of us are a mixture of good and bad qualities. No man ever merited heaven, no man ever deserved hell. Many men appear virtuous because they lead a life so monotonous that they are outside of temptation and their passions are bound to remain dormant. Many men are wicked because their mental powers stopped short at the development of the moral sentiments. There exist moral imbeciles with the animal instincts and the intellect unimpaired. Such persons are deficient of moral guilt. Only those men and women whose active animal propensities are governed by sound moral sense will, when having committed wrong for once, feel the torture of conscience in the loneliness and darkness of the night, and be afflicted with those terrible dreams which are alleged to shake nightly the guilty soul. Not so the moral imbecile. His conscience is not strong enough to torture him.

I repeat, let the admirers of the excellence of the human species reflect why, in all

ages and in all countries, robberies and murders have been committed; and why neither education, legislation, nor religion, the prison, hard labour, nor the wheel, has yet been able to extirpate these crimes. In Queen Elizabeth's time, out of every thousand persons born, five were actually hanged, as a matter of recorded statistics yet it did not eliminate crime. Do criminals rob and murder for the sole pleasure of exposing themselves to punishment, and without any temptation? Suppose we allow it to be education, and not nature, that produces vicious tendencies, the difficulty still remains the same, because education does not depend upon him who receives it; and education never would develop either good or evil inclinations were not their germs previously existent in human nature.

A conscientious tendency in a combative character gives great moral courage. If combined with self-esteem, the person is inclined to be censorious; and if in addition there is lack of benevolent feeling, the individual is likely to set up himself and his doctrines as the only correct standard of truth. Conscientiousness and cautiousness combined render a man uncertain what his duty is; he will be fearful of doing wrong, and prefer not to act at all than fail to do right.

Then there are persons with few and feeble compunctions of conscience. They will consult expediency rather than duty. If they have love of approbation, they will do right when to do wrong would injure their reputation. If their intellect is good, their conduct will be governed by the dictates of reason.

As a rule, the higher mental powers, those which are added latest in the scale of evolution, are the first to deteriorate in anything that affects the brain, whether by poisons, injury, or disease; hence a change in the moral nature of man is often the first symptom of unsoundness of mind. The patients become abnormally egotistic, or else there is apathy and indifference, or complete ethical insensibility.

Only in *melancholia* ethical sensibility becomes exaggerated, conscientiousness hyperactive. Such patients accuse themselves of having neglected their duty, or they worry about supposed sins committed in their early youth, of which they had not thought until the commencement of their illness. When delusions are added to this state of mind, such persons make all sorts of self-accusations.

The moral character also undergoes remarkable transformations in the involution process of *old age*. There are men who, as they grow old, lose all feelings of affection, take a dislike to their own children, and exercise a headstrong tyranny over those who are dependent upon them; or they become erotic, vain, ambitious; or utterly selfish. Others become more indulgent, amiable, generous, and more serene than they used to be, owing to the disappearance of disturbing passions and preoccupations. There are some who lose in virtue and there are others who only lose some faults.

RELIGIOUS SENTIMENTS

Closely allied to the æsthetic and ethical feelings are the feelings of *wonder* and *awe*, aroused by the sublime and vast in nature, the feeling of *veneration* and reverence awakened by the recognition of an exalted influence and authority, *faith* and belief aroused by appearances for which the intellect can find no natural causes, and the *spiritual* feeling arising from appearances which suggest a heavenly power.

Faith is a fundamental principle of the mind and is first instilled by parental authority. Without faith no obedience. Men are not moved by knowledge, but by feeling. It is not knowledge which brings happiness; it is faith. Hence we cling to the latter, though our reason tells us that we have no evidence for our belief. Faith will make martyrs of those who would be terrorised out of convictions that were voluntarily chosen.

Faith is to a great extent involuntary, operating silently and intuitively to supply the imperfections of knowledge. Habitually, but unconsciously, we depend

on faith in every perception and every act, in every inquiry after truth, and every expectation of a practical result. It is the admission of certain inferences beyond knowledge; whereas knowledge is inference from experience. Faith by verification is often transformed into knowledge. Every increase of knowledge supplies a wider and firmer basis of belief. If faith be possessed in very large degree, and not checked by reason, it is apt to produce *credulity*. True faith must be in alliance with the intellect—that is, it must be a belief in things probable. A morbid eagerness for a cheap and easy solution of the mysteries of existence is not sound faith, but a hindrance to philosophy and true religion.

The abuse of faith leads to *prejudice*, the prejudgment of a problem, arriving at a conclusion without having it submitted to the intellect for examination. Many subjects are decided in this lamentable manner. True, we do not always act upon our prejudgment, but few people can say that they are entirely unaffected by it. We see this principle of faith most strikingly illustrated in that most extraordinary process called hypnotism. It is not merely due to a suspension of reasoning power, but the process seems to establish a proclivity to believe what is stated by another. The creation of prejudice in the minds of the people by unscrupulous persons has blasted the character of many a man—a whisper believed in is often sufficient for this. It will damn the measures of some particular statesman, however wise and necessary they may be. It will confirm without examination, or condemn unheard, any stated policy. In fact, political partisanship rests upon it.

The man who has formed an erroneous opinion has himself formed it and knows the grounds on which it rests. If he can be made to see that his reasons are ill-founded, his opinion goes at once. The man with a prejudice, however, has no proper foundation for it. He does not himself quite know why he thinks so, and therefore he sweeps arguments aside, and is of the same opinion still.

Midway between deference of love and the deference of fear is the deference of **awe.** It springs from the consciousness of that which is greater than ourselves, even though there be no tincture of fear. We stand in awe of persons who are totally beyond us in their superiority, who exist in a sphere of power and glory, which transcends even our understanding, and thus awe has a religious as well as an æsthetic side.

Wonder is generally our first impression, when we come across anything that we do not understand. It aids faith in believing things without examination. Those in whom the feeling of wonder is small cannot believe things without satisfactory evidence, especially if their intellect is developed. The less man's reasoning faculties are active, the greater is the attraction which the marvellous and the miraculous have for him; and the readier is the credence he gives to them. Man has by nature a disposition to credulity. He loves the marvellous and mysterious.

Reverence or **veneration** appears to be a combination of love and awe; or love, admiration, and fear. Veneration, in its connection with earthly objects, gratifies itself by deference for superior worth or talent, for ancestry, for titles of honour, and even for inanimate objects which have become associated with these or other great qualities. It is a tendency to look up to and admire superiors in rank and power. Without veneration for authority the world would be uninhabitable to the lovers of order and justice. Veneration is eminently a conservative force. It constitutes the chief ingredient in the adoration of religious worship. There is no worship without veneration.

Religious belief consists of an intellectual element and an emotional feeling. It bears at the lowest stage the character of fear. That fear first created gods is borne out by the fact that evil beings were worshipped before good ones. Belief in gods and belief in immortality are at the lowest stage one, for the gods believed in are the spirits of the dead, and those spirits only the object of worship which are thought capable of doing harm. Religious veneration is here simply a recognition

of power. A higher stage is reached when the extraordinary, inconceivable and wonderful awakens religious feeling; this acquires then the character of admiration and of reverence, and begins to be of a disinterested nature. Man's reasoned beliefs are not the whole of his spiritual nature, hence he is still a prey to religious emotions.

Religion is as old as the human soul, and is the expression of its fundamental needs. Dissatisfied with the world as it is, man seeks to flee from it and attempts to discover another, to construct "a new heaven and a new earth."

Whether primitive man was born with a religious sense, or whether he acquired it at the stage when he became capable of abstract ideas, is an open problem. Certain it is that this sense has become innate in the course of thousands of generations, though like other senses it is weaker in some and stronger in others, and some seem to be born without it.

The tendency to worship is found in different degrees of strength and forms of manifestation in different individual organisations. Just as not all who can handle a pencil are artists, not all who can appreciate the practical results of logic are philosophers, or who can make rhymes are poets, so the spiritual capacity is naturally of varied grades. The religious sentiment may predominate just as an inordinate tendency towards music, poetry, mathematics, or any other engrossing pursuit may predominate, and make the character one-sided.

Religion is a revelation of man—an historic and progressive revelation of man's hopes and fears, man's knowledge and character. It is an additional powerful motive to correct living. The religious spirit within fortifies the soul, clears the mind, invigorates the nature, and strengthens the heart. Religion keeps people moral, but it is not the religious creed which is the basis of morality.

It by no means follows that because a man has strong affinities naturally for worship that he should therefore necessarily have a vigorous moral faculty, or a fuller and clearer sense of right and duty than other men have. He in whom the tendency to worship is strongest has not necessarily the noblest type of mind. It is an absurd supposition to think that because a man has not a natural capacity for intense religious impulse, but only possesses a cool reasoning mind, artistic skill, or fine moral intuitions, he is therefore inferior to the person who is susceptible of rhapsodical fervours, or to the person who is chiefly instrumental in unlocking the wonders of science, and setting forth the multiplying harmonies of the universe, and whose lips only utter the varied wisdom pertaining to visible things and every-day life.

Morality has suffered many times not a little from its connection with religious creeds. Morality survives when creeds die, having its more secure foundation in the hard-won experience of mankind. Theological doctrines vary amongst mankind, but the religious sense is in all alike and leads everywhere to moral rules of conduct. Some religion is necessary for moral conduct, but not theological dogma. It is not the fault of religion that many people are nowadays more influenced by the fear of their neighbour's censure than the fear of God, but the lack of faith in theological teaching.

Religion and theology, as I have pointed out in a previous chapter, are not synonymous. Religion is the affair of the affections, theology of the intellect. Religion was active long before theology was, and will not cease with the decline of theology. A person may hold definite theological doctrines and yet have no spiritual feeling; on the other hand, a scientifically enlightened person may yet be deeply religious; for science is not antagonistic to religion, only to theological dogmas. Science tells us only *how* things happen, not *why* things happen.

Often we judge men not by their religion, but by their religious observance. Men have been denounced as infidels and atheists, because they did not subscribe to all the dogmas of a particular creed; but a man may be highly religious without

belonging to any particular Church. Religion is based on feeling, not on reason. Priests have laid down dogmas according to their reason, but the state of knowledge was not then what it is to-day. Feelings are pretty well alike in all of us, but reason requires a stock of information; hence we vary in our interpretation of religious doctrines, unless we accept them simply on the faith of authority.

Science can offer no substitute for the religious emotion; for religion is made up of belief alone, not of knowledge. However much the modern intellect trained in strictly scientific pursuits may try to curb the spiritual inclinations, there can be no doubt that the religious sentiment has become an element of our nature. Even the atheist experiences its emotions when circumstances arise which appeal to his feelings rather than to his intellect—that is, when he allows his nature full play. The atheist, as a rule, argues against theological dogmas but not against religion. The two are not synonymous; just as a man's vision does not depend on his theory of light. Dogmas signify the profession of certain fixed beliefs, but the measure of one's belief in the doctrines of one's creed or Church is not the measure of one's religion. The individual is subordinate to the Church in his religious beliefs. The Church stands between him and his God.

The influence of religion, which formerly detached so many minds from their immediate cares, is gradually diminishing. The unseen has receded; the eternal has diminished; the infinite has dwindled; the reality of the divine has become less credible; there is an all-round depreciation of religious values. Our generation is not opposed to religion, it is only too busy looking after its material welfare to concern itself much with it. The average man is apt to conceive of religion and spiritual culture as things which it may be quite laudable to cultivate, if one can spare the time and has the inclination, but which have no vital connection with the real business of life. He neglects his inner life in the pursuit of material things and the over-valuation of all the external improvements which technical science has made possible. Religion for a good many people seems no longer to exist save as an honoured name, which once had a good deal behind, but which to them is a mere remembrance which their piety and imagination strives to embellish still with the colours of reality. For a considerable number of other persons, religion is simply imitation; it is not inwardly experienced in their feelings or in their beliefs. Such people simply reflect the sphere in which they live. The decay of faith is not due to some deadening of the religious emotion, but to a decay of the beliefs which allow the emotion to assert itself. When people were still ignorant religion gave them a theory of life. To-day the theological dogmas are considered antiquated, people have grown indifferent to them, and, unfortunately, many are indifferent to any religious impulse whatsoever. There are still many people who profess some religion, but few men and few nations act up to what they profess. In spite of a very great number of religious systems, there is comparatively little religion upon the earth. There are several reasons for this, among the chief being that thousands of the clergy are teaching dogmas which they themselves do not believe, in a manner that does not carry conviction to others. What is really needed is a teaching that will satisfy the modern trained intellect at the same time that it inspires the spiritual graces; such a teaching must be authoritative if it is to be effective, and it can only be delivered by those who are cognisant of the difficulties with which they have to deal, and are genuinely possessed of the beliefs that they propagate.

By miracles of invention we have secured control over steam and electricity, but we are not yet masters of our souls. The ethical function of religion is to strengthen the power of self-control, to afford a sufficient motive to self-denial and self-restraint, and to inspire self-sacrifice for the sake of others. Most people pray to God to give them what they do not deserve; but prayers for such subjective qualities as for patience under affliction, for charity, for courage, may indeed be said to assure themselves of being granted, for by placing the mind in an attitude of

patience, or charity, as the case may be, they fit it for the habitual exercise of these functions. It is in this expectation of elevating our character that we should be altruistic, not in the expectation that the accumulation of good marks will open the doors of heaven to us. A critical analysis of our conduct as in meditation elevates the intellectual and moral faculties above the animal propensities and thus further strengthens the mind in the right direction. Even a prayer for health in a truly devout person may have a beneficial effect through the increase of nervous energy applied to the ailing part, in the same manner as suggestion acts therapeutically on many functional disorders and occasionally improves the condition of diseased organic parts. Where faith and spirituality predominate over the animal tendencies —the spirit over the flesh—there is less possibility of succumbing to the temptations of sin, and certainly little chance of sinning becoming habitual. Many men would never acquire those morbid habits, for which they seek the aid of the physician and hope to be relieved by "hypnotism" or "suggestion," had they more spiritual faith. They are unable to control these habits, the indulgence of which was once a pleasure and is now a curse to them, for lack of just that balancing power which the higher sentiments would give them, and we physicians have to instil into them and render permanent just those uplifting ideas which guide the conduct of all good and honourable men. "Suggestion" treatment produces wonderful results, but were the moral and spiritual faculties more active, there would be less need for it.

When the religious sentiments are developed in excess the person is inclined to mysticism; and when perverted or not guided by the intellect there may be superstition, bigotry, fanaticism, delusions, and a ready belief in supernatural phenomena and mysterious occurrences. The intellect being less highly developed, it is guided by the stronger impulse, and may even be employed to search for arguments to support the credulity.

Defect of religious conduct is common enough without carrying with it any implication of insanity; but excess and disorder are occasionally seen, and are more decidedly abnormal. In insanity we often find a devout person beginning to exhibit indifference to things sacred, becoming irreverent, profane, flippant. Others are possessed by religious doubts; while still others develop excessive religious devotion, as in *epileptic insanity*, or absurd ideas of a religious and occult nature, as in *dementia præcox*, or delusions of a religious character, as in *paranoia*. Delusions of a religious nature also occur in *hysteria* and *melancholia*.

SECTION II

THE MENTAL FUNCTIONS OF THE BRAIN

CHAPTER XXVIII

THE BRAIN: THE ORGAN OF THE PSYCHIC ACTIVITIES

IT is generally acknowledged that **the brain is the structure through whose medium all mental operations take place.** We know that organic life, nutrition, circulation, excretion, secretion, motion, in fact all vital functions, can be carried on without the **cortex**—the outer rind of the hemispheres—of the brain; but that the manifestation of the intellectual and moral powers, the affections and propensities of self-preservation, cannot take place without it. Provided that the cortex of the brain be not affected, all the other portions of the system may be diseased, or separately destroyed—even the spinal cord may become affected—without the mental functions being impaired. Of course, if the heart, the medulla oblongata, or some other vital part be injured, death will precede any such experiment. If, on the other hand, the superficial grey matter of the brain becomes depressed, irritated, injured, or destroyed, the mental functions are partially or totally deranged or become wholly extinct. When the compression of the brain is removed, as in the case of an indented skull, or a tumour, or the extravasated blood or accumulated pus is evacuated, or the cerebral inflammation allayed, consciousness and the power of thought and feeling return.

We not only think but feel, rejoice and weep, love and hate, hope and fear, plan and destroy, trust and suspect, all through the agency of the brain cortex. Its cells record all the events, of whatever nature, which transpire within the sphere of existence of the individual, not merely the intellectual knowledge acquired, but likewise the emotions passed through and the passions indulged in. **It is therefore wrong to employ the word "mental" as meaning "intellect" only;** it should refer to all the powers and attributes of the mind—intellect, feelings, and primitive desires—character as well as intelligence.

We can only manifest our intellectual aptitudes, moral dispositions, and tendencies to self-preservation through the mechanism of the brain with which we happen to be endowed, and according to the sort of experience we have accumulated. Hence, though the primitive mental powers and fundamental anatomical parts of the brain of all men are the same, we all vary according to the mental predispositions and brain types we have inherited and the early education we received.

Of all the organs in the human body, the brain ranks highest in importance; yet, as we have seen, until about a century ago it received hardly any attention, and even at the present day the knowledge of its *mental* functions is still very obscure. It seems that the influence of antiquated metaphysics based on the results of self-introspection has not yet worn off entirely. For **mind is still regarded by some as if it consisted of intellect alone,** whereas we all *feel* and *strive*, as well as think, with our

brains. If it were not so, of what use would be the animal brain, as, for instance, that of the mouse, which has in proportion to the size of its body more brain than man (according to Wagner), and should therefore be more intellectual than any human being ?

Another remnant of metaphysical days is the view held by certain physiologists that all knowledge is derived from sensation. Whereas it is not the perfection of the senses which gives intelligence to the brain, but **it is the perfection of the brain which determines the employment of the senses.** The senses are perfected in childhood long before the structure of the brain is completed. The gradually increasing intelligence displayed throughout infancy and youth is due to a large extent to the completion of the cerebral organisation ; and talents are sometimes displayed in later years of which there was no suspicion during the process of education. Where the whole or parts of the brain remain arrested in their growth, education and experience are of no avail.

The cortex of the brain is the exclusive organ of the primordial psychic activities. I say "psychic activity" and not "mind," for I think it is a mistake to regard mind as an entity. It is too often described as if it laid a clutch, as it were, upon the brain, when it thinks, desires, or wills ; or were to use it as a complex tool or mechanism in thought and feeling, somewhat as senses and fingers avail themselves of a calculating machine or of a musical instrument. An entity remains always the same ; but if we regard mind as a "force" (see Chapter XXXIX.), we can understand that it varies in strength, that it can give energy to a weak part—by the concentration of suggestion or auto-suggestion—and we can understand that it is present in the whole and in every part of the body, owing to the close relation between brain and nervous system, and the latter being ramified throughout the body. We can understand how somatic conditions can influence psychical activity by influencing mind-force, but cannot create or destroy any of the primordial psychical activities, as influences acting directly on the brain cortex can. We can then understand that insanity may be due to toxic conditions in the bodily organs producing a degradation of function, without as yet producing a degradation of structure ; and why functional disturbances may be corrected while structural changes are hopeless.

The primary seat of mental disturbance is not always in the brain itself. The brain, by means of its nerves, is in direct or indirect connection with all the bodily organs. We know that bodily conditions will affect the nutrition of the brain and modify its functions. At one time all looks bright, cheerful, and encouraging ; at another time, not far distant, the same identical prospect looks cheerless, gloomy, and tinted with despair. This change depends upon physical conditions. When there exists a condition of good nutrition of the brain centres we experience a pleasant, agreeable sense of well-being. When the nutrition is imperfect the consequences are a mixture of irritability and bad temper, blended with depression. Hence it is possible that a brain intrinsically sound may show some morbid mental manifestations for the sole reason that the stimulations reaching it from other parts of the body are not normal. If the brain is really normal, such disturbances only arise with difficulty, or at any rate they pass away on cessation of the cause. Where the disturbances persist, there is always some weakness in the central organs.

One of the most necessary conditions for the proper manifestation of mental functions is that the brain should have **a regular supply of arterial blood.** The stoppage of one of the great arteries leading to this organ, either by compression in the neck, or by embolism at some point along its course, at once produces profound disturbances and even complete cessation of consciousness. It has been calculated that, while the weight of the entire encephalon is only about one forty-fifth of that of the body, the supply of blood used up there is not less than about one eighth of the whole supply. This expenditure is indicative of the large amount of work done

by the intra-cranial organ. It has also been shown that the **temperature** rises and falls in the whole cerebral area, or at particular circumscribed regions of the cortex, in close connection with the psychical activities.

To the man with **depressed circulation** the world seems sad, thinking requires an effort, movement is painful. To the man with an **accelerated circulation** the world and his own fate appear in rosy colours, and his capacities and possibilities seem to him infinite. His memory is active, he is continually planning and creating, and constantly on the move. In anæmia of the brain, as every attendant on the insane can observe, it is not only the thoughts that are slow, but there is less response to the affections, and the propensities are inactive. In engorgement of the brain we get hyper-activity, not only of all the intellectual powers, but also the sentiments and emotions, and the passions may be so active that restraint may become necessary. The individual manifestation will of course vary according to the natural character of the patient, but in all cases the natural characteristics will be more accentuated. This is **another proof** that the emotions and propensities, as well as the intellect, are dependent for their manifestation on the brain.

We know as yet so little of the mental functions of the brain that it is still a problem whether **optimism** and **pessimism** are due to peculiarities of the brain or due to bodily conditions. No doubt there are men who by nature are cheerful, hopeful, and enjoy being alive, however squalid their circumstances and mean their occupations; and there are others who, whatever may be their good fortune, are gloomy, depressed, seeing clouds in the brightest sunshine of life. These dispositions are said to be due to superabundance or deficiency of vital energy—but that this is not so, or, at least, not entirely so, is shown by those people who in sickness are still optimists, and, even when told of their approaching death, either refuse to believe it or hope for some miraculous help, or accept their fate stoically.

Optimism stimulates the activity of the vital organs; the pessimistic disposition slows the vital processes, slows the response to impressions from the external world, and disinclines the individual to make new adaptations to its environment. The bodily organs become sluggish and inert, except when temporarily animated by some physical agent or the stimulus of lively social intercourse.

Mental disturbances may also arise from excess or deficiency of the **secretions of certain glands**—for example, of the thyroid. Atrophy of the thyroid gland changes a normal child into a stunted and frightful cretinous idiot; on the other hand, hypertrophy and hyper-secretion of the same gland produces an over-emotional, restless, and unstable nature.

The influence of the constitution on the mental activity varies largely according as (1) the vital bodily organs, or (2) the bones and muscles, or (3) the brain and nervous system predominate. The first we can call the nutritive or vital; the second, the mechanical or motive; the third, the mental or nervous constitution. The man with the first says *I live and I enjoy;* the second says *I work and I execute;* and the third *I think and I plan.* The first manifests geniality, love of ease and domesticity; the second, industry, energy, self-reliance, force of character and endurance; the third originates, reflects, and refines, is sensitive and emotional, and attracted by intellectual pursuits. Few people are of such pronounced types; most men and women are more or less balanced. Still, there are a good many for whom this division holds good.

The brain is incontestably the **dominant organ of the body,** affecting all its tissues, controlling all its functions, and regulating all its energies. When any other organ is affected by disease it is, after all, merely a part of the man that suffers; when the cortex of the brain goes wrong in its mechanism it is the man himself that is affected. No instance has been found where an individual has manifested mental power without a brain. A diseased brain produces diseased manifestation. It appears that in some of the lower animals the psychical life is not inseparably

bound to the cerebral hemispheres; still, in the case of the higher mammals, and especially in the case of man, the connection undoubtedly exists.

Other things being equal, **the greatest amount of mental capacity and vigour (functional power) is allied with the largest quantum of cerebral substance.** All observation as regards men and animals proves that the energy of any nervous centre always bears a direct proportion to its bulk, whether absolute or relative. Every organ of our body increases in size in proportion as it is exercised within the limits of its physiological capacity, and this holds good as to the brain as well. With increased mental work—emotional as well as intellectual—the brain will show an increased growth. That is why in the insane the cranial capacity is greater than in the sane. (Measurements made by Amadei, Meynert, Obernier, Sommer, and Peli.)

The entire brain may be too small. Heads measuring eleven to thirteen inches in circumference and with a longitudinal diameter—from glabella (root of the nose) to occipital spine—of eight to nine inches, belong to the lowest class of idiots, where the intellectual manifestations are nil.

Heads with a circumference from fourteen to seventeen inches and a longitudinal measurement from eleven to twelve inches show glimpses of feeling and random intellectual perceptions, but without any power of attention or fixity of ideas. Heads of so small a size are accompanied by a greater or less degree of stupidity or fatuity, vague sentiments, indeterminate and transitory affections and passions, an irregular train of ideas, speech consisting of broken phrases, and blind and irregular instincts.

Heads of eighteen to nineteen inches in circumference are small, yet if well-balanced are not incompatible with the regular exercise of the intellect, which, however, is deficient in intensity. They indicate a pitiful mediocrity, a slavish spirit of imitation, credulity, superstition, that species of sensibility which by a trifle is raised to the height of joy, or plunged in an abyss of tears, a very fallible judgment, an extreme difficulty in discerning the relation of cause and effect, a want of self-control, and frequently, which is a happy circumstance, but few desires. With this degree of development, however, there may exist some marked mental aptitudes—such as a remarkable memory for figures, dates, music, etc., because some cerebral parts may be more fully developed.

As a rule, when the brain is too small, it is not dwarfed equally in all its parts, but is specially so in the pre-frontal regions—in those parts which manifest the peculiar human faculties and sentiments—while the hinder and lower parts of the brain—those which are the seats of the appetites and propensities—are far less affected; hence also the peculiarly animal look.

The average circumference of the head should be twenty-two inches. The measurement from the root of the nose to the occipital protuberance should be on the average fourteen inches. The brains of men who have distinguished themselves by their great talents are often larger, and those of feeble intellectual power smaller.

JOHN VENN and **FRANCIS GALTON** read a paper to the Anthropological Society, April 24th, 1888, on **Head Growth** in Students at the University of Cambridge, containing the following conclusions:

1. Although it is pretty well ascertained that in the masses of the population the brain ceases to grow after the age of nineteen, or even earlier, it is by no means so with University students.

2. That men who obtain high honours have considerably larger brains than others at the age of nineteen.

3. That they have larger brains than others, but not to the same extent, at the age of twenty-five; in fact, their predominance is by that time diminished to one-half of what it was.

4. Consequently "high honour" men are presumably, as a class, both more

precocious and more gifted throughout than others. We must therefore look upon eminent University success as a fortunate combination of these two helpful conditions.

The following figures of **HERMANN WELCKER** (1822-1897), of Halle, exhibit the cranial capacity in man at different ages, and consequently the progressive volume of his brain:

	Male. Cubic centimetres.	Female Cubic centimetres.
New-born infant	400	360
At two months	540	510
At one year	900	850
At three years	1080	1010
At ten years	1360	1250
From twenty to sixty years..	1450	1300

WEISBACH obtained the following weights of the brains of males between the ages of ten to ninety years, showing the **increase in the weight of the brain** up to middle age, and the decline of its mass in senility:

10-19 years of age,	1270	grammes
20-29	,,	1355	,,
30-59	,,	1375	,,
60-90	,,	1349	,,

The **average cubic capacity of the skull,** according to **MANOUVRIER,** is 1560 cubic centimetres in ordinary men and 1665 c.c. in eminent men; and, according to **BORDIER,** 1540 c.c. in murderers.

The following are the **skull capacities of some well-known men:**

Age 39....	Skobeleff, general	1457 c.c.	
,, 43....	Gambetta, statesman	1294 ,,	
,, 51....	Donizetti, musician	1391 ,,	(died of G.P.I.)
,, 53....	Thackeray, author	1644 ,,	
,, 54....	Descartes, philosopher.....	1700 ,,	
,, 56....	Broca, anthropologist	1485 ,,	
,, 56....	Dante, poet	1493 ,,	
,, 57....	Spurzheim, phrenologist	1559 ,,	
,, 59....	Dupuytren, surgeon.....	1436 ,,	
,, 62....	Bertillon, anthropologist.....	1398 ,,	
,, 63....	Cuvier, naturalist	1830 ,,	
,, 64....	Abercrombie, physician	1785 ,,	
,, 66....	Agassiz, naturalist	1512 ,,	
,, 70....	Liebig, chemist	1352 ,,	
,, 70....	Gall, anatomist	1692 ,,	
,, 70....	Petrarca, poet	1602 ,,	
,, 74....	La Fontaine, author	1950 ,,	
,, 75....	Grote, historian.....	1410 ,,	
,, 78....	Gauss, mathematician.....	1492 ,,	
,, 78....	Tiedemann, anatomist	1254 ,,	
,, 80....	Scarpa, surgeon	1455 ,,	
,, 82....	Volta, physicist.....	1745 ,,	

The orang and chimpanzee have cranial capacities of 26 and 27½ cubic inches respectively; while for normal man, the lowest cranial capacity is 55 cubic inches.

As to the weight, the gorilla's brain weighs 20 ounces, and those of the other anthropoids range from 12 to 16 ounces. But **the average weight of the civilised male**

brain is 49 ounces, of the female 44 ounces, while a weight of from 32 to 37 ounces is the minimum compatible with ordinary human intelligence, though idiot brains may sink as low as 10 ounces. The factor must not be overlooked that man's body-weight is about half the weight of the gorilla's body; which makes the difference in brain-weights more striking.

The following are the **brain-weights of some well-known men:**

Age 39....	Skobeleff	51·5 oz.
,, 44....	Gambetta	39 ,,
,, 46....	Schiller	63 ,,
,, 53....	Thackeray	58·5 ,,
,, 56....	Spurzheim	55 ,,
,, 56....	Dante	51·3 ,,
,, 58....	Dupuytren	50·7 ,,
,, 59....	Napoleon	57 ,,
,, 63....	Cuvier	64·5 ,,
,, 64....	Abercrombie.....	62·9 ,,
,, 67....	Chalmers	53 ,,
,, 70....	Daniel Webster	53·5 ,,
,, 70....	Gall	42·25 ,,
,, 75....	Grote	49·75 ,,
,, 78....	Gauss.....	52·6 ,,
,, 80....	Tiedemann	44·2 ,,
,, 80....	Grant.....	45·5 ,,

Of more recent brain-weights taken, the *lowest* recorded was that of *Ignaz von Döllinger*, the celebrated Catholic theologian, which weighed 1207 grammes, and the *heaviest* was that of *Turgenieff*, the Russian novelist, which was 2012 grammes.

How unreliable—without the fullest details—these brain-weights are, is shown by the careful weight taken of the brain of HELMHOLTZ, distinguished for his wonderful researches in optics. ("Zeitschrift für Psychiatrie," 1899). The weight of his brain, including the blood coagulum, was 1700 grammes. This being removed, the brain weighed 1540; but so much blood remained that it was estimated that 100-120 grammes should be deducted. This would reduce the brain-weight to 1420-1440 grammes. Helmholtz had therefore a brain not much above the average weight; but how do we know that in the cases of those very heavy brain-weights recorded allowance was made for the quantity of blood, as was made in the case of Helmholtz?

The brain of CUVIER remained for a long time the heaviest brain recorded of distinguished men. The weight was stated by WAGNER as 1861 grammes, but this BROCA corrected to 1829·96 grammes. Even thus reduced it exceeds the limits of the normal human brain by nearly one-third. The frontal lobes were abnormally large. He was an all-round genius. To SPITZKA, an eminent American neurologist, the explanation of Cuvier's heavy brain was very simple: it represented not intellect, but healed-up hydrocephalus. Celebrities with large heads will not feel flattered by this explanation. Science is rarely complimentary, but this is well-nigh libellous.

Lord BYRON died in Greece in 1824, and English papers reported his brain-weight as six medicinal pounds, a round figure which renders it suspect of being inaccurate. In any case it was probably a Neapolitan or Venetian weight, the former 1924 gr., the latter 1807 gr.; and it was stated that Byron's brain was in a hyperæmic condition, so that probably no allowance was made for the blood which the brain contained.

The use of different standards of weights and measures, and of diverse materials for determining the capacity of the skull in different countries, greatly complicates the researches of the craniologist.

CROMWELL'S brain is estimated at 78.8 oz., but must also be exaggerated, considering the size of the head in his portraits.

Sir WALTER SCOTT'S portraits show an astoundingly large head, especially in

height. The cranial arch from ear to ear measured from the mastoid process was 19 inches, whereas the average is only 14·6. The circumference of his head was 23·1 inches, the longitudinal diameter 9 inches, and the parietal 6·4 inches. Yet in the report of the post-mortem examination of Scott, the physicians stated that " the brain was not large." The peculiar shape of his skull was attributed to his lameness dating from his infancy—another healed-up hydrocephalus. But if, as his physician supposed, " the sagittal suture closed prematurely," his skull could never have achieved the enormous height.

On the discovery of DANTE'S remains at Ravenna in 1865, the skull was pronounced to be ample, and exquisite in form. But its actual cubical capacity and estimated brain-weight falls considerably below those of the heaviest brain-weights of distinguished men.

Size of brain is of course only *a* measure, and not *the* measure ; for a small brain but of superiority in texture, complexity of convolutions, and depth of sulci may equal a large one ; still, too much importance need not be attached to the frequent statement that the brain was rich in convolutions, for we know of no average in this respect. It is also a sad fact that many men, for lack of opportunity, are not in a position to use all the brain material at their disposal.

I have all my life observed living heads of all sorts and collected portraits of distinguished men of the past ; and I can confidently assert that no man with a small head is really great ; none such ever originated or led revolutions in science, letters, religion, or government ; or in any way stamped an image of himself on his country or age. Such an event would be as extraordinary and unnatural as the existence of gigantic muscular strength in the person of a dwarf. All history testifies to this. From Pericles, Aristotle, and Alexander, passing through the Cæsars, Ciceros, and Bacons, down to Napoleon, Fox, Bismarck, and Richard Wagner, every great conqueror, statesman, writer, or pioneer in any department has had a large head, **with predominating frontal region.**

Too much reliance is still placed on the now very old researches on the weights of brains made by RUDOLPH WAGNER (1805-1864), of Göttingen. He furnished by far the largest number known, and not many have been added since. He measured and weighed so many brains of renowned men, that a weight below the normal, *i.e.*, average, gave rise to the suspicion that the man was after all not so clever as was thought during his lifetime. This alarmed some of his renowned contemporaries so much, that they thereupon had a clause inserted in their wills, forbidding a post-mortem examination of their brains.

Few brain-weights are taken nowadays, and the old results are almost worthless ; for the number of weights taken were far too small and greatly wanting in details. Moreover, there is great variation in the size of the inch. For example, Gall means French inches, which are about one-sixteenth longer than the English. What we require is the weight of thousands of brains—of healthy, not of insane and diseased brains—each brain being weighed as a whole, and each part—frontal, parietal, temporal and occipital—according to an agreed anatomical division separately. It is of little value to know the weight of the brain of an eminent man without knowing the weights of the different parts. For, as is well known, the frontal lobes may be highly developed and the occipital lobes may be deficient ; in another brain of exactly the same weight the parietal lobes may be massive and the temporal lobes very small.

That the *entire* weight is misleading is shown in the case of the late Professor L. BISCHOFF (1807-1882), of Munich, who was one of the anatomists of Europe to defend the hypothesis of the mental inferiority of women against men, chiefly on the ground of the fact that he claimed to have observed that the average weight of a man's brain is 1350 grammes, but of a woman's only 1250. After his death the

post-mortem examination elicited the interesting fact that his own brain weighed only 1245 grammes.

The average weight of the brain of a European male, as has been already mentioned, is forty-nine ounces, and of the female forty-four ounces. This difference between the sexes is less marked in savage than in civilised races, and may be explained on the ground that in the lower races there is less difference in the education of the two sexes and the work done by them. *We want new measurements of female brains.* It would be interesting to observe, for example, what is the difference, if any, between the brain of a distinguished male and a distinguished female doctor of medicine. It must also be pointed out that the ordinary European averages of brain-weight are founded on the working classes, and generally not on the most successful members even of those classes. It is therefore not surprising that notable men should exceed the general average in brain-weight.

That the whole brain does not subserve only the intellectual functions is shown by the occurrence of emotional insanity and of certain systematised insanities and monomanias, in which the perception, memory and judgment remain unaffected. These affections can only be explained by disease of one part of the brain causing derangement of some of the intellectual capacities, while disease in another part may not disturb the intellect, but derange the moral powers or propensities. If the whole brain did subserve the intellectual functions, we should be unable to explain the idiot, whose brain is arrested in growth. He should be incapable of manifesting any emotion ; whereas, on the contrary, his emotions are manifested all the more strongly for lack of the inhibitory control of reason. The intellect can only appreciate facts ; it does not supply motives. We act from affection, and think in order to act. The world is governed not by thought but by emotion, and in judging a man we have to ask what are the motives that habitually determine his conduct whatever may be the means his intellect devises for the attainment of his ends.

Size of head indicates mental power but does not tell us whether that power lies in extent of intellect, in strength of moral feeling, or in power of passion or affection. We repeat again that the cortex of the brain records all the events, of whatever nature, which transpire within the sphere of existence of the individual, not merely as concerns the intellectual knowledge acquired, but likewise the emotions passed through and the passions indulged in. Most men utterly disregard this distinction. They confound intellectual power, moral feeling, and brute propensity, and treat the brain as if it consisted only of one lobe with only one function, namely, the manifestation of intellect. Thus TIEDEMANN inferred, and Sir WILLIAM HAMILTON concurred with him, that because the negro brain is equal in weight to the European, therefore the negro is also his equal in intellectual power.

Comparisons are frequently made between European and savage brains, but such comparisons to be of value should be made between savage brains and those of unskilled workmen or vagrants ; for the educated man has the advantage of the accumulated knowledge and civilisation in general.

After all, it is very doubtful whether the great mass of men in our day exercise so much more complicated mental functions than the savages. Those who invent nothing, improve nothing, and, confined to their trade, swim with the great stream of imitators, understand only a small part of the manifold machinery of modern civilisation. The locomotive and the telegraph, the prediction of eclipses in the almanac, and the existence of great libraries with hundreds of thousands of books are taken for granted by them, and do not trouble them any farther. Whether now, with the rigid division of labour running ever into higher social positions, the functions of such a passive member of modern society are much higher than those of the native of Africa or Australia may be very much doubted, especially as the latter are undervalued.

On the other hand, there is a probability that many of the present tribes of savages are, in point of civilisation, in a more degenerate condition than their forefathers, who acquired originally higher mental qualities under natural selection. And, if such be the case, we naturally expect to find some stray races with inherited brains of greater capacity than their needs, in more degenerate circumstances, may require. An exact equivalent to this may be seen in the feeble intellectuality of many of the peasants and lower classes among the civilised nations of modern times. The capacity is there, but latent. Hence it happens not unfrequently that a youth born of such parents, if educated, becomes a distinguished citizen.

Similar remarks are applicable to the skulls of prehistoric races, as it would appear that evolution had done the major part of its work in brain development long before the days of neolithic civilisation. Some of the skulls of fossil men are of large size, but chiefly in the posterior region. It would seem that the growth of the frontal region of the brain diminished the posterior development. **Until localisation of brain functions makes greater progress it is futile to speculate,** to any great extent, on the relative sizes of skulls of different races, either in present or prehistoric times.

Owing to the ignorance of the fact that **the primary emotions and propensities are as much related to the brain as the intellect,** weights and measurements are taken to this day—as we have seen—of the entire brain and deductions drawn as to the intellectual capacity of the individual. The evidence of comparative anatomy is entirely overlooked, that we have some parts of the brain in common with animals, to administer to our animal wants, and that only those parts which are characteristically human can have any relation to the higher intellectual processes and moral powers for which man is distinguished.

Prof. **KARL PEARSON,** in a paper read before the Royal Society on January 23rd, 1902, endeavoured to show that there is no correlation of intellectual ability with the size of the *entire* head. This is obvious, for the purely intellectual functions, as we shall produce evidence presently, are confined to the frontal, or rather the pre-frontal, region of the cortex, which is at best one-third of the entire mass of the brain.

Prof. **C. S. SHERRINGTON** (*Lecture on Physiology for Teachers*, London, 1901) is therefore also quite correct in his observation that the brain may be wide or narrow, deep or flattened, the shape of the *entire* mass will not give any clue to the intellectual endowment of its former possessor.

No matter whether the head be large or small, and the brain heavy or light, the entire mass will give no clue to the intellectual ability or moral character of the individual. We must compare the relative development of different regions in the same brain to come to a conclusion.

Circumference alone, as a measure of the skull and its contents, is inadequate; for the brain may grow in certain regions without affecting the circumferential measurement. Thus I have three female adult skulls in my collection, each one has the circumference of 524 millimetres, *i.e.*, 20·6 inches, but the cubic capacity of

No. 1 is 1390 cubic centimetres
No. 2 ,, 1550 ,, ,,
No. 3 ,, 1420 ,, ,,

which shows a difference between skull No. 1 and skull No. 2 of 160 cubic centimetres, or 11·5 per cent. This shows that we want to weigh each lobe separately, and even definite segments of each lobe.

A high development of a particular region as compared to the rest of the brain is generally associated with special mental powers of which the region in question is the essential basis; just as in animals that possess an extraordinary sense of smell there is a relatively large development of the olfactory bulbs.

Men are born with intellects or understandings which differ materially from each

other, so that there are particular kinds of understandings as there are of instincts among the animals, and we must conclude that **each kind of understanding has a particular instrument for its manifestation.**

The difference in the mental powers of members of the same family arises wholly from the various degrees of development in the different cerebral parts. All normal human brains exhibit the same parts and have the same primary mental powers, but vary in the relative development of the different convolutions, principal and accessory. This relation is infinitely varied, hence the great variety in the character of men and the different degrees of development of the primitive mental powers in the same individual.

Each individual comes into the world with a varying potentiality of development, and with an innate tendency for that development to take place more readily along certain lines than along others. There is not the slightest doubt that the innate developmental capacity of the brain cells varies greatly in different individuals. In some the potentiality is very great, in others it is comparatively small. This seems to be particularly the case with certain regions of the brain, and in consequence we have striking differences in family aptitudes.

There are some families the members of which evince a marked predilection for intellectual pursuits ; there are others of which the members are born soldiers or travellers, and there are others with a special head for mechanical work of some kind or other, and with but little proclivity for book study. These differences are clearly inherited.

Of course, environment exerts a considerable influence, but environment cannot supply faculty of which the rudiment is non-existent, nor can it modify to any great extent the course of inherited tendencies. These things it cannot do, but it can certainly afford or withhold the opportunity for the development of those tendencies. The environment can, in short, encourage or discourage mental evolution.

Quality of brain does not account for these differences ; for, as a rule, all the parts of the same brain have the same quality. But if we compare two brains, we must recollect that their size may be equal, and that nevertheless the one, from possessing the finer texture and its owner having a more vigorous bodily constitution, may be active and energetic, while the other, from being inferior in quality, or its owner having a different kind of temperament or feebler constitution, is naturally inert.

Another explanation put forward is that the differences obtaining in the weight of brains are due wholly to differences in the **bulk of the body.** This argument has been disposed of by Sir **WILLIAM TURNER** (1832-1916), who said :

" The human brain, in all probability, attains its full size and weight at or about the age of thirty, whilst the body not only increases in weight after this period, but in one and the same individual may vary considerably in weight at different stages of adult life, without any corresponding fluctuations taking place in the weight of the brain."

Small heads are rare with tall men, while large heads are very common with little men. **When large heads show small intellectual capacity, we must look for power in the emotions and propensities.** Some big-headed men are little more than big animals ; they may manifest considerable mental power, particularly in the directions of the feelings and passions, though little intellectual. On the other hand, there are multitudes of comparatively small-headed men who display an almost unquenchable thirst for knowledge, an aptitude to acquire it, and a disposition to make right use of it ; such small heads consist almost entirely of frontal brain—the region which we shall prove to be connected with intellectual functions.

Many men possess not general intelligence, but a special intelligence, which

makes them successful; accordingly they may have small brains, well developed only in one or a group of centres, and not heads large all round. Specialists' brains are often small—too small for their possessors' judgments to be trustworthy except in their narrow speciality, and often not even in that. EDINGER, in his "Anatomy of the Nervous System," showed that special ability, as in certain great men, commanders, business men, etc., is not due so much to big brains as to the development of special parts.

Again, the logical faculty of reasoning may be highly developed in a small brain and its possessor be a very great man. This type of man is often unable to take any special part in the orchestration of civilisation, but as leaders to direct and harmonise the efforts of other specialists they may be superb. We all know plodding successful specialists of extremely limited mental horizon, scientific investigators too narrow to interpret their own results and discoveries, philosophers who have no idea of number, mathematicians who are unable to talk, statesmen without business sense, men ignorant of the existence of Shakespeare yet possessed of executive ability enabling them to manage vast affairs, while men noted in other respects may be so devoid of executive ability as to bungle everything they attempt to manage. Practically we have every possible grade between degenerate imbeciles like "Blind Tom," with but one developed faculty, and those having many faculties developed, the equally impracticable "Admirable Crichtons."

Mind and consciousness are bound up with a brain in us; but just as in the lower creatures there is digestion without a stomach, so there is consciousness without a brain. Only, in proportion as the organism becomes more perfect, a division of labour is brought about: special organs are destined to diverse functions instead of the whole mass doing all. But the function was previously performed in the undifferentiated organism; it was performed all over it, though with less precision.

It is astonishing that there should still be men existing who pin their faith to the belief that the brain acts always as a whole whatever the mental function—that the same structure acts in anger, fear, æsthetic emotion, love, scientific observation and metaphysical thought. Those who hold that belief might as well say that the same aggregate of brain-cells is engaged in the function of seeing, hearing, and smelling; but they do not go so far because they know it is not true. The olfactory lobes, for one, are so distinct that they must be acknowledged. But why, if we admit different regions for the various senses, should we not admit that the primordial activities of the soul should have separate instruments in the brain, though so closely interwoven by a network of fibres that the action of one will set the others into vibration? The discovery of anatomically distinct areas in the brain by BRODMANN and ELLIOT SMITH would point to such an interpretation.

There is nothing unreasonable in the supposition that an indivisible soul may have the power of seeing, hearing, reflecting, and manifesting various primitive feelings through the medium of a complex brain. **Those who do not admit the plurality of centres are thrown back on assuming a compound soul or mind acting through a simple brain;** or on assuming that the soul, with its emotions, passions, judgment, and the senses, acts independently of the brain, and is divisible though immaterial.

Some metaphysicians get out of their difficulty by explaining that the various mental powers are only particular modes of action: "The mind itself existing in certain states" (Dr. Thomas Brown). That is, a constantly changing mind—the mind in a state of anger, love, fear, observation, reflection, imagination, etc., dancing out of one state into another. Is such an idea consistent with our experience? Others make a great deal of the consciousness of personal identity, but ignore the cases of dissociation of personality. In a state of health man is conscious of his own identity; but when labouring under disease, consciousness is frequently disturbed or even lost. **If the psychical activities are independent of definite and separate**

Instruments we cannot understand insanity. We cannot admit a *mind disease*, and still less that portions of our psyche should be diseased while the remainder remains healthy. But insanity can be readily understood if we admit that certain areas of the brain, through which mind acts, are in a disordered or diseased condition, while the remainder is still normal.

There is no mental unity even in the ordinary healthy conditions. There is not a man in the world whose memory is equally good on every subject and the same at all times. How can a spiritual unity be strong on one point and weak on another ? Just imagine a spirit becoming imbecile, weak, tired, and exhausted ! May we not conclude, then, that each mental manifestation takes place through a special and appropriate organ, and that the brain consequently consists of a congeries of centres for the manifestation of the various psychical activities, or rudiments of those activities ?

By assuming that the mental powers of perception, deduction and induction require separate mechanisms of brain-cells, I do not destroy the psychical nature of the soul ; on the contrary, I prove that the products of perception and thought are unlimited and purely spiritual. No one will assert that if I recall in my mind a mountain scene, or create a vision of a machine, that these things are physical. They have no actual existence ; but as I have an eye for seeing and an ear for hearing, so I must have some mechanism for the elementary psychical processes, without which the perception and creation of these things is impossible. Even to conceive the Power of an Almighty and to be able to render devotion to Him I must have some brain elements to get into that condition ; for where these elements are lacking, as in arrested brain growth of idiocy, or where they are destroyed through brain injury, that power may never exist or be lost, and the individual be reduced to an animal state.

Long-continued mental application does not fatigue all the mental powers in an equal degree. Rest can be obtained by a change of object. This would be an impossibility if the whole brain were engaged in each mental exertion.

Take, furthermore, the phenomena of **dreaming.** During that state several of the mental faculties, moral, affective, as well as intellectual, are evidently active, while the remainder continue dormant. The natural result of such an arrangement is that we sometimes imagine ourselves engaged in actions which, in our waking moments, we should never have undertaken, because in the latter state our decision would have been influenced by feelings and faculties that in our dream-moments were asleep.

It has already been pointed out that in **partial idiocy** the individual is exceedingly deficient in most of the intellectual powers, and yet may possess a few of them in considerable vigour. Thus an idiot may have a talent for imitation, for drawing, or for music, and be incapable of comprehending a single abstract idea ; or he may show a hoarding inclination, a destructive tendency, or some special instinct in high activity, and yet manifest no other power to any perceptible extent. Were the brain a single organ, then the innate dispositions of each man would be similar. But if there be special aggregates of brain-cells appropriated to different mental powers, then does every modification of intellect and character depend in its elements on a different degree of development attained by these particular parts of the brain, and their varying degree of activity. There are no two brains alike in their configuration, nor are the mental dispositions of any two individuals found exactly to correspond.

Moreover, the existence of such evidence as that of **injuries of the head** affecting, not unfrequently, one or more of the mental powers, while others remain perfectly sound, has appeared to not a few physiologists to render the supposition far from unreasonable that the different portions of the cerebral hemispheres have different functions allotted to them. A large number of cases have been placed on record

by independent observers, in which some special mental quality or primary feeling, deranged owing to circumscribed lesion of the brain, has returned to normal activity when the source of irritation has been removed (see Chapters XXIX.-XXXII.). True, now and then we hear that destruction of the grey matter of the brain may occur without any mental change in the patient. But such statements are made by men who have no method in their observation of intellectual changes, and who disregard entirely the alterations in the feelings and emotions of the patient, believing them to be independent of the activities of the brain.

Just as the brains of animals differ in accordance with the strength of a particular sense which is peculiar to them—one with a superior smell having large olfactory lobes—so it is not unreasonable to assume that **animal brains differ in accordance with the special instincts which they manifest**; and, indeed, if we compare the brains of the different species we see essential differences in the form, size, and shape of their brains, and the form and number of their convolutions. Even the individuals of each species, notably of domestic animals, show often essential differences in abilities and dispositions; for instance, not every breed of dogs could be made into sporting dogs, consequently some essential element in their brain must also vary. We make distinctions also between the skulls of different races, and of different nationalities, and the brains differ also. But, if that is the case, the different regions of the brain must vary in their function.

Vision may be in a morbid condition and hearing sound; or hearing may be disordered and vision sound. Of the other external senses the same is true. They are so independent of each other that either of them may be sound or unsound singly. **They have their real seat in different portions of the brain.** Vision is not seated in the eye, hearing in the ear, taste in the tongue, smelling in the nostrils, nor touch in the fingers, neither are they seated in the nerves of those organs. The eye, ear, tongue, nose, and fingers are but the externals of the senses, and the functions of these organs are as different as the functions of the nerves they receive, for each organ must be in harmony with its own nerves. This fact alone proves the brain to be a compound viscus. In confirmation of the view here taken, it is well known that blindness, deafness, and an extinction of the other external senses, often depend not on any diseased condition of the external or intermediate apparatus, but on a morbid affection of the brain.

When we direct our attention to the lower order of animals, we perceive an accurate correspondence between their brains and mentality. When we find the brain with few convolutions, the animal has few faculties. As we ascend through the higher grades of animals, brain matter and mentality increase in complexity alike, until we rise to man, who has the most complex brain, as well as the most complete mental manifestation. This is well known to comparative anatomists and to all naturalists. The human brain contains many convolutions not found in the brain of any other animal; and human mentality consists of several powers exclusively its own, the supernumerary convolutions and the supernumerary faculties corresponding.

Moreover, **different parts of the brain are not developed simultaneously**; but those whose functions are earlier called into action have their fibres earlier developed. Similarly, the various mental powers appear, some at an earlier, some at a later, period. Further, in the same individual, certain propensities, sentiments, and intellectual faculties are manifested with great energy, while others scarcely appear. One may excel in verbal memory, and be incapable of combining two philosophical ideas; another may be a great painter, and a bad musician, or a miserable poet; and a third a great poet, but a bad general. Everyone has peculiar gifts. Hence the same mass of brain cannot preside over dissimilar functions. It is evident, therefore, that the brain must have different centres to account for the great variety in the natural capacities and emotional dispositions.

How can a capacity, say, for music, or a disposition to excessive irascibility, be inherited if these are purely psychical tendencies independent of any material organisation for their elements? But we can explain hereditary mental dispositions by assuming the inherited instrument to be perfect or imperfect.

If there were no special centres, how could the transmission of peculiarities of character from parent to child be explained? Peculiarities of character are no more than modes of faculties, and they could not be transmitted unless we had also a peculiarity of structure in the organ. The mental qualities of the parent may be transmitted to the offspring, either immediate or remote, in an identical or an allied form. Every fundamental attribute of the parent tends to be inherited by the offspring. This is the first and most fundamental law of heredity. But how can mental characteristics be inherited unless there is some physical characteristic corresponding with it? Those who deny the possibility of different nerve-cells having different functions must, therefore, first explain the heredity of mental characteristics.

It has been said that the exceptional talents and characteristics of some men are due to accidental causes; as, for instance, Demosthenes is said to have become eloquent because he was attracted by the eloquence of Callisthenes. But many heard Callisthenes who did not become eloquent; and Demosthenes differed from them by a predisposition to oratory sufficiently strong to make him take the trouble to acquire the necessary skill. All that external impressions can do is to give an impulse to talents which have not been exercised before; the disposition for such activity must already exist. We must bear in mind that the same opportunity is offered to a great many men, whilst only one is inspired. As FRANCIS GALTON has pointed out, education and surrounding circumstances are only powerful on those men whose innate dispositions are neither too feeble nor too energetic. Even the men of mediocrity have their individual character. There is something in every man which resists all educationary efforts, as every teacher will know.

Last, but not least, we have the observations of numerous investigators showing that **certain regions of the cerebrum are distinguished from other regions by broad differences in structure.** Not only does the structure in different convolutions assume to a greater or less extent a variety of modifications, but even different parts of the same convolution may vary with regard either to the arrangement or the relative size of their cells. These structural differences must be correlated with some difference of function. The group of cells whose function is purely intellectual cannot possibly have the same construction as a group of cells whose function is purely emotional. The two may be united by association fibres, so that one may rouse the other, but the function of each group of cells must be distinct.

This conception of centres would alter none of our known psychological facts. For, as we have already explained, that although we may for the present, not knowing better, localise complex mental functions, it is really only the *element* of each function that can have a separate centre or instrument—only every primary process of intellect, feeling, or impulse. Let me repeat, that just as we require an eye to see, but cannot tell what the eye will see, so we cannot tell what use the person endowed with the colour sense, or a sense of tone, or his apparatus for anger, love, or fear, will make. Just as sight and hearing are roused spontaneously on stimulation of the eyes or ears and their brain centres, so are the brain centres for the primary emotions roused on the requisite stimulus, to a different degree according to the force of the stimulus and the perfection of the particular centre. Science can only say: **You cannot have a primary capacity, emotion, or propensity without the agency of certain brain-cells**—which are live cells, and not a material apparatus, it is to be remembered—just as little as you can have music without musical instruments. The fact that instruments are necessary for music does not alter anything in the psychology of music; nor is anything altered by the assertion that you

cannot feel angry without a certain group of cells in the cortex being set into activity.

Admitting this theory, we can understand why a nervous discharge—as takes place, for instance, when the emotion of fear is aroused—being connected always with a given group of brain-cells, subsequent discharges take place along the same routes and become easier the oftener they are repeated. The more frequently a person allows himself to be frightened, the more timid he will become, for the nervous action becomes facilitated, and it will be more difficult for him to resist it. We may commence by stealing a pin, we may learn to steal a sovereign, and end by being unable altogether to resist thieving.

The brain centres do not contain ideas, but they possess the mechanism to compose ideas. Therefore we cannot say that a person with a certain brain formation is, for example, musical, but only that he has certain brain areas for the appreciation of tone, time, and harmony so perfectly developed that the instruments are there which, given favourable circumstances, would make him easily develop musical ability.

The sensory centres are not the centres for intellectual activity, for knowledge does not depend on sensation alone. **What sensation does is to rouse the mechanism of the brain centres for the primordial dispositions to activity,** according to their relative development and associative arrangement. That is how the sight of, for example, a wood strikes the poet and timber merchant differently, and the hearing of the same sentence evokes different response in different individuals. These primary centres are for unconscious mental dispositions of ancestral inheritance (as we have already pointed out in Chapter XXV.), and their conscious control is a matter of education.

The more primitive the brain organisation, as in the lower animals, the more is the response to sensations like reflex action; and the more organised the brain, the greater the control over the response.

Another fact is that the primary propensities for self-preservation respond more impulsively than the higher powers by the rousing of the primitive emotions (fear, anger, etc.).

Again, the response by a centre to sensation is the quicker the more developed the particular centre, and the higher the quality. Furthermore, congestion produces greater activity than anæmia. Maniacal patients, therefore, react quickly to impressions; whereas melancholics respond slowly, if at all.

The emotions and propensities depend upon the brain organisation as much as do the intellectual capacities. Common sense tells us that the intellect and feelings are so essentially different that there must be separate centres for them. No one can suppose that the same bundle of nerve-cells and nerve-fibres which is employed in intellectual effort is that through which the emotions are manifested. The feelings of anger, fear, love, and grief arise spontaneously in us, and are as vivid the first time we feel them as they are after being often repeated.

We find children show different dispositions to fear, anger, love, etc., in different degrees long before they had any experience and quite independent of intellectual influences, and we find sometimes that all the training fails in curbing the natural inclinations. If we do not admit that they are due to peculiarities of brain organisation, it will be difficult to explain them. We shall have to assume that all character is due to education and experience, in which case no reliance could be placed on the actions of men. Education, experience, and external influences in general, may draw out the inherited dispositions and may alter them, refine them, but they cannot create them. Education can act only in proportion to the degree of development of the innate mental powers. It can sharpen existing aptitudes and dispositions, but cannot supply new ones. **The character tendencies, like the intellectual capacities, are predetermined,** and this is the reason why so frequently—to use the words of Sir FRANCIS GALTON—"a son, happening to inherit somewhat

exclusively the qualities of his father, will fail with his failures, sin with his sins, surmount with his virtues, and generally get through life in much the same way." But **tendencies are of course not "actualities,"** and the growth of character is subjected to such a variety of influences that the ultimate constitution may differ considerably from the original disposition.

We do not feel sorry because we cry, as JAMES contended, but we cry because, when we are sorry, or overjoyed, or violently angry, or full of tender affection—when any one of these diverse emotional states is present—there are nervous discharges by sympathetic channels to various viscera, including the lachrymal glands.

This view that **emotions are not of visceral origin** is in accord with the experimental results of **SHERRINGTON,** who has demonstrated that emotional responses occur in dogs in which practically all the main viscera and the great bulk of skeletal muscle have been removed from subjection to and from influence upon the brain by severance of the vagus nerves and the spinal cord. In these animals no alteration whatever was noticed in the occurrence, under appropriate circumstances, of expressions of voice and features, indicating anger, delight, or fear. The argument that these expressions may have been previously established by afferent impulses from excited viscera was met by noting that a puppy only nine weeks old also continued to exhibit the signs of affective states after the brain was disconnected from all the body except head and shoulders. Evidence from uniformity of visceral response—and evidence from exclusion of the viscera—are harmonious, therefore, in pointing towards central rather than peripheral changes as the source of differences in emotional states.

The intellect and the emotions must be related to different parts of the brain, otherwise it would be difficult to account for the fact why there so often exists **a wide difference in the same individual between the moral character and the intellectual capacity,** and why **in lesions of the brain the conduct may become altered while the intellect remains unaffected.** If the feelings and propensities are not related to the brain, we should fail to account for the fact that in brain lesions they become changed—the religious man becomes irreligious, the benevolent man hard and cruel, the affectionate man neglectful of his family ties and obligations, the amiable and even-tempered man irascible without provocation, and so on. When a man goes mad, the primary disorder usually consists of a lack of control over his feelings, which affect the course of his thought and consequently of action, without disordering the reasoning processes in any other way than by supplying him with wrong materials.

"It will not be denied," says **RAY** ("Jurisprudence of Insanity," p. 163), "that the propensities and sentiments are also integral portions of our mental constitution, and no enlightened physiologist can doubt their manifestations are also liable with the organism to derangement and disease. That a man may be morally insane with intellect unimpaired is a position that may now fairly be assumed without question."

Yet according to **HÖFFDING** ("Outlines of Psychology," 1891, p. 349), "both talent and character are determined by the temperament." (!)

That the primary emotions must have their separate centres in the brain is shown by their **effects.** Fear, sorrow, and depressing emotions in general lower the muscular innervation, constrict the arteries, slow speech, slacken the association of ideas, and lower the vital functions; whereas joy and anger increase the muscular innervation, dilate the arteries, and increase the volubility of speech and the general energy. Further and more convincing proofs will be found in the succeeding chapters, where we deal with each emotion separately. The number of cases we shall cite there, accurately observed and recorded, in which injury of the brain affected one particular emotion or propensity, according to the locality on which it

was inflicted, while in other respects the individual remained perfectly sound, can only be explained on the principle that the several portions of the several hemispheres have different functions allotted to them.

Meanwhile attention must be drawn to the fact that it is through the sympathetic nervous system that **every bodily function can be affected by an emotion,** and *vice versa.*

The brain, besides being the organ of mind, is also the great regulator of all the functions of the body, the ever-active controller of every organ. For this purpose it has a double set of nerves; firstly, the *cerebro-spinal* nerves, which in the normal state are more or less under voluntary control, enabling us to move our muscles and limbs; and, secondly, the so-called *sympathetic* nerves, which are not under our voluntary dominion. The latter go to our internal organs and to the arteries, controlling the local blood-supply and thus nutrition, and also to the spinal nerves, thus exerting a brain control over our intentional movements. In this manner—and this is only a rough outline—all organs and all functions are represented in the brain, and are so represented that all may be brought into the right relationship and harmony with each other and converted into a vital unity. Thus mind, motion, sensibility, nutrition, repair and drainage have their governing centres in the brain.

Thus **certain states of mind are apt to be accompanied by various derangements of the functions of the body.** Everyone knows how the receipt of an unpleasant letter may make us lose all appetite for food, and even cause us indigestion or headache; how fear may actually paralyse the muscles and keep us "rooted to the spot"; how sudden shock will sometimes result in instant death; how long-continued grief or mental strain will sap the strength of the body. And it is no less a fact of observation that when healthy mental states are substituted for unhealthy ones, the functional derangements of the body tend to disappear again.

On the other hand, it is owing to the same organisation that **our mental disposition can be influenced by the bodily functions.** Nobody is constantly the same self. Not only is he a different self at different periods of his life and in different circumstances, but also on different days, according to his different bodily states: sanguine and optimistic, gloomy and pessimistic, frank and genial, reserved and suspicious, apathetic or energetic. Although his intellectual powers remain the same, his judgment of the objective world and his relations to it are quite changed, because of the change in his moods and in the bodily states which they imply.

The subtle working of the sympathetic nerves may be witnessed by anyone in the habit of making physiognomical observations. He will see the flush of sudden anger, the pallor of sudden fear, the damask hue of overtaxed modesty, and the deeper tint of actual shame, the quasi-electric glow (in both cheek and eye) of radiant hope, the jaundiced hue of malignant jealousy, and the ashen bloom of suppressed (and postponed) vengeance. Each of these circulatory changes is a visible sign of the working of the mind through the sympathetic system; but the internal and invisible effects are much more powerful and quicken or retard practically every bodily process.

Without giving any further illustrations, it will be admitted that there is ample evidence of the **interaction between mind and body,** *i.e.*, of the physical effects of mental causes and the mental effects of physical causes. We need not go into details, so long as it is admitted that not only can the body be weakened through the agency of the mind, but it can be strengthened also by that same agency.

If the emotions and propensities arise previous to experience and vary in degree according to the inherited predisposition, they must have their brain centres from which they originate, the same as the intellectual capacities have. But this is an assumption which is still most emphatically denied. The statement will be supported presently with abundant evidence; but first let us examine the reasons for its non-acceptance.

First of all, to make trustworthy observations on this subject we must be both

physicians and psychologists; but seldom indeed are the two combined. The mind is regarded as the province of the psychologist, who as a graduate in philosophy knows nothing of the brain, or has only second-hand knowledge which renders him apt to accept *whatever brain theory happens to be in fashion at the moment*, and to speculate on the same, while the brain is turned over to the anatomist, physiologist, or pathologist, *i.e.*, to the doctors of medicine, who not infrequently know little of the mind and its elements.

The view that the emotions and propensities have their centres in the brain independent of the intellectual centres is opposed by modern brain physiologists principally on the ground that the emotions are all-pervading, affecting the whole body and exercising their influence over the entire brain—over every idea. This statement is quite correct, only it does not disprove our theory. Each emotion gives an impulse to the brain different in kind, and, if there be anything like order, must travel along different nerve paths, and though the effect of such an impulse may be an all-pervading one, there must be a centre from which the impulse starts. We might as well say that Bright's disease is a disease of the whole body, and not of the kidneys, because a great many parts of the organism may be affected by it.

Thus, **GEO. W. CRILE,** Professor of Surgery, in an admirable study of "The Origin and Nature of the Emotions" (Philadelphia and London, 1915), starts from the point of view that the emotions affect the whole brain, whatever their kind. He gives a *mechanistic* explanation and holds nurture, not nature, to be the originator, maintaining "not that man is in *large measure* the product of his environment, but that environment has been the actual *creator* of man."

Another objection is that each idea appears to have its own emotion. This objection arises from ignorance of what are the primary emotions. Sensations and ideas arouse feelings, which may occur simultaneously with them, but they are not the feelings. On the contrary, it would be truer to say that every emotion is accompanied by an idea, for the feeling arises first and we seek for a cause.

The sight of cruelty arouses a feeling in us just as surely as does the sensation of pain inflicted upon our bodies. We cannot infer that the feeling aroused by seeing another suffer comes to our mind through the channels of visual sensation or even visceral sensation, else why should not the same sight always produce the same effect upon us? Instead of the same feeling, we find a bewildering variety, ranging from fear and horror to compassion and resentment.

Any idea may exist associated with almost any emotional state; it may also exist without the co-existence of any emotional state. Any simple emotional state, as fear or anger, may exist without being associated with any idea, without the simultaneous existence of any thought. A man may not be afraid; the individual simply suffers from fear, not from fear of something. Moreover, there is no relation between the intensity of emotional and intellectual action going on at the same time, as we should think must necessarily be the case if these two were functions of one and the same part of the brain. In any given individual the intellect may be highly developed and the emotions very ill developed, or the reverse.

True, we cannot recall feelings as we can intellectual experiences. For example, feeling happy is not the same as having the idea of happiness. Still, if it can be shown that injury of one part of the brain is followed by undue manifestation of anger, and that of another part by excessive fear without adequate cause or without any cause (see cases in succeeding chapters), the connection between certain fundamental feelings and definite portions of the brain must be admitted.

Another objection is that the emotional parts of the mind cannot be so divorced in operation from the intellectual that the one can become insane, the other remaining perfectly sane. But that is exactly what is the case.

For example, in the early stage of *melancholia* there is a vague anxiety that

cannot be accounted for by the patient, who is quite free from delusions, and observes and reasons quite clearly. His mental machine—his thoughts and actions —will work more slowly in this condition, but quite correctly. In the next stage he will try to find some reason for his indefinite fears that make him feel so miserable, and he then may exaggerate some mistakes he made in his earlier life, of which in his health he has taken little or no notice, and may put down the cause of his depression to them ; but he is still inventing nothing. He did make the mistakes, though they are not of such importance as to cause so much and so persistent an anxiety.

In *paranoia* also we get in the early stages a purely emotional change consisting of an exaggerated feeling of suspicion. In trying to seek evidence for it, the patient will misinterpret the looks and actions of people whom he meets, but he does not reason incorrectly, only his suspicion supplies him with wrong facts, just as it does in the case of a jealous person. He will do his work, at this stage at all events, as well as ever, and it is only when we touch upon the subject or object of his suspicion that we can notice something wrong with him.

Another argument against our view—rather old, but again revived—is that the source of our feelings is to be sought in the activity of the visceral functions. With this objection we have dealt already, and need only mention here that the viscera may cause slight alterations, or, rather, accentuations, in our feelings, but they do not create them ; for perfectly healthy persons may all their life be possessed by undue fear, making them cautious and prudent in all their actions, and others may experience the emotion of anger more frequently or more strongly, giving them force in opposition, indignation at affronts, and energy in execution of their plans. **We all differ in our primary emotions quite independently of the state of the viscera.**

The question, however, is not so much whether specific emotions originate in a limited brain area, but **whether the fundamental propensities**—the original instincts of animals and man—**are connected with the brain or not.** This question seems never to occur to physiologists and brain surgeons. It is always the intellect and its metaphysical elements that are inquired into ; but, surely, if any mental qualities are related to the brain, it is those elementary instincts which are common to all animal creation for the preservation of their existence. Otherwise of what use is their brain ? It is positively wearisome to go through thousands of reports of cases of head injuries, brain tumours, and other lesions affecting the cerebrum and read invariably that the symptoms observed were " mental depression," " restlessness," " diminished attention," or " loss of concentration " or of " memory." Such vague statements can be made of any person, whether suffering from a cold in the head or pain in the big toe, and need no cerebral lesion. The vast number of cases which I shall quote in the next three chapters may not all be suitable cases to prove my arguments, but they are the average that can be found in medical literature for the present, and all that is intended with them is **to give an impetus to an inquiry into the whole problem on new lines.**

Then there are those who oppose not only the view that the primary emotions and propensities have their origin in special centres of the brain, but **oppose all localisation whatsoever.** Most of them are still imbued with the metaphysical notion of the unity of the *ego*. But do not the bodily organs—the heart, the lungs, the stomach, and the kidneys—work simultaneously ? Why should not the different brain centres, which are also organs for specific functions, work simultaneously in their respective departments ? Consciousness is only a phase of that nervous work.

We read a book which excites our imagination. The printed words and sentences are observed. Their memory images are associated with the speech centre ; the words read may be heard. From the speech centre are called up the images of visual centres. While this goes on our imagination gives us illustrations of what we

have just read, and our eyes perceive in advance another line of words. At the same time, we observe what goes on outside our book in the field of vision with a little less attention, and the ear takes in sounds, say of a band that passes our windows. We notice the melody and at the same time we notice a printer's error or criticise a badly constructed sentence. The melody may remind us of something that happened in our life. All this may go on without our being really distracted. This shows that our *ego* is formed of parts grouped together like a mosaic.

Such objectors labour under the mistaken view that each centre could or would act independently; but though the centres themselves are distinct, all of them are inter-united, and the activity of each depends on its relation to the others. **No one centre is competent to manifest itself by itself.** Each acts as a certain portion of the brain to modify the general result of cerebral action. The different centres are only points of highest activity of a special function, but none of the functions can be completely disjointed, for each specialised group of cells is connected by nerve fibres with a number of other groups, so that when one centre is roused into activity the greater part, if not the whole, of the brain may tingle in unison. **All centres may therefore be regarded as association centres.** It is through this solidarity and interdependence that no portion of the brain can be injured or exhausted without its interfering in some way with the functions of the other portions. There is, however, a great difference between saying that the various brain parts exert a mutual influence, and saying that each part does not perform its own particular function. Were the cortex of the brain a single organ, then the innate dispositions of each man would be similar. But if the various convolutions of the brain be appropriated to different mental powers, then does every modification of character depend on a different degree of development attained by these particular parts of the brain and their varying degree of activity, one man reacting to certain stimuli with anger, another with fear, another with sympathy, and so on.

Every group of cells has multiple connections with other groups and may therefore be affected by a series of impressions different in origin and, to a certain extent, also in nature. Their function is therefore very far from being limited to a single form of stereotyped activity; but at the same time it does not consist in an indefinite capacity to receive any kind of stimulus. It is simply impressionability by a certain number of minimal stimuli, subconscious and different from each other, but probably little dissimilar, which come from various parts by pre-established anatomical paths, sometimes along with others, sometimes in little processions, according to circumstances. Every group of cells acts both as an organ for reception and an organ for discharge, inasmuch as it can pass on to other groups of cells the stimulus it has received. As an organ of reception it can be impressed with various stimuli, and it has the same versatility also as an organ of distribution, passing on to near or distant cellular groups, with which it is anatomically connected, one or other impression, according to the circumstances of the moment. The course of thought is, therefore, very precarious. Its variations depend not only upon external events, but also upon the intimate changes in innumerable cells, which form part of the system accessible to a given nervous current, and which are each independently able to attract or repel this current. Theoretically the psychical process should be able to reach without limitation to any point with which there is anatomical continuity; but practically it encounters resistances and attractions, sometimes of a transitory nature, which do not allow it either to go beyond or to stop short of a given course. On account of this dynamic variability, the nervous currents, proceeding from the same point of origin, can assume an almost infinite number of material figures in the cortical space and of subjective figures in consciousness. This conception of psychical centres does away with the objection that the number, extent, and topographical arrangement of the cortical centres, being determined by the fixed order of embryological development, cannot present great differences in one individual as compared with another, and still less from time to

time in the same individual, and that this renders inexplicable the infinite variety of ways in which images, ideas, and emotions follow one upon another, even under the same external conditions.—(Tanzi.)

The position of the centres is not accidental, but is governed by fixed principles. One centre fuses with another, hence neighbouring centres are related in their mental manifestation. Centres are of a higher character, and of later acquisition, in proportion as they occupy a higher locality in the brain. Thus the highest mental powers will be found farthest from the base of the brain, for the rigid base of the skull does not admit of much expansion. On the other hand, the vault of the skull remains open in two places at least for some time after birth, and even in later life is still capable of an increased arching to make room for increased brain mass. The lowest and most indispensable mental powers—for instance, the instincts of self-preservation common to men and animals—will be found at the base of the brain.

The greater the moral and spiritual energy of a man, the higher seems to be his head; the more animal energy a man possesses the broader his brain at the base. We need only compare the heads of the really great men of the Church with, say, those of prize-fighters, and the fact will be apparent even to an unskilled observer.

It is a mistake to draw conclusions from animal physiology to human physiology as to the mental functions of the brain, as has been the fashion for the last fifty years. To mention only one fact: a slight blow to the human head may render a person insane, whereas, if we are to believe the physiologists, large portions of the brain of an animal may be extirpated without affecting its mental condition. These **traumatic lesions are often highly instructive for cerebral localisation,** for they are not only limited in the area they involve, at all events at the time of the accident, but they are limited in the damage they do to the mentality of the victim, usually **one or more mental powers becoming deranged, while in other respects the individual remains perfectly sound;** and whenever the injury affects the same locality, the same mental power suffers. Similarly circumscribed lesions due to the growth of tumours, the effects of hæmorrhage, etc., give rise frequently to definite mental changes by pressure on a limited brain area producing degeneration of the surrounding brain-cells. Such lesions may be described as **Nature's own experiments,** and, being made on man himself, are much more trustworthy and instructive than the experiments on pigeons, guinea-pigs, rabbits, cats, dogs, and monkeys conducted by physiologists.

As long ago as 1814 Sir **EVERARD HOME,** a famous surgeon (see Chapter XI.), in a paper in the Philosophical Transactions of the Royal Society, proposed keeping accurate records of brain injuries and the mental powers which become subsequently affected. "The various attempts," said he, "which have been made to procure accurate information respecting the functions that belong to individual portions of the human brain having been attended with very little success, it has occurred to me that, were anatomical surgeons to collect, in one view, all the appearances they had met with in cases of injury of that organ, and of the effect that such injuries produced upon its functions, a body of evidence might be formed that would materially advance this highly important investigation."

Some fifty years later Sir **FREDERIC BATEMAN** (*Journal of Mental Science,* 1869) wrote: "Traumatic cases may be regarded as veritable vivisections, and their study is invaluable in an etiological point of view, as contributing perhaps more than any other class of cases to sound ideas as to the question of the cerebral localisation of our divers faculties."

Still later, **WILLIAM JULIUS MICKLE,** in a paper on "Cerebral Localisation," wrote: "In the human subject, strictly limited traumatic brain lesions are among the pathological conditions which bear most clearly upon the problem of cerebral localisation. Necessarily these accidental experiments upon the human brain are sometimes as sharply localised as are the experiments of the physiologist upon the

brains of lower animals. For the purpose of the physician, indeed, they are more instructive than the latter."

Experiments on animals can produce only motor and sensory phenomena, therefore physiologists lay stress on them, and, clinical observation not coming within their range, they are apt to undervalue it in comparison with their own more exact research. But now that laboratory physiology has evidently done all it ever will do in elucidating the functions of the brain, **any further advance must be made by observing the effects of injury and disease on man,** since man is the only animal that can communicate his feelings, sensations, and thoughts by means of speech.

These clinical observations have never been made systematically. The **neurologists**—one section of the medical profession with special opportunities for them—specialise in motor and sensory phenomena and therefore place their faith in the information physiologists put before them. Mental changes, if they are observed by them, refer principally to visual, auditory and speech phenomena ; but with reference to mind proper as including intellectual capacities, sentiments, emotions, and propensities—these are rarely noted by them. Most of them do not admit any relation of emotions to brain centres, and changes so severe as to amount to insanity do not come within their sphere.

As a proof of my statement I need only refer to the French report on head injuries in the recent war, based on 5,000 cases (" Wounds of the Skull and Brain," by CH. CHATELIN and J. de MARTEL, London, 1918). Mental symptoms (except affections of sight, hearing, and the other senses) are denied by the authors —and after reading their book one really wonders whether insanity can be a brain disease.

The **alienists,** whose proper department is mind and its disorders, have no opportunity of collecting such material, for there are no real " hospitals " for the insane, and the asylums, though now called " mental hospitals," admit only advanced and more or less chronic cases.

Our asylums are like monasteries on beautiful heights in the country, surrounded by big walls, which not only prevent the escape of patients, but, by the rules with which these institutions are governed, prevent anyone but its salaried officers making clinical studies in them, and burden these officers with so many administrative duties, that only those who really love their work and are born with a gift for it ever make any contributions to our knowledge of the subject.

No wonder that until a few years back it was frequently denied that there is any difference between the brains of sane and insane ; and now, when we have a fair number of pathological laboratories connected with asylums, the only definite facts we possess are the appearances of brains in amentia and dementia (progressive, alcoholic, and senile). It is to be borne in mind that the insane upon whom we make autopsies in asylums almost always die in states of advanced dementia, or in consequence of intercurrent diseases, which, both of them, produce alterations in the brain, often entirely different from those connected with the psychosis and, wholly or in part, obscure the original characteristic changes. Moreover, localisation of mental function in the sense here described not being admitted, the pathologist takes at random slices from any part of the brain and examines the microscopical appearance of the brain-cells, usually most carefully and minutely ; but his descriptions, however valuable from other points of view, do not help us in the solution of this most important problem. All honour to the men who make these researches, they have immensely advanced our knowledge of the structure of the brain and its morbid changes ; but **their views on localisation, for or against, are still based only on surmise, since the theory has never been tested systematically,** as we propose to do in succeeding chapters.

It is rare that we get clinical cases with post-mortem observations reported from asylums. Most *mental* cases recorded in medical periodicals are by neurologists!

A sound localisation theory would enable us to point to the seat of the disease and to treat it as may be required; but to those who oppose the theory, it matters nothing whether a person be melancholic, violently maniacal, homicidal, or suffer from delusions of persecution, whether he be a kleptomaniac, a religious maniac, or fancy himself a millionaire; in every case they assume that the whole brain is affected. Unfortunately, **those who do not expect to find localised areas of disease are not looking for them, and have no inclination to examine the evidence others put before them;** hence our knowledge of this subject has made little progress. But if we are disputing one of the most elementary problems of the functions of the brain, what advance can be made in the treatment of the insane and feeble-minded? The unfit are ever increasing, and Royal Commissions are appointed to investigate the causes of this increase, but what is the good of all these inquiries when we are not yet agreed on the fundamental question of the functions of the brain: Is localisation of mental function possible?

But what about the **surgeons?** Have they not operated in thousands of cases in this war alone for localised head injuries, and are they not the best judges of the problem before us? They might be, but, so far, they are not. First of all, the surgeons are generally in a hurry, necessarily so, and have no time, even if they have the opportunity, to make detailed examination of the patient's mentality or to follow up the case.

Thousands of operations have been performed in the recent war for injuries to the skull and brain (notice the French report just referred to), and as in olden times, so now, the statement is made in the medical reports that the patient suffered neither loss of intellect nor change of character, though he lost an appreciable quantity of brain-matter. The surgeon may be right, but he should state what sort of examination he made into the mental condition of the patient and how long after the operation he had him under observation.

It has been my experience that, whenever a patient is able to return a rational answer to any simple question about his health, the surgeon and attendants invariably speak of him as in full possession of all his faculties. So long as the patient can answer ordinary questions about his food, number of his family, his location at the time, and attend to his bodily wants with some care, he is considered not to have shown any mental symptoms. But I have had the opportunity of following up several of these cases, and discovered not only some with loss of definite intellectual capacities, and certainly diminished vigour of these powers, but in a great many instances marked emotional changes—from previous cheerfulness to melancholy, from gentle peacefulness to irascibility, from affection to hatred, from honesty and truthfulness to deceitfulness and criminal tendencies. **Are these changes of character and conduct not also due to the brain lesions?** I am in a position to affirm that, if such changes were taken notice of at the time, or the possibility of their later development were recognised, measures might be taken which in many cases would save a man from the workhouse, prison, or asylum. The man with a serious brain injury has few needs, few thoughts, few feelings, and is only semi-conscious; **the questions usually put to him convey no information about his real state.** Let us follow up the history of such a case after the patient has returned to ordinary life, and a different picture will be presented. He is not the man he was before.

A man may give rational answers to questions put to him at the bedside of a general hospital, and yet be totally changed in character since his illness commenced. How is the surgeon to know unless he has some knowledge of the state of the man's intellect and dispositions during health? He may have suffered a great diminution of energy, so that he is altogether incapable of following a chain of reasoning, or comprehending a line of detail, to which, when in health, he would

have been much more than adequate. Nothing is more usual, in ordinary life, than to see a person a little unwell cease work from a consciousness of incapacity; even a common cold can cause diminution of mental vigour, and yet a severe gunshot injury is sometimes stated to have made no difference to the patient's mental capacity. This is generally due to the superficial examination resulting in such vague statements: "The senses were retained to the last"; "All the faculties remained entire"; "He had his consciousness entire, viz., he knew all around him." Sometimes we find it stated, "Memory was impaired." Which memory? Even in health not all our memories are the same. The memory for facts, events, tones, dates, numbers may be excellent, and the memory for proper names atrocious. **Where is the clinical assistant who inquires into these details and tries to discover what they were in health and what they are now in disease?**

"If the patient is free from delirium and can say 'Good morning,' and put out his tongue when told to do so, it is recorded that 'his mental faculties remained entire,' that 'there was no deficiency of intellect,' or that 'he was clear and collected to the last.' This testimony, of course, to be of any value, necessarily supposes a skilful and exhaustive exploration of the mind in all its departments, and a scrupulous attention to minute and intricate details in each particular case. Being founded, however, only upon the most superficial examination, it is not merely valueless but mischievous and misleading. To evidence of this kind must, I believe, be traced many fallacies which have impeded scientific progress, such as the statement that a whole hemisphere of the brain may be destroyed without the mind suffering in any way, or that every part of the brain has been found disorganised in one case or another, without any derangement of the mind having existed."—(Sir James Crichton-Browne.)

"That mental symptoms or mental deficiencies have not been recorded in cases of bilateral cerebral lesions is a negative statement of very little value. Unless a man becomes so demented as to neglect the ordinary wants of nature, or so furious, maniacal, or irrational as to require restraint, there are few engaged in the practice of medicine who think of inquiring narrowly into a patient's mental state, and, even if more attention were directed towards this subject, are we in possession of any means of accurately gauging the mental condition of an individual so as to be certain that it has altogether escaped damage, notwithstanding the presence of a cerebral lesion? I see little to justify, and much to contradict, such an assumption. A man may not be incapacitated for the ordinary duties of life, but that his mental powers are altogether unscathed, even by a unilateral lesion, I venture to question."—(Sir David Ferrier.)

"Every structure in the nervous system has a specific function, and if a portion is destroyed it cannot be replaced anatomically, and, from the point of view of function, the compensations which are provided indirectly are always far from being complete. If in such cases no defect is recognised, it must undoubtedly be due to insufficient methods, to which may be added perhaps a want of patience on the part of the observer."(—Ernesto Lugaro.)

It is not uncommon to find patients years after a head-injury, when it has been forgotten because it left no outward sign, present symptoms of mental deterioration due to degenerative changes set up in the cortical layers of the hemispheres. The mischief produced may be out of all proportion to the apparent severity of the lesion, and therefore such injury should never be lightly regarded. Often it is only some local irritant to the membranes of the brain—such as a splinter of bone, accumulation of fluid, etc.—while the brain itself remains perfectly sound. In such cases cranial operation is all that is needed for the relief of the patient and the more alarming brain surgery need not be undertaken. From the cases quoted in the succeeding chapters it will also be apparent that **there is no limit to the time that may elapse when surgical treatment may still be successful,** some of the cases having

been treated three, four, eight, and eleven years after the accident, one case after twenty-five years, and one even after thirty-one years.

The instructive matter in these cases is that **the moral character is usually impaired first,** and sometimes is completely perverted without a corresponding deterioration of the understanding. And still we find physicians and surgeons who neglect to inquire into the condition of the emotions and propensities in brain lesions, and proceed as if the human mind consisted of intellect only. Do we not find in ordinary ailments an increase of irritability or emotionality ? Why, then, should the state of the feelings be overlooked in brain affections ? The feelings may be changed without any affection of the intellect. MAUDSLEY, for example, held that " injury to the head will tend to produce intellectual disorder rather than emotional depression, while abdominal diseases will favour the production of emotional depression."

This lack of appreciation of the character-changes in brain lesions need not surprise us, however, for insanity has not long been recognised as a morbid condition of the brain, and it is only a little over fifty years ago that the Royal College of Physicians of London published a *Nomenclature of Diseases,* in which work insanity was dissociated from all other affections which beset humanity, and its varieties were comprised under the heading " Disorders of the Intellect," all connection with the emotions being disregarded.

It is due to lack of proper psychological training and knowledge of the elements of human character that the statement is so frequently made that all the faculties have been found entire after a brain lesion. But if a person of a mild and peaceable character, after a wound on the head, becomes quarrelsome and morose ; and if another, whose life had always been irreproachable, after a similar accident should feel an irresistible inclination to steal, it is evident that, though these persons preserve consciousness, memory, judgment, and imagination, we cannot thence infer that the injuries inflicted have produced no derangement of the mental functions. Do animals not possess consciousness, memory, and judgment ; but are they therefore on a level with men ? If a man were by disease reduced, in point of faculties, to the level of a dog, but still enjoyed the five external senses, as well as some portion of memory and judgment, would he, therefore, have lost no characteristic faculty of humanity ? If partial idiots have perception, memory, and judgment, are all the faculties of the mind manifested ? It is evident, therefore, that **the mental examination of patients with brain lesions will have to be conducted on very different lines in the future** if we wish to discover the mental functions of the brain.

As has been shown in a previous chapter, the views on localisation are so conflicting, that the wisest plan for physicians and surgeons to follow would be to content themselves with placing on record the facts they observe and to let them, as it were, speak for themselves. If, as hitherto, every observer has his own preconceived notions, and draws conclusions from one or two cases that have come under his care, his report is useless ; just as much as is the report of that other man whose mind is " made up " that localisation of any sort is impossible.

Another necessary criticism of medical and surgical reports is the **vague description of the locality of the lesion.** It is not enough to say " patient received a blow on the head," or " there was a scar on the side of the head," without telling us what bone had been injured and what part of it.

RATHMANN (" Vierteljahrschrift f. Gerichtl. Medizin," 1901) gives fifty-one cases of head injuries followed by mental derangement, most of them without indication of locality.

As we have already said, the more highly developed the mental powers, the more connected will the various channels of the brain become by means of intercommunication. Though the centres themselves are distinct, all of them are

inter-united, and the activity of each depends on its relation to the others. It is therefore a mistake to look for a protuberance of brain-matter, or a bump on its outer covering, the skull. Let me repeat again that no one centre is competent to manifest itself by itself. Each acts as a portion of the brain to modify the general result of cerebral action. It is through this solidarity and interdependence that no portion of it can be injured or exhausted without it interfering in some way with the functions of the other portions. There is, however, a great difference between saying that the various brain parts exert a mutual influence, and saying that each part does not perform its own particular function.

Destruction of a particular area, even if we know its exact boundaries, need not necessarily cause loss of a definite mental function, for no organ ever works alone ; it sets into vibration other brain organs ; just as we can rarely think of one subject or event without being reminded of a number of others associated with it, and having various feelings aroused at the same time. There must be division of labour in the cortex as elsewhere, and certain groups of cells will be occupied with preference with one fundamental psychic quality rather than with any other. We may in certain clinical cases of circumscribed lesions discover an increase or diminution of activity of a special mental faculty, but I can see no other way of discovering its seat.

Owing to these inexactitudes, the number of observations really available for scientific purposes is comparatively small. If the records of these cases were more carefully taken, both as regards the extent and location of the injury as well as to the mental changes following it, we should obtain most valuable information, whereas now this vast material is almost lost to us.

Owing to these inexactitudes we read such statements as : "Abscess of the brain may exist, or portions of it may be carried away by gunshot or other injuries, and yet no perceptible difference be observed in the mentality of the individual." After reading this one wonders what really is the use of the brain. It is only the vague, indefinite manner in which all these examples are produced that save the head and its contents from the imputation of being useless appendages. **The brain is the instrument of all the mental powers, and it betrays great indifference to assert that it matters not whether the instrument be a whole or a broken one.**

It must, however, be distinctly admitted that instances of extensive cerebral disorganisation occur in which neither mental, nor motor, nor sensory disturbances appeared during life of so marked a character as to excite a suspicion that such things existed ; but this kind of anomaly is by no means limited to the brain. Numerous cases are recorded in which a whole lung has been destroyed, or the greater part of the liver disorganised, or a kidney has disappeared, without any suspicion having been entertained during life of the real state of matters ; and it would obviously be as reasonable to infer from them that the lungs were not the organs of respiration, or the liver the organ of biliary secretion.

The fact that is frequently overlooked is that **the brain is composed of two similar halves** or hemispheres, and that, consequently, all the centres must be double. The wonder is that one-sided injury so often causes an accentuation or loss of a particular mental power ; for, as a matter of fact, both centres should be destroyed to cause complete loss of the function with which it is concerned.

Though we may speak of a centre, it is understood that as there are two hemispheres of the brain, every centre is two-fold, and to this fact may be due those few instances in which a particular centre has been injured or destroyed without a loss of any mental power being discoverable. This is especially the case in accidents to the right half of the brain, which seems to be less active than the left. When the two halves are unequal, I have frequently observed that **the right represents what the individual is by nature,** *i.e.*, his inherited organisation, and **the left what he has made of it.**

It has also to be noted that diagnosis in cases of blows to the head is often rendered difficult because of the effects of **contre-coup.** The head may be struck on the occiput, but the concussion causes the brain to shoot forward and impinge upon the frontal bone, where the effects may be produced. Were the mental functions of the brain better known, we should be more certain when a contre-coup has taken place, and would not have to wait for the post-mortem examination.

Another difficulty is that **the emotions and propensities may become accentuated by a lesion of those parts of the brain with which these are connected ;** but they may also become accentuated when the lesion is in that part of the brain which has to do with the intellectual functions ; because, the intellect being impaired, there is little or no control over the emotions and propensities. For example, it will be shown that a lesion of the lower part of the temporal lobes is almost invariably followed by symptoms of irascibility ; but a lesion of the frontal lobes by destroying the control over the emotions may accentuate an irascible disposition. For this reason we should always know the state of the mind when the patient was in health.

Another puzzling difficulty to some observers is that **in lesions of the brain the particular mental function is sometimes manifested more intensely ; at other times it is diminished or lost.** This is explained by the inflammation preceding the destruction of the nerve-cell. During the process of inflammation the activity of the function connected with the area involved will be stimulated to hyperactivity, and when degeneration commences and destruction takes place the function connected with the circumscribed area will diminish or vanish. This is in agreement with the law of the " temporary excess of function in atrophy," by **CLAUDE BERNARD,** which is : " When a histological element dies, or tends to die, its irritability, before diminishing, begins to augment, and it is only after this exaltation that it decreases again, and gradually becomes extinct." It has also to be noted that **when the region of the intellectual functions is damaged, these get lost ;** but **when the region of the emotions and propensities is injured, these are augmented.** As a rule, the emotions become accentuated in inflammatory lesions of the parts of the brain concerned with them ; while intellectual powers appear to be lost. (For proof of this statement see succeeding chapters.)

For clinical cases to be of use for localisation, both the history of the disease and the description of the post-mortem condition must be trustworthy, full, and unambiguous ; and there should be no other lesion than the one in the cerebral cortex to complicate the legitimate inferences. These conditions are rarely fulfilled, and it is therefore a mistake to collect all cases indiscriminately to prove or disprove a particular theory. Thus Dr. PAUL SCHUSTER (of Prof. Mendel's Polyclinic), in his work on " Psychische Störungen bei Hirntumoren," Stuttgart, 1902, examined the localisation theory (as advanced by me in outline in a pamphlet published some twenty years ago) by collecting all cases of brain tumours recorded in history and noting the mental changes produced by them, if any. He found, of course, that only rarely did the records harmonise with my theory. In the succeeding chapters I shall produce the history of some hundreds of cases of brain tumours, omitting all those too vaguely described, and it will be seen as definitely as to amount almost to a law **that the mental manifestations in cases of brain tumours involving the cortex vary according to the locality in which the growth is located,** and that tumours in the same region produce the same manifestations.

Still, **I do not claim that all the cases quoted by me are perfect ;** possibly some may be objected to on closer inquiry. But whatever the defect of individual cases, I shall produce such a volume of evidence, accurately recorded beyond all question, as shall induce, not necessarily the acceptance of my theories, but **a fresh investigation into the whole subject of mental functions,** on the lines suggested by me ; not on the basis of former cases, but on new ones as they happen to occur.

It may be objected that **many of the cases cited by me are not recent ones;** some might even be described as ancient. But is this really a vital objection to the theories advanced? Such facts as I have just quoted—as that our modern students are trained to devote all their attention to the microscopical appearances of the brain in the different psychoses to the neglect of naked-eye appearances; the prevalence of the toxin theories to account for most forms of insanity; moreover, the lack of opportunity to study the early stages of mental disorders; as also the fact that intellectual changes are not inquired into with sufficient minuteness; and character changes are often disregarded altogether as not dependent on brain conditions; and last, but not least, the contempt with which the localisation theory of *mental* functions has hitherto been regarded—all these facts explain sufficiently the lack of adequate material.

Pathologists will now know what to look for to discover focal lesions; and surgeons will learn when and where to operate, the more frequently the more definite our knowledge of the mental functions of the brain becomes. Already there is a fair number quoted in which surgical operation has been performed successfully, not only in cases of injury to the head, but also in inflammatory lesions, hæmorrhages, and new growths.

If my theory of the physiological basis of human character—of the localisation of the fundamental qualities and dispositions in the brain—be right, it can hardly fail to lead to **a more perfect understanding of human character,** and, indirectly, to the elucidation of some of the most difficult and interesting psychological, educational, and social problems. So much is certainly evident, that not only as regards the intellectual qualities, but as regards the strength of the primary feelings, we do not start life equally, but with advantages and disadvantages according to our inherited organisation. The highly organised brain is bound to lead, to dictate, to govern, while the more weakly endowed is born to a life of servitude and submission. From this it follows that no uniform system of education is in conformity with nature; moreover, it becomes evident that parents and teachers must train the feelings and propensities as well as the intellectual capacities of children, since the former as well as the latter depend on the inherited brain organisation, and the feelings supply the motives to the exercise of the intellect, and on their proper development and restraint depends the whole character and thus the future of the man.

This question of localisation of function is of the highest importance both to the psychologist and the physician. Those who admit that the primary mental powers have separate centres in the brain will condemn uniform methods of education and lay stress on individual training according to the organisation. The localisation theory will enable us to explain abnormalities of character and to trace them to their cause; and, speaking as a brain-specialist, **the localisation theory is of the greatest importance in the diagnosis and treatment of those early stages of mental derangement when the pathological changes have not yet advanced too far** and the patient is not mad enough to be certified as insane.

In conclusion, let me repeat that I do not wish anything contained in these pages to be taken for granted. I shall be satisfied if I can claim to have indicated the lines on which future research might be undertaken with better results than have been hitherto achieved.

CHAPTER XXIX

INTELLECTUAL OPERATIONS AND THEIR CEREBRAL ORIGIN

We have seen that there are elementary feelings and propensities which man and animals have in common, and which exist for the preservation of the animal and man without consciousness, reflection, or active participation on the part of the individual being necessary. But if it be admitted that we have elementary feelings in common with animals and are distinguished from them by our greater intellect and higher sentiments, and if it be admitted that all mental operations take place in and through the brain, then we must presume that **we have some parts of the brain in common with animals and some which are distinctly human.** This is proved by comparative anatomy. If we take the lowest animal which has a rudimentary brain, and observe the gradual development throughout the whole species of animals till we reach the highest apes, whose brain most closely resembles that of human beings, we shall see that, in accordance with the gradual development of the reasoning capacity of animals, there is a part of brain, corresponding to the *frontal lobes* in man, which correspondingly increases in size and is relatively largest in the gorilla, chimpanzee and orang-outang, though their frontal lobes are still smaller in size than those of the lowest human idiot. As the other lobes in man and animals show no such disproportion, we may draw the inference that **the frontal lobes are related to functions which are distinctly human,** that they are the instruments for **abstract thought** and the **higher intellectual operations,** and possibly for the **higher human sentiments.**

Again, if we study embryology and observe the growth of the human brain, we shall find that those parts which are the latest and highest acquisitions grow last, and that as the reflective and reasoning faculties are latest in arriving at perfection, the frontal lobes are the last to develop.

If we now examine the brains of microcephalic idiots, we find that the arrested development is chiefly in the frontal lobes. Indeed, if we compare the frontal lobes of imbeciles with those of men distinguished for their intellectual qualities, we find a great contrast in their size, though the remainder of the hemispheres has attained to normal growth. The contrast is more eloquent than any language can express. On the other hand, it is not to be overlooked that examples of idiocy and imbecility are not rare where the head is of average size and shape, and where the mental deficiency is congenital through an insufficiency of neuronic elements.

As the deficiency of the frontal lobes is not accompanied by a corresponding deficiency of the rest of the brain, the emotional life of all the higher idiots, as of all the higher animals, is remarkably vivid as compared with their intellectual life. All the propensities and emotions are present, except the higher emotions—the ethical, æsthetical, and spiritual—which belong to the frontal lobes, as we shall show. True, their emotions are not profound. A trivial event will make them laugh or cry, and it is easy to hurt their feelings with a slight offence; on the other hand, the death of a dear relative is very soon forgotten, while the stronger passions do not

occur with that force and persistency common to normal man. The higher faculties, that belong to the frontal lobes, as I said, are absent. There is, for example, no idea of right and wrong. The higher idiots do experience a feeling of remorse on offending the sympathies of those whom they love ; but, it seems, some dogs know when they have done wrong and hide themselves from their master.

There are a number of **anthropological facts** in favour of the view that the frontal lobes are related to the intellect.

The expansion of the frontal lobes in men engaged in intellectual pursuits has been repeatedly demonstrated by actual measurements. It has been shown that the frontal lobes vary in size and weight in different races according to their intellectual capacity. Anthropologists have demonstrated from examination of European skulls that the progress of civilisation has resulted in raising the anterior and flattening the posterior part of the head.

HERMANN WAGNER (1840-), inspired by his father, RUDOLF WAGNER (1805-1864), in 1864 compared the mean proportions of the cortex in man and the orang. The occipital lobes proved larger in the orang than in man, while the frontal lobes were considerably smaller. He also weighed each lobe of the brain of Gauss, the mathematician, and of other eminent men, and compared it with the weight obtained from the brains of working-class men. The workmen had the smallest frontal lobes, but larger occipital lobes than the celebrated mathematician.

GRATIOLET (1815-1865) distinguished the principal divisions of our species by that bone of the skull which is relatively the largest. Thus (1) Frontal or Caucasian ; (2) Parietal or Mongolian ; (3) Occipital or Ethiopic. He has shown that in the Caucasian, the anterior fontanelle is the last to ossify, and thus permits of the greatest possible development to the frontal lobes ; and that in the Ethiopic race the converse condition obtains, the posterior fontanelle being the last to ossify. According to this arrangement, in the superior races the frontal lobes of the hemispheres continue to develop for a long time after the occlusion of the posterior sutures has put an end to the growth of the rest of the brain ; in the inferior races, on the contrary, the ossification of the sutures proceeds from before backwards, and, thus the anterior parts of the brain are first arrested in their growth.

The important researches made in reference to ancient skulls by the **ABBÉ FRÈRE,** whose rich collection is in the Anthropological Museum at Paris, led him to the conclusion that the skulls of Europeans have increased in size since historic times ; and that the progress of civilisation seems to have resulted in raising the anterior and flattening the occipital part of the skull.

PAUL BROCA (1824-1880) examined the heads of thirty-two house surgeons who had successively resided at the Bicêtre during the years 1861-1862, and compared their dimensions with those of the heads of twenty-four porters attached to the various wards of the same hospital. This comparison resulted in the confirmation of the generally received opinion, that the anterior lobes are the instruments for the higher intellectual operations ; and Broca considered that he had demonstrated that the cultivation of the mind and intellectual work augment the size of the brain, and that such increase affects chiefly the anterior lobes. ("Revue Scientifique," 1861-2.)

J. B. M. PARCHAPPE (1800-1866) also made measurements and found that the frontal lobes in men of learning have much larger proportions than in common working men.

LACASSAGNE and **CLIQUET** have examined, by aid of the *conformateur*, the heads of 190 doctors of medicine, 133 rudimentarily educated persons, 90 illiterate persons, and 91 prisoners (soldiers), with the following results. There was a considerable difference in size of head in favour of the doctors, and this was especially marked in the *frontal* measurement. In the educated, the frontal region was more developed to the left, and was altogether proportionately more developed than the occipital region, which was the larger in the case of the illiterate.

ALEXANDER MacALISTER (1844-1910), Professor of Anatomy, at the British

Association Meeting, Edinburgh, 1892, declared that "increased growth of the frontal lobes is the physical accompaniment of intellectual activity."

THEODORE MEYNERT (1833-1892) found that in normal brains the ratio between the weight of frontal plus temporal lobes and the weight of parietal plus occipital lobes is as 6 : 3. In dementia paralytica and dementia senilis this quotient is 5 : 4, showing that the frontal lobes and temporal lobes have lost the most.

SCHRÖDER VAN DER KOLK (1797-1862) wrote : "That to all parts of the cerebral convolutions are not assigned exactly similar functions was long ago suspected. Further, that a finely arched forehead indicates, as a rule, high intellectual endowment was already not unknown to the Greeks, as we may conclude from their delineations of Jupiter, Apollo, and so forth. The strongly prominent forehead as the prerogative of man came yet more definitely into view when Camper proposed the facial angle named after him, and pointed out its difference in Azteks, Negroes, and Europeans, in children likewise and in grown-up persons."

Whenever decided talent is found conjoined with a small frontal region—small in all its dimensions and relatively to the other regions of the brain and to the body generally—there will also invariably be found a vivid and energetic temperament and such propensities and emotions which act as a stimulus to the intellect ; or else however little there is of the intellect has been concentrated upon that particular field of study for which there is some natural gift. Energy of character, industry, application, often make up for natural talent.

On the other hand, one can see everywhere plenty of big foreheads, high, broad, and with a large base from the opening of the ear to the outer corner of the eye—so that we may presume large frontal lobes, without their possessors being remarkable for intellectual ability either general or in one particular. There are various reasons to account for this, the most common being that **the brain has never been stocked with knowledge,** or only with trivial information such as a cheap Press supplies ; the person may be easygoing, lack nervous energy, application, or, what is not uncommon, he may be a mere dreamer.

Remarkable foreheads may be seen amongst working-class men. Some do not show any special knowledge, but sound, practical views on the problems of life, while a great many others have studied for themselves politics, political economy, and even special sciences, in which they excel. But **we must look for something more than an apparently large forehead for a sign of intelligence, ability, etc.** The head must be well proportioned all round ; otherwise, if the sides or the back of the head predominate over the front, the intellect will be merely in the service of the functions of these parts.

I shall show—on the strength of a large number of clinical cases by independent observers—that **over-stimulation of the frontal lobes** by hyperæmia, congestion, etc., leads to :

(1) A joyful disposition, and in its trend extreme hopefulness, feeling of well-being, mental exaltation, delusions of grandeur and ambitious delirium (a false belief of possession of honours, fabulous property, and extraordinary mental capacities) ;

(2) A state of mania, namely hypomania.

(3) When the stimulation amounts to congestion, paralysing the frontal brain-cells, or destroying them, there will be loss of self-control, *i.e.*, loss of inhibition over emotions and propensities ; consequently loss of ethical, æsthetical, and religious sentiments (and through the loss of inhibition, the patient seeks immediate gratification of his desires).

Further, it will be shown that **destruction of portions of the frontal area** leads to :

(1) Loss of active apperception ;

(2) Defects of memory ;

(3) Defect or loss of logical reasoning; and when involving the greater part of the substance, there will be

(4) Dementia.

The larger the frontal lobes, the greater the power of inhibition, suspending and postponing the immediate and direct pursuit of an end, a step which lies at the root of all progress, civilisation and morality. The larger and more perfect the frontal lobes, the more reasoned adaptation enters into the action of instinctive tendencies, and the greater the self-control.

Experiments on animals confirm the view that the frontal lobes are the centres of perception and reflection, and the centres of inhibition against the instinctive impulses, so that they form the basis of the moral sentiments as far as their rudimentary existence can be demonstrated in the lower creatures.

HITZIG (1838-1907) said: "It is true that the intelligence exists in all parts of the cortex, or, rather, in all parts of the brain, but I hold that abstract thought needs a separate organ, and seek for it in the frontal lobes." He claims to have observed that dogs whom he deprived of the frontal area forgot all they had learned and could not learn anything new.

FERRIER observed that "after removal or destruction by the cautery of the antero-frontal lobes, the animals retain their appetites and instincts, and are capable of exhibiting emotional feeling. They have lost, however, the faculty of attentive and intelligent observation." He locates the centres of reflection and attention in the frontal lobes.

BIANCHI found after destruction of the frontal lobes in dogs and monkeys that the curiosity to observe, which is so marked in monkeys, is lost; that they are not able to receive new impressions, or to remember or reflect on the old; and that since they can no longer criticise they become timid and easily excited. The frontal lobes appeared to him not only centres of perception and reflection, but also co-ordination centres of the rest of the brain. He said: "The animals remain friendly, they still caress or show affection. They can get into wild excitement. They show fear more readily. They become cautious, but cannot avoid accidents; these strike terror into them. They eat with reckless avidity. They are duller and sleepy. The physiognomy is stupid; the expression cruel. They show no gratefulness. They cannot adapt themselves to new surroundings, neither learn anything new, nor regain what they have forgotten." His hypothesis is "that the frontal lobes are the seat of co-ordination and fusion of the incoming and outgoing products of the several sensory and motor areas of the cortex. The frontal lobes sum up into series the products of the sensory-motor regions, as well as the emotive states which accompany all the perceptions, the fusion whereof constitutes what has been termed the psychical tone of the individual. Removal of the frontal lobes does not so much interfere with the perceptions taken singly as it does disaggregate the personality, and incapacitate for synthetising groups of representations. The actual impressions which serve to revive those groups thus succeed one another disconnectedly under the influence of fortuitous external stimuli, and disappear without giving rise to associational processes in varied and recurrent succession. With the organ for the physiological fusion which forms the basis of association disappear also the physical conditions underlying reminiscence, judgment, and discrimination, as is well shown in mutilated animals." The destruction of the frontal lobes, according to Bianchi, entails the loss of the anatomical and physiological basis upon which judgment and the reasoning faculties are reared. The monkeys operated upon by Ferrier lost the power of psychical concentration and attention. According to Bianchi, the animals lost much more, namely, the power of recalling the images of previous sensations in commemorative form, and the power of associating these images in abstract synthesis. He observed the same symptoms in the human subject in cases of tumour affecting the anterior portion of the brain.

Hitzig's, Ferrier's, and Bianchi's localisation of the intellect possesses a special interest owing to the fact that it contains a negation, implied if not expressed, which

is more important than the affirmation : Whilst they assign an intellectual function to the pre-frontal lobes, they deny it to the other regions of the cortex.

ANTON agrees with Bianchi ; and **COLELLA,** too, considers, as a result of his experiments, that the pre-frontal lobes are the seat of the highest psychical functions.

S. J. FRANZ (" Archives of Psychology," 1907), after training monkeys and cats, destroyed their frontal lobes, when he found that all freshly acquired habits and knowledge were lost ; but if any other part of the brain was destroyed they were not lost. This loss cannot be ascribed to shock, loss of blood, or the anæsthetic, for in the destruction of the other parts they are just the same. If one lobe was destroyed, the intellectual associations and actions were not lost but retarded. **The emotions and passions were manifested the same as before.**

LUSSANA (1820-1898) extirpated *the first and second frontal convolutions and the orbital lobes* of dogs and observed that such animals **no longer recognised their master, nor the street or house** they lived in. Destruction of any other area of the brain still preserved these memories. This observation will be confirmed by me by a large number of cases of lesions of these parts in man.

Pathological observations also confirm this localisation. It is universally known that in senile dementia and dementia of any kind, including dementia paralytica or general paralysis of the insane, the greatest atrophy occurs in the frontal lobes. Physiologists not being pathologists, many of them have taken no note of this. Moreover, the convolutions of the frontal lobes in idiots and imbeciles are deficient and there is a want of development of the nerve-cells—as we should expect if our theory is true.

MEYNERT (" Wiener Medizinische Presso," 1886) observed that " all forms of dementia, including senile dementia and dementia paralytica, are due to brain atrophy affecting the frontal lobes, whose weight is much reduced, whereas the other lobes are hardly at all involved."

HITZIG pointed out already, in 1874, that the ruin which progressive paralysis—that implacable destroyer of the intellect—produces, is pre-eminently in the cortex of the frontal lobes.

FERRIER observed in lesions of the frontal lobes " inability to fix the attention," and he says : " The frequent association of idiocy with defect of the frontal lobes is a generally recognised fact."

CARL VOGT (1817-1895) found : " The brain formation of microcephalous idiots does not depend on an arrest of development of the brain equally all over, but chiefly of the frontal lobes."

B. SACHS found : " Large porencephalic defects in the parietal areas are compatible with a tolerable high mental development, whereas a defective development of the frontal lobes leads to complete idiocy even though the remainder of the hemispheres has attained to normal growth."

JOSEPH SHAW BOLTON has shown that in dementia the frontal cortex, especially the pre-frontal area, is greatly degenerated, and that in idiots the degrees of mental deficiency correspond with the lack of development of the same region, while the remainder of the brain may be normal. " The pre-frontal region is the region of the cerebrum which is concerned with the performance of the highest co-ordinating and associational processes of mind." Bolton—in opposition to A. W. Campbell—has found that the pre-frontal area of the brain is of extremely complex structure and of finer architecture than any other part of the brain. " It is the last region of the cortex cerebri to develop ; it possesses the highest associational functions, and is the first to undergo retrogression. The greatest amount of wasting in *dementia* occurs in the pre-frontal region. In cases of *amentia* there is under-development of the pre-frontal region and a more or less marked simplicity of the convolutional pattern. The high-grade ament is a man who is required to do a man's work with a child's brain." (*Journal of Mental Science,* 1906.)

CHARLES K. MILLS, late Professor of Neurology in the University of Pennsylvania, said : " The region of the brain in which focal lesions have produced persistent psychic symptoms has been the pre-frontal lobe. If these lesions are

both extensive and deep-seated, disorders of memory, will, attention, comparison, and judgment may be present." And again: "Lesions of the pre-frontal lobe, although this is one of the so-called latent districts of the brain, have in a large percentage of the carefully studied cases shown distinctive manifestations. The symptoms are largely psychical, and unfortunately the physician is not usually well trained to study such phenomena. Mental disturbances of a peculiar character occur, such as mental slowness and uncertainty, want of attention and control, and impairment of judgment and reason; closely studied, the inhibitory influence of the brain both upon psychical and physical action is found to be diminished."

G. ANTON ("Neurologisches Centralblatt," 1900) gave the following description of lesions of the frontal lobes: "Injury to one frontal lobe has as a consequence that the intellectual functions can be carried on only with greater exertion. The memory and judgment are weakened, and continued attention is rendered difficult. If the disease extends to the other frontal lobe as well, then we have sudden and hopeless dementia."

F. DURANTE said that lesions of the frontal lobes are always followed by intellectual changes, and that the frontal, especially the pre-frontal, region is the seat of the highest mental powers.

P. SCHUSTER ("Mental Changes Accompanying Brain Tumours," 1902) stated that melancholia and paranoia are hardly ever observed in lesions of the frontal lobes, but mania and dementia are.

P. FLECHSIG ("Gehirn und Seele," 1896) located in the frontal lobes the anterior association centre of attention, reflection, inhibition. It is concerned with abstract concepts and other complex intellectual processes. He observed the following changes taking place in lesions of the frontal lobes: (1) active apperception ceases; (2) logical reasoning becomes defective; (3) loss of ethical and æsthetical judgment; (4) exaltation; (5) loss of self-control.

Richet, De Bayer, Duret, Grasset, P. W. MacDonald, and many others expressed similar opinions as to the functions of the pre-frontal lobes.

The majority of physiologists have ignored Wundt's distinction between perception and apperception—the centres for which he located in the frontal lobes—and persist in placing these centres in the sensory regions, visual, auditory, etc. We shall deal with these centres in this chapter, and will mention for the present only that from the evidence which we are about to submit it does appear that they are related to the lowest parts of the frontal lobes, viz., the inferior parts of the three frontal convolutions, the orbital convolutions, and perhaps the small convolutions within the fissure of Sylvius. We shall quote cases which demonstrate that **destruction of these parts causes loss of definite perceptive powers and memories.**

We also find that when the frontal lobes are destroyed by injury or disease the processes of judgment and reason are diminished, there is an inability to fix the attention, to follow a continuous train of thought, or to conduct intellectual processes, ultimately ending in complete **dementia.** We find, moreover, that in such men the struggle between the lower instincts and ethical feelings is diminished or does not exist any longer, and instead of a rational man, we see a creature given over to the satisfaction of his lower desires. Such is the case in all forms of lesions of the frontal lobes, and it does not occur in lesions of other parts of the brain.

Hyperæmia of the frontal lobes of the brain, or any other irritating pathological condition, causes an increased activity of the mental processes of perception, association, and reproduction. The patient forms numerous plans and projects, has a rapid flow of ideas, and through stimulation of the speech centre is loquacious, but his stream of talk and ideas is perfectly coherent; it is only in the advanced stage that he may become incoherent. The other lobes of the brain being unaffected and deprived of the control of the intellect, manifestations of the natural feelings and animal spirits occur. There is a peculiar hilarity and tendency to jest, and there may be actual exaltation. The patient is free from hallucinations and delusions, knows his surroundings, and many men fail to recognise in him anything

abnormal. This state of mind is called *manie* by the Germans and French, and is not the same as the English " mania," by which usually a furious state is meant, described by the Germans as *Tobsucht.*

In the **hypomaniac,** as the patient suffering from *manie* is sometimes called, all the psychical processes take place with unwonted alacrity and exuberance, creating in the mind of the patient joy, satisfaction, and self-confidence. There is euphoria, a happy state, and moria, a jocular state of mind. The good spirits of the hypomaniac seem, excepting for occasional slight abatement, to be inexhaustible ; they almost never leave him ; they make dangers invisible, misfortune light, life easy, and its struggles pleasant. If some incident in a patient whose frontal lobes are excited (as in *manie*) arouses ill-humour, it is not for long, and certainly does not increase to blind fury (as in *Tobsucht*) ; but the two forms of mania can occur together, and usually the former lapses into the latter.

Temporary depression may precede the maniacal attack from a vague consciousness of an approaching mental disturbance. A temporary state of depression may also follow the attack in consequence of the exhaustion after the excessive mental and motor activity, and partly from the recollection of the mental illness and a reflection on the consequences of the many foolish things said and done. Such depression is under the circumstances perfectly natural, and should not be mistaken for " melancholia."

EUPHORIA

Both in functional and organic lesions of the frontal lobes there is one characteristic that is missing in lesions of any other part of the brain, and therefore diagnostic, that is, **the patient has no anxiety as to his condition ;** on the contrary, frequently there is a sense of well-being and general optimism—a mental condition called *euphoria* is present, while depressio n is most common in lesions of the parietal and occipital lobes.

While the parietal lobes, as will be shown in the next chapter, seem to be in special relation to the sympathetic nervous system, the frontal lobes appear to be specially connected with the cerebro-spinal nerves, and consequently their stimulation gives rise to unrestrained, spontaneous muscular activity, with a feeling of joy, as seen in laughter and play. Certain it is that lesions of the frontal lobes are more often accompanied by euphoria, and lesions of the parietal lobes by melancholia, and that in the one there is an excess, and in the other a diminution of mental and muscular activity. For exceptions, see next chapter.

The mental processes of perception, association, and reproduction are stimulated, and there is emotional exaltation ; hence the patient exhibits a rapid flow of ideas, coupled with an unmeaning gaiety and increased motor activity. The perfect health and general well-being of these patients renders them joyous, talkative, satisfied with themselves and content with others. Natural dispositions such as hope, pride, and ambition, in addition to the imagination, are stimulated to excess as the disease progresses ; delusions of grandeur and of vanity, of increased wealth, power, and importance may develop, followed by confusion and disorientation, until all the ideas are affected and chronic dementia is the result.

The patient, as has been mentioned, may get angry when offended, or on receiving ill-treatment, but his irascibility does not last. It is over when the cause is withdrawn. Similarly his motor excitement is of the joyful type and not of the destructive furious rage order. If damage is done it is good-humouredly. This distinguishes the hypomaniac from the " acute " furious maniac.

The patient's stream of talk in the early stage is perfectly coherent, as we have already pointed out, but it is not always refined owing to the loss of inhibitory power over the propensities ; hence the patient may show erotic passion or he may steal

if there is an inclination to it normally, but even then it is not done from a blind impulse but from a desire to do mischief for the fun of the thing. This desire to do mischief for his or his companions' amusement may prove troublesome, but is easily controlled by judicious management, and need not be regarded as dangerous.

The euphoria of frontal lesions is not based on delusions but is absolutely free from any motive. It is also in sad contrast to the seriousness of the patient's condition.

Frequently there is to be observed an inclination to witticism, joking, punning —a state called **moria**—which also does not occur in lesions of other parts of the brain.

P. SCHUSTER ("Psychische Störungen bei Hirn-tumoren") found irascibility a symptom in frontal tumours; but he included any and every case he could find in medical literature, and thus included also epileptics who developed frontal tumours. But irascibility is a common symptom accompanying epilepsy and not diagnostic of frontal tumours. Schuster included even alcoholics suffering from frontal tumours as showing irascibility.

M. JASTROWITZ ("Deutsche Medizinische Wochenschrift," 1888) noticed in tumours of the frontal lobes a peculiarly cheerful excitement—hilarity and witticism—which is retained sometimes even on the operating table until the application of the anæsthetic. He observed also that the patient is given to grimaces.

H. OPPENHEIM ("Charité Annalen," vol. x., and "Archiv für Psychiatrie," 1890) gave quite a number of cases of frontal tumour with abnormal witticism and humorous remarks.

L. BRUNS ("Deutsche Medizinische Wochenschrift," 1892) observed play with words—punning—and witticism.

A. RICHTER ("Allg. Zeitschrift f. Psychiatrie," 1883) and **KNÖRLEIN** observed grimaces.

Sir **WM. GOWERS** ("Textbook on Nervous Diseases") and **M. BERNHARDT** ("On Brain Tumours") noticed childishness and childish actions.

J. B. F. BAILLARGER (1809-1890), "Annales Médico-Psychologiques," 1881), published six cases of "ambitious delirium," *i.e.*, mental exaltation, with focal lesions in the frontal lobes. The delirium may continue for six months or longer, he said, without lesions of chronic perencephalitis.

Prof. **COLIN**, of Val-de-Grâce, published in 1878 a paper on "General Paralysis, in which he declared that a lesion of the frontal lobes of the brain may become the starting-point of general paralysis, by extension of what is at first a focal area.

MEYNERT held that in mental derangements in which exaltation forms a prominent symptom the frontal lobe is the affected part, not so in derangements in which depression is the leading characteristic. ("Erkrankungen des Vorderhirns," 1884.)

F. OBERNIER considered exaltation to be one of the symptoms of tumours of the frontal lobes.

A. VOISIN ("Traité de la Paralysie Générales des Alienés," Paris, 1879) assumed a centre of exaltation—centre de grandeur—in the brain.

EXAMPLES OF EUPHORIA AND EXALTATION

CASES OF FRONTAL TUMOURS

Case of Frontal Tumour with Euphoria.

THOMAS LYLE ("Journal of Mental Science," 1880):

T. H., a boatman, "keeps in the very best of spirits. When asked how he is, says he feels 'very well,' repeating the words 'very well.' He sings occasionally, and talks a good deal of the fine boats he possesses, and addresses strangers by some familiar name, such as 'Joe'; labours under the delusion of mistaken identity, and holds out his hand to shake hands with strangers, believing he has known them all his life. Takes his food well and enjoys it. Generally very happy and contented. No history or symptoms of syphilis." Post mortem, a tumour was found occupying the greater part of the right frontal lobe.

Case of Frontal Tumour with Euphoria.

F. X. DERCUM (" Journal of Nervous and Mental Diseases," 1910) :

M. S., age thirty-two, merchant. " The patient's answers to questions are somewhat variable and he is at times distinctly confused. He smiles readily and seems quietly pleased. He manifests no anxiety as to his condition. He asks no questions." A huge tumour was removed from the frontal lobe. Patient died shortly afterwards.

Case of Frontal Tumour—Euphoria—Moria—Disturbances of Memory.

D. CAMPBELL (Altona), "Monatsschrift für Psychiatrie u. Neurologie," 1910 :

Patient, thirty-seven years old, conscious of his surroundings, gives a correct account of his past history, but confabulates when interrogated about recent events, has no sense of time, does not know recent dates, is indifferent as to his condition, cheerful, witty, easily irritated but quiet when left alone. Post mortem, tumour was found involving both frontal lobes.

Case of Frontal Tumour—Euphoria and Loss of Memory.

CASTAN and LEJONNE (" Revue Neurologique," 1901) :

A woman, age thirty-three, was admitted into the Salpetrière with optic neuritis, Jacksonian epilepsy, and a peculiar psychical disturbance. Suffering at the commencement of her illness from apathy and torpor, probably due to cerebral compression, she now passed into a state of high spirits, looking happy and smiling when spoken to, complaining no longer, and showing signs of good humour and good appetite. Her intelligence seemed a little blunted, and she laughed at almost everything which was said to her, and exhibited little initiative or volition of her own. Her recollection of things said to her was poor. Her habits remained neat and clean, and she was free from dementia. A somnolent state succeeded the euphoria, lasting three months. The necropsy revealed a large cystic tumour involving the posterior two-thirds of the ascending frontal convolution.

Case of Frontal Tumour with Euphoria, Moria, Loss of Appreciation of Time and Loss of Moral Sense.

F. X. DERCUM (" Journal of Nervous and Mental Diseases," 1908) :

D. P., age fifty, clergyman ; family history and previous history good. Only signs he noticed was failing sight and headache. His friends, however, observed the following changes : " He appears to be easily pleased and is of an easy disposition. He was at one time exceedingly active and interested in his clerical duties, but now is indifferent to his duties. He never worries about anything. He used to be very conscientious, but now is apt to take everything as a joke. He is never serious. Formerly he was very punctilious, but now he is careless in regard to keeping his appointments and indifferent as to beginning his services at the right time. He has done various erratic things, such as visiting his friends and forgetting altogether the proprieties as regards the length of his stay. He would remain all day and once stayed even for weeks. This conduct contrasted strongly with his former habits." Later on he deteriorated morally. When asked to undress, it was found he had not a single undergarment upon his person, and when asked to explain why he had dressed himself this way, he did not seem to realise that he had done anything unusual. Post mortem, an enormous tumour was found involving both frontal lobes to about an equal extent. These lobes had suffered extensively from compression and loss of the white substance ; while the convolutions, especially the anterior and orbital portions of the first and second frontals on either side, had been much thinned. The tumour upon microscopical examination proved to be a sarcoma.

Case of Frontal Tumour with Euphoria and Moria.

W. CAMPBELL (" Monatsschrift f. Psychiatrie u. Neurologie," 1910) :

Man, age thirty-seven, suffering from tumour involving both frontal lobes, the

right almost completely destroyed. The symptoms were : bad memory for recent events, confabulation, moria, indolence, sleepiness, and violent headache. He had no hallucinations and was not demented. He went blind.

Case of Frontal Tumour with Exaltation.

V. MAGNAN (" Revue Mensuelle de Médecine et de Chirurgie," 1879) : reports a case of exaltation in which post mortem a tumour was found in the ascending frontal convolution about its middle third.

Case of Frontal Tumour with Exaltation and Excessive Hopefulness.

F. LALLEMAND (" Récherches Anat.-pathologiques sur l'Encéphale ") :

Jean Bailly, age sixty, after some ill-treatment by soldiers, had several paralytic seizures which passed off. Coincidently his character changed. He developed an excessive " hopefulness," a blind belief in obtaining a considerable fortune, and planned great enterprises. One characteristic deformity was observed : his mouth was drawn up on the right side. Post mortem, a tumour was found, the size of a large egg, on the posterior surface of the right frontal lobe.

Tumour of Frontal Convolution with Exaltation.

SIEMENS, " Berliner Klinische Wochenschrift," 1888.

Frontal Tumour with Exaltation, Optimism, Dementia.

J. B. F. BAILLARGER, " Annales Médico-psychologiques," 1881.
THOMAS LYLE, ibidem, 1883.
TARGOULA, ibidem, 1890.

OTHER LESIONS

Cases of Frontal Lesion with Euphoria.

ALFRED GORDON (" Journal of American Medical Association," 1907) :

J. M. H., age thirty-four, " when asked where he was, replied 'in Paradise.' Every act and word expressed enchantment. He would joke with strangers. He expressed pleasure at anything offered him. Any article of food tasted delicious." Post mortem was found hæmorrhage in left frontal lobe.

L. PIQUÉ (" Soc. de Chirurgie,") 1910 :

H., age fifteen, fell from a train, sustaining a comminuted fracture of right frontal bone. Three months later developed excessive gaiety, laughing incessantly.

Case of Exaltation with Loss of Moral Sense.

CHARLES W. BURR (" Journal of American Médical Association," 1907) :

A woodworker, age thirty-five, had his left frontal bone fractured in a railway accident. In a few weeks he became grandiose, careless as to money, and obscene.

Burr mentions several other cases of apparently focal lesions, but gives no details as to their locality.

Cases of Frontal Lesion with Exaltation.

MARANDON DE MONTYEL (" Annales Médico-psychologiques," 1877) :

In a patient suffering from *délire des grandeurs* there was found post mortem inflammatory adhesions of the meninges to the left ascending frontal convolution.

KRAFFT-EBING (" Traumatic Insanity," Erlangen, 1868) :

G. B., age twenty-nine, farmer, fell from his carriage on the left side of the vault of the skull. He developed mania of exaltation. Death six years after the accident, when two sequestræ were found in left ascending frontal convolution.

L. MARCHAND (" Soc. Anat.," 1905) :

Patient hit by a stone on the head when four years old. Exaltation delirium set in at fifteenth year and continued till death at age of sixty-three. P. M. softening of left ascending frontal convolution.

MENDEL (quoted by Paul Guder, " Geistesstörungen nach Kopfverletzungen," 1886) :

Man, thirty-six years old, good history, was hit with a pistol on top of head. Scar two and a half inches long at sagittal suture parallel with coronal suture. Paresis of arm, aphasia, exaltation. Post mortem, the cranium was found thickened in the region mentioned with exostoses ; blood-extravasation with pseudo-membrane internally.

Case of Frontal Lesion with Exaltation and Euphoria.

V. MAGNAN (" Revue Mensuelle de Médecine et de Chirurgie," 1878) :

The patient, a butcher, age fifty, showed, a few days before admission, excessive activity in making exalted plans, and was possessed by an abnormal cheerfulness and optimism. Post mortem was found a symmetrical lesion in the middle 3-5th of each ascending frontal convolution, the active congestion extending to half the middle and lower frontal convolutions.

EXAMPLES OF SURGICAL TREATMENT

Case of Frontal Tumour with Loss of Induction and Deduction, and Recovery after Surgical Operation.

This case should be compared with those of lesions in other parts of the frontal lobes, especially with that of Abel and Colman (p. 108), which, it will be seen, produce no loss of judgment and reason, but intellectual deficiencies of another kind.

WILLIAM ELDER and ALEXANDER MILES (" Lancet," 1902) :

Patient, a man, age forty-seven, had a tumour of the left pre-frontal lobe exactly under the frontal eminence, which was swollen. As regards the affection of his memory, it appeared to be not so much a blotting-out of his past impressions as a want of power of associating memories, of comparing and contrasting them. Loss of power of forming a judgment about anything and loss of attention were prominent symptoms of his mental condition. He could not compare or contrast two things or ideas. His individual memories seemed all right. He recognised objects and friends. His emotional condition was another prominent symptom in his case. He lost the sense of modesty and shame. There was evidently loss of inhibition. The skull was trephined, the tumour was removed, and the patient's symptoms rapidly disappeared.

Case of Frontal Injury with Symptoms of Exaltation, and Recovery after Surgical Operation.

BARTON and GAYTON (" British Medical Journal," 1891) :

A woman, age thirty-nine, married, no family. There was a history of a blow on the head received whilst running upstairs, when she knocked her head against the top of the doorway. This spot, which was the seat of very great pain and headache, was selected for the operation, namely, one inch to the right of the middle line and one inch behind the coronal suture. Patient had exalted ideas of wealth, delusions as to possessing carriages and horses, etc. There were no convulsions previous to the operation, but there were two afterwards. A fortnight later she began to improve, and from that time made a steady recovery. The delusions and headache were both cured. Before the operation she wrote badly and incoherently ; after the operation her handwriting improved, and she wrote a reasonable letter. She was discharged.

Case of Surgical Treatment of General Paralysis of the Insane.

T. CLAYE SHAW (" British Medical Journal," 1891) :

A man, age thirty-six, a packer at the Army and Navy Stores, had, when admitted, grandiose delusions, and was impaired in both gait and speech. He was

trephined by Mr. Harrison Cripps. The operation was carried out on the right side of the head about the middle of the post-central convolution, and consisted of making two one-inch trephine holes, about two inches apart, and removing the intermediate bone. There was considerable bulging of the tissues beneath the opening, indicating pressure. The underlying dura mater was removed, and the pia excised. A considerable quantity of fluid drained away, and the opening was then closed by replacement of the skin. Mental improvement followed, the intellect was clearer, patient became coherent, and had no delusions. He died suddenly in convulsions. At the post-mortem examination it was found that the trephine hole was completely filled up by a tough fibrous membrane. On the under-surface this membrane was adherent to about the size of a shilling to the cortex of the middle of the *ascending frontal* convolution.

Another similar case by the same author (*ibidem*, 1891).

THE FRONTAL LOBES AS CENTRES OF INHIBITION.

THE MORAL SENSE

Let me lay stress on the fact that **the frontal lobes act as centres for inhibition** —that is to say, they enable us to exercise control over our feelings and impulses. In injury or disease of the frontal lobes, therefore, will the intellect be affected, or some elements of it ; but more manifest still will be the loss of inhibition over the natural dispositions of the man, in consequence of which they will be manifested in a much exaggerated manner. This accounts for the inaccurate statement so often made that frontal lesions may be accompanied by almost any symptom—irascibility, depression, suspicion, etc. These manifestations are not the symptoms ; the only diagnostic symptom is the loss of control over the natural tendencies.

The frontal lobes, containing the centres for the reasoning processes, act as an inhibitory apparatus against the lower and more instinctive innate impulses. The more developed the frontal lobes are, the more they overbalance the rest of the brain—the greater the tendency to subordinate the instincts of self-preservation and the egoistic feelings to the intellect, and to act as check on the animal propensities—the more moral the man. If this inhibition becomes weakened or totally lost, then we see the disordered predominance of the instincts and impulses. These being out of control may lead the passionate man to immoral actions, and the man with strong anti-social impulses to criminal deeds.

It is the highly developed intellect of man which changes the innate animal propensities into glorious faculties. Thus the animal desire of propagating the species is transformed in man to moral love ; the love of female animals for their offspring, provided by Nature to preserve their young, becomes in women the amiable virtue which inspires their tenderness for their children ; the attachment of animals changes in man to friendship ; their sensibility to caresses changes into ambition and a sentiment of honour ; the instinctive building of nests by birds and of huts by beavers is at the root of man's nobler dwellings, of his temples and palaces. It is the frontal brain with its connecting fibres to all the remainder of the cortex to which this difference is due. The larger the anterior lobes in proportion to the rest of the brain, the more refined will be the expression of the emotions, and even of the passions, of man, and the greater control will he be able to exert over them. **Let the frontal lobes be arrested in development, or affected by disease, and man descends to the animal stage.**

From this one might wrongly conclude that the development of the moral sense is in proportion to the development of the intellect. But this is not so, for as everyone knows, there are **moral idiots** as well as intellectual idiots—men born with fair intellect but with an entire absence of the higher moral sentiments, entirely destitute of moral feeling. They are as insensible to the moral relations of life, as deficient in this regard as a person colour-blind is to certain colours, or as one without

ear for music is to the finest harmonies of sound. If caught in an immoral or criminal act, they show no repentance. They may perhaps feel and dread the material consequences of crime, but they are deficient in the feeling of moral guilt. **They are not lacking in intelligence; but their intellect is put to bad use.** This view may go against the convictions of some people; there are magistrates and judges who deny such an assumption. But it is not alone on the basis of the evidence I am about to quote that I assert that moral idiocy is due to a deficiency of a particular portion of brain, but my assertion is based also on evidence, which I am not at liberty to publish—namely, that contained in my case-books, of persons, descendants of well-known families, whose respectability is of repute, whose careers I have been able to watch from infancy and of whose convictions for various crimes I have kept records.

Still, I agree with those who hold that **there are no definite centres in the brain for the manifestation of the moral sentiments.** But there are centres for **adaptation** and **self-control,** and that is what morality amounts to. These centres appear to be in the posterior part of the frontal lobes, which seem to act as a check to all the other centres. The actual locality is of no consequence at present, so long as it is recognised that the moral sentiments may be lost in lesions of some portion of the brain. If a blow on the head can cause such circumscribed mental changes that only the morality of the man deteriorates, while he remains in all other respects as before, it shows that morality or immorality—that is, the tendency to one or the other—depends on brain conditions. And if this be admitted, then we are also justified in assuming that the moral tendencies are subject to the laws of heredity, though environmental influences and education will always discount to a large extent the forces of heredity.

The so-called moral sense is of course highly complex; originating in the social sentiments, largely guided by the approbation of our fellow-men, ruled by reason, self-interest, religious feeling, and experience of the more remote consequences of our actions. But in the course of evolution it has become part of the mental organisation, varying in degree in different people and dependent no longer so much on the approbation of others as on the approbation of self; in other words, it has become—conscience. That it is not the product of a purely reflective faculty we see in children from the earliest age. Some have it strongly without teaching or example; others have it sparingly, and need the most assiduous care to develop it.

F. L. GOLTZ (1834-1902), although an opponent of the localisation theory, was a very accurate observer. He admitted that when the frontal lobes are destroyed the inhibitory power over the emotions and propensities is lost and such an animal changes its character for worse. His dogs that were very docile and good-tempered became, after removal of the frontal part of their brain, easily excited, irascible, made much noise, and were constantly disposed to fighting. In fact, it seems Goltz produced in his dogs symptoms similar to mania in man. ("Die Verrichtungen des Grosshirns," Bonn, 1881.)

J. LOEB found the same as Goltz.

PAUL FLECHSIG (1847-1904) said: "The result of the action of physical impulses upon the cortex is a struggle between sensory impulses and reason. As soon as the power of the mental centres is paralysed, the impulses are deprived of mental control, and passion reigns unbridled." He found in lesions of the frontal association centres that patients "could not distinguish truth from untruth, imagined events from experienced events, possible things from impossible. Ethical and æsthetical judgment diminishes, prudence in the manifestation of the propensities is lost, self-control is lost. Finally idiocy results with loss of personal identity."

CAMPBELL ("Journal of Mental Science," 1904) declared—on histological evidence supplied by LEONORE WELT, and emphasised by v. MONAKOW—that "destruction of what one may call the *middle* part of the frontal lobe gives rise to various disturbances of the moral faculty."

L. F. BARKER, Professor of Anatomy and Pathology in John Hopkins University, said: "When the intellectual centres are paralysed, there often results

most marked disorganisation of the mental processes, and most serious alterations in the character of the individual. The struggle between the lower instincts and the ethical feelings may cease, and instead of a rational man we see a creature given over entirely to the satisfaction of his lower desires."

W. C. SULLIVAN, late Medical Officer H.M. Prison, Holloway ("Lancet," 1911), records two cases of frontal tumour in prisoners and accounted for their crime by the loss of control over the propensities. He ascertained the cause of death in prisoners to be brain tumour in four per cent. of the total mortality, a rather high proportion when it is borne in mind that cases of this disease with distinct physical or mental impairment would not be likely to be sent to prison, or, if sent, would not be detained.

ALLEN STARR, who has studied the mental disturbances following disease of the frontal lobes, gave the summary of twenty-three cases in the *American Journal of Medical Sciences*, 1894 He laid great stress on the frontal brain as an inhibitory organ. He regarded it therefore as the seat of judgment and reason, the highest psychical manifestations. Through the loss of self-control, he said, the attention can no longer be fixed, and the patient can no longer follow the sequence of his ideas. He regarded the loss of attention as important. He said: "The form of mental disturbance in lesions of the frontal region does not conform to any type of insanity. It is rather to be described as a loss of self-control and a subsequent change of character. This action of control implies a recognition of the importance of an act in connection with other acts—in a word, it involves judgment and reason, the highest mental qualities. It seems probable that the processes involved in judgment and reason have for their physical basis the frontal lobes; if so, the total destruction of these lobes would reduce man to the state of an idiot, while their partial destruction would be manifested by errors of judgment and reason of a striking character. One of the first manifestations would be a lack of that self-control which is the constant accompaniment of mental action, and which would be shown by an inability to fix the attention, to follow a continuous train of thought, or to conduct intellectual processes. It is this very symptom that was present in one half of the cases collected. It occurred in all forms of lesions—from injury by foreign bodies, from destruction by abscess, from compression by softening due to the pressure of tumours—and therefore cannot be ascribed to any one form of disease. **It did not occur in lesions of other parts of the brain."**

EXAMPLES OF THE LOSS OF MORAL SENSE

That the frontal lobes represent the higher nature of man is shown in cases of their destruction—or rather destruction of certain parts of the frontal lobes—when all the stock of inherited and acquired sentiments—in fact, man's moral nature—seems to disappear on account of the *loss of the power of inhibition.*

Everyone knows of **the classical "Crowbar Case," recorded by Dr. HARLOW.** It is so typical that it cannot be too often quoted. But it has been misrepresented in many of our text-books as being typical evidence that loss of brain substance may occur without any mental change, simply because moral sentiments are not supposed to be dependent on brain matter. In his work on "The Functions of the Brain," 1876, Sir DAVID FERRIER referred to the case as illustrating the fact that disease or injury to the frontal region in one hemisphere is not followed by any appreciable mental symptoms. However, in his later work, "The Localisation of Cerebral Disease," 1878, he furnished a detailed account of it, proving the contrary. Nevertheless, in Kirkes's "Handbook of Physiology," sixteenth edition, 1900, the crowbar case is still misrepresented, it being said that "no noteworthy symptoms were observed" in the patient "during the rest of his life," indeed, he "returned to his work as overseer to the mine." This is not true, and I am glad to see that in more recent editions the case has been left out altogether.

Another author quotes the case as showing that the patient "lost nothing of mental power or sagacity and was entirely clear in all his mental processes."

The following is the actual history:

"While Phineas P. Gage, age twenty-five, was engaged tamping a blasting charge in a rock with a pointed iron bar, three feet seven inches in length, one inch and a quarter in diameter, and weighing thirteen and a quarter pounds, the charge suddenly exploded. The iron bar, propelled with its pointed end first, entered at the left angle of the patient's jaw, and passed clean through the top of his head, near the sagittal suture in the frontal region, and was picked up at some distance covered with blood and brains. The patient was for the moment stunned, but within an hour after the accident he was able to walk up a long flight of stairs and give the surgeon an intelligible account of the injury he had sustained. His life was naturally for a long time despaired of, but he ultimately recovered, and lived twelve years and a half afterwards." This is what Dr. Harlow says of his mental condition during that period: "His contractors, who regarded him as the most efficient and capable foreman in their employ previous to his injury, considered **the change in his mind so marked** that they would not give him his place again. The equilibrium or balance, so to speak, between the intellectual faculties and animal propensities seems to have been destroyed. He is fitful, irreverent, indulging at times in the grossest profanity (which was previously not his custom), manifesting but little deference for his fellows, impatient of restraint or advice when it conflicts with his desires, at times pertinaciously obstinate, yet capricious and vacillating; devising many plans of future operation, which are no sooner arranged than they are abandoned in turn for others appearing more feasible. **A child in his intellectual capacity and manifestations, he has the criminal passions of a strong man.** Previous to his injury, though untrained in the schools, he possessed a well-balanced mind, and was looked upon by those who knew him as a shrewd, smart business man, very energetic and persistent in executing all his plans of operation. In this regard, his mind was radically changed, so decidedly, that his friends and acquaintances said he was 'no longer Gage.'"

Gage became "very childish." He died twelve and a half years after the accident in epileptic convulsions. The base of the frontal bone was found fractured.

Case of Frontal Injury followed by Moral Insanity.

SIR ROBERT ARMSTRONG-JONES ("Archives of Neurology," 1907):

X. Y., age twenty-six, was admitted to Claybury Asylum from prison. The family history was singularly free from insanity and drink. The patient was in good health and condition, and the organ apparently normal. Traumatism was the assigned cause of insanity, patient having fallen forty feet from a lift and fractured his skull in the pre-frontal region. The forehead showed a linear scar 6 centimetres long, with obvious depression of the right frontal bone. Patient was unconscious for several days after the accident, and there was some loss of brain substance. Six months later some portions of dead bone were removed at St. Bartholomew's Hospital, and after two or three years of medical treatment he was pensioned as unfit for further work in Woolwich Arsenal. Before the accident, patient was bright, energetic, honest and trustworthy, a life-abstainer, and much respected. After the accident there was complete metamorphosis; his career became a record of moral obliquity and mental perversion. He was idle, irritable, threatening and violent; he was three times convicted of indecent behaviour, the last time being detained during His Majesty's pleasure, and after being in prison a month was removed to Claybury.

Case of Frontal Tumour with Moral Degradation, and Recovery after Surgical Operation.

FRANCESCO DURANTE (Rome), "British Medical Journal," 1902):

G. B., age forty-six, a housemaid, was admitted in March, 1896. She had been operated on in May, 1884, for fibrosarcoma of the dura mater compressing the left frontal lobe. "The patient on both the first and second occasion had contracted the habit of excessive license of language, to such an extent as to make highly improper remarks, and when reproved she not rarely broke into oaths. When she presented herself to me for the second operation, her relatives informed me that for several months she had manifested a peculiar perversion of the moral sense, shown

not merely by the use of improper expressions, but by actions void of all decency and absolutely unbecoming in an honest woman." Durante diagnosed a recurrent fibrosarcoma of the left frontal lobe, and an operation found the same adherent to the falx cerebri and extending downwards to the crista galli. He removed the tumour, and the result was a complete cure of all the symptoms.

Case of Brain Lesion at posterior end of superior frontal convolution followed by Moral Insanity.

L. CANALI, " Bulletin de la Société de Médecine Mentale," 1881.

FRONTAL LESIONS WITH RELIGIOUS MANIA

The frontal lobes containing the centres which enable us to exercise control over our natural dispositions, it follows that men by nature religious, when they suffer from frontal lesions, become more intensely religious in their thoughts and conduct. The following are examples of religious mania from lesions of the frontal lobes.

Case of Frontal Lesion with Religious Mania.

JAMES GEORGE DAVEY (" Zoist," vol. i.) :

E. M., a woman, age sixty-four, suffered from religious insanity, the first sign of which was evinced by a love for theological disputes, which eventually became so excessive that she disturbed religious services by calling the minister to order for the opinions he expressed. She subsequently regarded herself as an apostle, and declared she was an instrument in the hands of the Almighty, with which it was His intention to effect extraordinary and great good. Sacred music sent her into ecstasy, and she sometimes fell into a paroxysm during the service at the asylum chapel. Post mortem the brain and its membranes were found healthy, with the exception of a circumscribed part in the superior frontal convolution corresponding to the anterior fontanelle, where the tissues were so firmly adherent to one another that the membranes were torn in liberating the brain.

Case of Head Injury with Religious Mania.

H. SCHÜLE (" Sectionsergebnisse bei Geisteskranken," Leipsic, 1874) :

A labourer, age forty-one, received some twenty years prior to admission an injury on the top of his head which never caused him any inconvenience, though there was a bony deficiency, the size of a florin, one-third of an inch behind the coronal suture in the middle line, where post mortem a piece of iron was found embedded, causing degeneration of the brain substance around. Patient was admitted for mania. Fourteen days after his admission he began the solemn recitation of biblical sentences with increased excitement, so that he had to be isolated. He continued to preach fervently in his cell, and gave Bible quotations with a declamatory voice. His temperature rose. A cold bath reduced it again, and he then began the preaching anew, with a further rise of temperature and quickened pulse. He got generally exhausted by the morning. The fever and the maniacal excitement of a religious character always went together, and no treatment seemed to prove of avail. He died of pneumonia about three months after admission.

Lesion of Upper Frontal Region followed by Religious Mania.

A. P. MILLER ("Medical and Surgical Journal," vol. iv.) :

A clergyman who had neglected his health had a sudden outbreak of insanity. He had called on a notorious drunkard to convert him to better ways, and was turned out of the house by him. This conduct had such an effect on his already excited feelings that he rushed into the public square, holding the Bible in the air, and knelt down praying to God to subdue the obduracy of the sinner's heart, and rising up began most vociferously to exhort people to repentance, for sin had darkened the land, and the judgment of God was coming upon earth. After much difficulty he was compelled to go home, where he ran up to his bedroom, stripping,

and washing himself by dashing basins of cold water over his body, and praying most earnestly "that the waters of life he was now washing in would cleanse his soul from all sin." This process he repeated thrice, and such was the intensity of his conviction respecting his own impurity that each time he determinedly refused to be dressed in the same clothes, because they were unclean. He died twelve days after the event. Post mortem was found hæmorrhage limited to the upper end of the superior and middle frontal convolutions.

Case of Brain Tumour with Religious Mania.

JOHN B. CHAPIN ("American Journal of Insanity," 1862) :

E., male, age twenty-three, single, farmer, no hereditary tendency to disease. Hitherto healthy and industrious. Came voluntarily to the asylum. Suffering from religious mania. Devoted to religious subjects and a religious life. Occasionally a reaction of profanity. Post mortem, a tubercular tumour was found, the size of a walnut, at the vertex of the brain.

Case of Head Injury with Religious Delusions.

E. BROWN ("Alienist and Neurologist," 1883) :

J. K., age thirty-nine, was a quiet and orderly youth before the injury. He entered the army early in the American Civil War, and was struck on the head, where the wound left a cicatrix over the junction of the coronal and sagittal sutures. He remained unconscious for twenty-seven hours. On his return home he was found to have undergone a complete change of character. There was loss of control over his temper, together with religious delusions.

Cases of Frontal Tumours with Religious Mania.

VÖGELIN, "Allg. Zeitschrift f. Psychiatrie" 1898.

GIANELLI, "Policlinico," 1897; two cases of loss of moral and religious sentiments.

THE CENTRES OF APPERCEPTION

The frontal lobes contain the centres necessary for the various elementary apperceptions. As has been explained in Chapter XXVII., we must distinguish in the act of vision between the mere perception of an object and an intelligent knowledge thereof as to its nature and qualities. We must distinguish between acts of pure sensation and the mental acts of symbolic representation. Perception is a complex process, and consists not only of the visual impression, but the impression of solidity, form, size and position, which vision alone would never give without the aid of the other senses. Our various representations, the different impressions made by the senses, would not exist for us without an element which gives them unity and makes them an object of understanding. **Perception is, then, sensation plus intellection.** The sensory ideas, whether visual, auditory, tactile, or other, on entering the domain of consciousness, are studied in all their relations to self and the external world. The visual centre may **see** an object, but the perceptive centre **looks** at an object and ascertains its significance and attributes—their form, size, weight, colour, order, number, etc. It is not enough, therefore, to ascertain that a patient after injury to his brain can see an object; we must also ascertain whether he can see **all its attributes.**

The part of the brain that sees the object is a different part from the one that recognises it. **The centre of sensation is not the centre of perception.** In cortical blindness, NOTHNAGEL (1841-1905), as long ago as 1882, observed that the power of calling up visual images remained unaffected. Sense-deceptions, according to this theory, may be regarded as a disruption in the connecting link between the actual sensory and the co-ordinating centres.

The powers of perception give **retentiveness** as well, and thus supply the raw material for our practical knowledge.

To understand how important a factor memory is in mental operations, we have only to conceive what the mind would be without it. Without memory there would be no past, only a perpetual present, therefore no possibility of comparing past states with present ones. The mind would be the subject of a series of sensations and of nothing more. But with memory, perception is possible ; we recognise the relations between one sensation and another ; we can form ideas ; we can think and feel. Memory is a necessary condition of personal identity ; it is, in fact, as HUME puts it, only another name for consciousness.

It is usual to employ the word "memory" in a general sense to express the property, common to all thinking beings, of preserving and reproducing the impressions they have received ; but psychological analysis and a large number of facts in mental pathology have demonstrated that memory should not be regarded as a single faculty, having a distinct seat. **Every cell of the brain and of the body has its own memory.** If memory were a distinctive power, it would be alike strong for *all* subjects. But as this is not consistent with fact, we are forced to the conclusion that **there is no general faculty called memory,** but that each faculty has its own power of recalling its impressions. One individual remembers existences, another events, a third recalls with ease a train of reasoning, another musical airs, another the faces he has seen or the scenes he has surveyed ; each perhaps weakly remembering something else of the matters now enumerated. **Each of these memories may become lost** in injury or disease of the frontal lobes, while the others remain intact and unaffected in the slightest degree. From this we are led to infer that they must possess anatomical independence.

BIANCHI, of Naples, found that after destruction of the cortex of the pre-frontal lobes in dogs and monkeys not only were memory, attention, and the judgment impaired, but the animals **did not recognise either the places or persons** with whom they had been previously familiar.

GOLTZ found that dogs in whom he had removed the pre-frontal region of the brain acted differently from normal animals. Very remarkable is the following experiment which he made. "If a bone is thrown to the animal at some distance it runs to it with great alacrity, but does not have the sense to stop at the right moment and sink its head, so that it runs beyond the mark, as if it had lost the **sense of distance.** Instead, however, of turning round and looking for the bone in a methodical way, the animal appears to **forget** what it was after, and runs on regardlessly until the bone is lifted and the animal's attention again attracted to it."

WUNDT, admittedly an authority on physiological and experimental psychology, held that perception must take place in a higher centre where all the sensory impressions are co-ordinated—that is, in a perceptive centre, which he locates in the **frontal** lobes.

There exist partial, special, or local memories, each of which has its special domain, and which are so independent that one of them may get enfeebled or disappear, or may develop to excess without the others necessarily presenting any corresponding change.

We have already dealt with the **speech centre.** Here we need refer only to the fact that the **memory for words** may be lost and the memory for tones, number, etc. —and their expression—may be preserved intact.

The ability to recognise the **form of an object,** as well as its nature—the stereognostic sense—may be lost independently. This is recognised by MILLS, HOPPE, and WEISENBURG, but they locate it in the superior part of the parietal lobe ; whereas the cases quoted in the succeeding pages show it to be in the orbital convolutions. The independence of the stereognostic sense—without giving any locality—is also recognised by ROBERT SOMMER ("Zeitschrift f. Physiologie der Sinnesorgane," vol. ii.), BERGMANN ("Allg. Zeitschrift f. Psychiatrie," vol. vi.), and HEBOLD ("Archiv f. Psychiatrie," 1885) on the basis of definite cases.

WILLBRAND observed the loss of **appreciation of time.** FÖRSTER ("Archiv f. Ophthalmologie," vol. xxvi.) observed the loss of the memory for places. GROEUNOW ("Archiv f. Psychiatrie," vol. xxiii.) did the same. Similar observations by Bjernum, Brill, Cohen, Schnelle, etc.

SAMUELSOHN had a case under his charge where, after an apoplectic seizure, the sense of space and light was intact, but the **colour sense** was utterly extinguished ("Centralblatt f. die mediz. Wissenschaften," 1882). STEFFEN ("Graefe's Archiv," vol. xxvii.) had a similar case, and concluded from it "that in the main central organ, the brain, the centre for the sense of 'space' and for the sense of 'colour' are divided, no matter how near to each other they may be estimated, but there is a special centre for each of these senses."

The well-known effects of intoxication by hashish also point to the existence of special centres for the **appreciation of time and space.** The notion of time is completely overthrown, the moments are years, and the minutes centuries. Short distances seem immense. In this illusion a bridge or an avenue appears to have no end, and to be prolonged to unheard-of and impossible distances. In ascending a staircase the steps seem to rise to heaven , a river, whose opposite bank can be seen, appears as large as an arm of the sea. These two delusions last more than twenty-four hours after the injection of the poison.

Idiot children have sometimes talents in special directions, which are all the more remarkable because of their lack of sense in every other direction. We can only explain such natural gifts by assuming that they are dependent on special centres in the brain, which are rich in neurones as compared with the remainder of the cortex. It is not uncommon to find in idiot institutions children with an extraordinary talent for **remembering dates and past events.** Several children under Dr. **LANGDON DOWN'S** care have possessed this faculty to an exceptional degree. One idiot boy never failed to be able to tell the name and address of every confectioner's shop that he had visited in London—and they had been numerous—and could as readily tell the date of each visit. Another could tell the time of arrival of all the children at the institution, and could supply accurate records in relation to it when needed. One boy under Dr. Down's care had a very unusual faculty, namely, the perfect **appreciation of past or passing time.** He was seventeen years of age, and although not understanding, so far as he could gather, the use of a clock-face, could tell the time to a minute at any part of the day, and under any circumstances. Dr. Down tried him on numberless occasions, and he always answered with an amount of precision truly remarkable.

Dr. **E. T. BOLAND** brought before the New England Psychological Society, October 11th, 1887, an idiot-savant, a boy named George, sixteen years old, whose strong point was that he could answer questions as to **calendar dates** in his past life and for a year or two in the future. He had never learned to read, sight being too defective even had his capacity permitted. He was an imbecile in every respect.

Dr. **SHUTTLEWORTH** had in his institution a remarkable case of a young man with a history of congenital imbecility who was able, without much mental effort, to give the day of the week corresponding to the day of the month for several years past and for several years to come. His ready answers were very surprising to strangers.

EXAMPLES OF LOSS OF SPECIAL PERCEPTIONS AND MEMORIES

The author's observation of a case of Loss of Form, Size and Weight, and Memory of Dates and Names.

E. M. J., a farmer, age sixty, received a kick from a horse on his forehead, crushing in the skull at the root of the nose along the level of the eyebrows, the fracture extending upwards to the middle of the forehead, showing afterwards an

unsightly depression at the seat of injury. The patient, who remained in a semi-conscious condition for several weeks after the occurrence, made a gradual recovery, but the following symptoms remained. He was able to walk about and look after his farm affairs, but he found that he had lost interest. It was noticed that he could not learn and observe things as before ; that he could not remember dates, names, or even recognise faces and forms as readily as before. He who could formerly guess at distances correctly could no longer measure them with the eye. Form, size, width, and height seemed changed to him. Formerly a good shot, he could not aim at any object now, a bird in the air appearing a long way off, when in fact it would be near or almost directly over him. Nor could he estimate the weight of cattle, dogs, and horses, at which he was naturally clever before the accident. He spoke rationally and was perfectly normal in every other capacity and disposition, except that he had an inclination to frequent anger without apparent cause. This was the only loss of control that could be ascertained.

Another case of my own observation of Loss of Sense of Size and Weight.

H. B., age fifty-five, a tailor, was hit in a quarrel by a billiard ball over the left eye, fracturing the skull over the supra-orbital foramen. After recovering consciousness, he suffered from agonising attacks of supra-orbital neuralgia, for which he was treated. As regards the mental condition, it has to be noted that the patient lost control over his feelings, and for a time was considered insane. He recovered, however, completely and became a normal man but for the loss of appreciation of size and weight, so that he could no longer cut clothes or fit coats.

Case of Frontal Injury with Loss of Memory of Previous Events, of Forms, Objects, and Places.

H. M. ABEL and W. S. COLMAN (" British Medical Journal," 1895) :

G. T., a sober, well-conducted railway fireman, age thirty-six, was brought to the Peterborough Infirmary with the broken ends of an oil-feeder protruding from his right cheek, a little behind the angle of the mouth. It was stated that in stepping from the tender on to the footplate of his engine, with the oil-feeder in his hand, he slipped and fell forwards, the spout of the oil-can being driven forcibly into his face. He was then quite senseless, but partially recovered consciousness in a few minutes. When he was being placed on the stretcher, someone suggested a coat for his head, and he was sensible enough at that time to say that his own coat was on the engine ; so that the loss of memory, afterwards so conspicuous, was not then present. He reached the hospital quite conscious. The metal spout of the oil-can was firmly fixed in the base of his skull, and required firm traction with forceps to relieve it from the grasp of the bone. It passed upwards and towards the middle line, and the concavity of the spout was directed from the middle line, the end of the oil-can entering the skull at the inner corner of the right eye, reaching up to the middle of the forehead. There was now paralysis of the left side of the face and left arm, while the left leg was little affected. Mental condition : **He could not recognise his wife or his old comrades,** and he had also difficulty in recognising **common objects and their uses.** He did not recognise a fellow-workman who met with an accident and was in a bed next to him for weeks. But what was most remarkable was that **the whole of his life for twenty years before the accident was wiped out from his memory.** He asserted he was a farm labourer, which he was before he worked on the railway. All the memory of the accident was gone, and has never returned. After he left the hospital some previous events did return, but after the lapse of a year there were still five years of which he could not remember anything. The paralysis had nearly disappeared, only the arm was left weak. There was **very little control over his emotions.** He laughed or cried at the slightest provocation. His irritability of temper was said to have increased, and he was often hasty in his language, although not violent. The partial return of his memory seems to have been in part due to the habit of his " mates " coming in and talking to him of the past, and continually reminding him of occurrences which were likely to have made an impression on him. There was still extreme difficulty in retaining in his memory any passing events. If he went out for a walk by himself he was unable to find his

way back, and often **failed to recognise his own house** when he was outside ; and there was also frequent failure to recognise common objects and their uses. There was present therefore a condition of imperception. There was no aphasia at any time, and no difficulty in expressing himself. **His reasoning processes were fairly orderly,** but as, owing to the blanks in his memory, he often argued from false premises, he arrived at ludicrously incorrect conclusions. For example, he occupied one of the houses built by the railway company for their servants, and as he had no recollection of having worked for them for five or six years, he argued that he had no right to be there, and insisted with unnecessary warmth that his wife should pack up and leave the house before they got into trouble for being there.

Case of Frontal Tumour with Disorientation and Loss of Memory and Sense of Time.

F. X. DERCUM ("Journal of Nervous and Mental Disease," 1910) :

I. G. C. L., age fifty-nine, book-keeper. "His wife reported that he had been in a 'dreamy' state of mind for some time and that he seemed to have no idea of time. He often forgets what he is doing. At times he does not seem to know just where he is ; sometimes loses himself in his own house. His wife states further that he does not seem to notice the change in his condition ; that he does not manifest any anxiety about himself. He does not worry and assumes no responsibility regarding his affairs." Post mortem, a sarcomatous tumour was found in the right frontal lobe.

Case of Frontal Tumour with Loss of Memory for Facts and Events.

LEONIDA CANALI ("Rivista Sperimentali de Froniatria," 1881) :

Antoine Ruggeri, age forty-four, a priest, struck his forehead against a wooden post in his house. Remained unconscious for about an hour. The injury and subsequent headache was in the region of the right frontal eminence. A year later mental changes followed. He became loquacious, his memory for facts and events got markedly enfeebled, and his ideas disordered. Gradually he also lost control over his character tendencies, became haughty, irascible, and intolerant. Eighteen months later died in a fit. The autopsy revealed a glio-sarcoma involving the middle of the first and second frontal convolutions on each side.

Case of Frontal Tumour—Euphoria, Loss of Sense of Time, Place and Number.

GABRIEL CHEZE ("Écho Médical du Nord," 1910) :

Marie V., age forty-two, found wandering in a state of nudity, smiled happily, had optimistic notions, no knowledge of time and place, no idea of simple calculation. Died five days later. A large sarcomatous tumour was lying across the orbital plates of the frontal bone, compressing the orbital convolutions, which were partially destroyed.

Case of Frontal Injury—Loss of Sense of Weight and Sense of Resistance.

THOS. LAYCOCK ("Australian Medical Journal," 1893) :

A case of fracture of the base of the skull *just behind the orbits*, there being a fissure about a quarter of an inch in width. The patient, a man, age twenty-nine, was treated surgically. Much lacerated and contused brain substance was removed. On recovery, patient had lost the conception of the quality and position of foreign bodies, their weight and resistance, through the sense of touch.

Case of Frontal Injury—Loss of Sense of Time, of Locality, and of Objects.

J. WENDE ("Allg. Zeitschrift f. Psychiatrie," 1905) :

Patient, age thirty-three, fell off a scaffolding seven feet high, when the right side of his forehead struck an iron screw and he sustained a wound about four centimetres in length. He was rendered senseless, but soon recovered consciousness. Subsequently he frequently lost control over his temper, and there was absolute loss of the sense of time, complete failure of self-orientation, and inability to notice things.

Case of Frontal Lesion—Loss of Sense of Time, Memory of Places and of Objects.

M. JASTROWITZ ("Deutsche Medizinische Wochenschrift," 1887) :

Patient, wife of a major in the army, age forty-two, had a syphilitic scar of three centimetres in length over the glabella above the root of the nose. Though intellectually quite normal, she could not distinguish either time or locality, and mistook objects. The post-mortem examination revealed intermeningeal hæmorrhage at the anterior root of the superior and middle frontal convolutions.

EXAMPLES OF RECOVERY OF MEMORY AFTER SURGICAL OPERATION

Case of Frontal Tumour with Enfeeblement of Perception and Memory—Surgical Operation—Recovery.

GIANELLI ("Policlinico," 1897) :

Patient manifested slowness of perception and confusion of memory. On removal of the tumour complete recovery.

Case of Frontal Tumour with Loss of Memory—Operation—Recovery.

SEYDEL ("Neurologisches Centralblatt," 1896) :

Case of loss of memory, loss of all interest, apathy. Removal of tumour led to complete recovery.

Case of Frontal Tumour with Loss of Memory for Facts and Events—Surgical Operation —Recovery.

FRANCESCO DURANTE, Rome ("British Medical Journal," 1902) :

S. D., age thirty-nine, suffered from "slow perception, mnemonic confusion for remote facts, and abolition of memory for recent facts" On operation, large subcortical gumma involving nearly the whole of the left frontal lobe was removed. Result : "Complete cure of all the symptoms."

ARITHMETICAL ABILITY

There are two things necessary for an ability to reckon rapidly : a powerful memory for figures and a real ability for calculating. The carrying out of long calculations in the mind depends, above all, on the accuracy of the memory for a sufficient length of time. The power to commit a group of objects or a line of a dozen figures rapidly to memory and to call it up again instantly depends on the ease and rapidity with which one can impress it on the mind, on the accuracy with which it is reckoned, and the ease and rapidity with which it can be reproduced. The ease and rapidity with which a number of objects can be impressed on the memory seem limited in ordinary persons to about five at a glance. In regard to a special inclination for mathematics and its relation to ability for calculation, and to other abilities likewise, great diversity is exhibited.

There are those having pronounced arithmetical bent combined with great powers of mental calculation, though not necessarily rapid. Mathematicians are not necessarily distinguished rapid arithmeticians. In fact, they rarely have a liking for mere reckoning.

There are those with inclination and ability for mathematics, including arithmetic.

Those with special inclination and arithmetic solely : (*a*) such as have had no opportunities afforded for cultivating other branches of mathematics ; (*b*) in spite of opportunities afforded ; (*c*) where the talent disappears ere an opportunity for development is rendered possible.

There are children whose apathy nothing would seem capable of arousing, and others, again, who take keen interest in everything, and amuse themselves with even mathematical calculations without any end in view. Still others there are more

rarely than either of the aforesaid groups, who limit their interest to mathematical calculations merely. Strange as the fascination for arithmetic seems, it becomes still more so when it is manifested at an age at which it is normally absent ; strangest of all is the union of ability with the inclination. The great calculators showed precocity for figures at three years of age, some at six, and most of them before ten years of age.

One peculiarity in the imaginative powers of arithmetical prodigies is worthy of notice, namely their visual imagery, their capacity of carrying a vivid mental picture—a photograph—of the numbers, with which they are at the time occupied ; and this without a corresponding visual memory for words.

Among the **great arithmetical prodigies** are :

NICKOMACHOS, of Gerasa (*ca.* 30 A.D.), mentioned by Lucianus.
THOMAS FULLER (1710-1790), the Virginian calculator.
JEDEDIAH BUXTON (1707-1772), of Derbyshire, England.
ANDRÉ MARIE AMPÈRE (1775-1836), of Marseilles.
CARL FRIEDRICH GAUSS (1777-1855), of Brunswick.
RICHARD WHATELY (1787-1863), Archbishop of Dublin.
ZERAH COLBURN (1804-1840).
VITO MANGIAMELE (*ca.* 1837), of Sicily.
ZACHARIAS DAHSE (1824-1861), of Hamburg.
C. GRANDMANGE (*ca.* 1852), of Paris, born without legs or arms.
HENRI MONDEAUX (1826-1862).
GEORGE BIDDER (1806-1876), engineer.
TRUMAN HENRY SAFFORD (1836-), of the United States.
JACQUES INAUDI (1867-).

Gall observed several calculating boys of his time and located the centre of the sense of "number" (Zahlensinn) at the inferior and external root of the frontal convolutions, a point which from his brain plates I make out to be the supra-orbital end of the third frontal convolution, corresponding to the external angle of the eye.

He exhibited a boy from St. Poelten, near Vienna, son of a blacksmith, who had received no teaching, but was quicker in calculating rows of figures by head than others were on paper.

A barrister consulted Gall about his son, age five, who busied himself extensively with numbers and calculations, so that it was impossible to fix his attention on anything else.

Gall knew also a boy, age seven, named Devaux, whose greatest pleasure it was to go to all the fairs and check off the traders' calculations when they were making up their accounts.

His works contain numerous other examples, including cases of calculating idiots.

The appreciation of number is a primitive sense, but not the capacity for mathematics, which is a complex ability. Yet **P. J. MÖBIUS** (1853-1907), who attempted to revive Gall's doctrines in Germany (see Chapter XVI.), fell into this error. In a lecture delivered at the fifth meeting of Alienists and Neurologists of Central Germany at Leipsic, 1899, he declared : "I have not closed the investigation as yet, but I have got far enough to enable me to say with full conviction, in this localisation Gall was completely right. I have found all his statements correct, and only one thing Gall left unmentioned, that the development of the *mathematical organ* is more often to be observed on the left side." Möbius, in his work, "Über die Anlage zur Mathematik," Leipsic (1900), gave a collection of mathematicians (male and female) from ancient to recent times, with their biographies, psychological analyses, and cranial formations.

PAUL FLECHSIG (1847-1904), at the meeting just mentioned, declared that

probably the faculty of "number" was located in the lowest part of the third frontal convolution; exactly where Gall believed it to be.

A. BINET (1857-1911) had studied Inaudi and Diamandi, who were examined by the Academy of Sciences in Paris. I saw Inaudi in London. A line of figures, casually suggested by members of the audience, was multiplied by another line, and the product given with astonishing rapidity. The cyphers were written on a blackboard behind the performer, so that they could be read by the spectators, but not by Inaudi. Nevertheless he was able to hold in his memory and repeat all the figures. In adding he used to begin at the left side with the higher numbers. He dealt with the numbers as *sounds*—that is, they had to be repeated to him orally—whereas Diamandi regarded them as seen figures. Binet observed that, besides the capacity of keeping the figures in memory and rapidly calculating, it is of importance that the reckoners should keep up the use of their talent; for without practice they seem to lose much of their facility. The possessors of this wonderful faculty generally come of obscure families who never showed particular skill in arithmetic.

Arithmetical ability is not confined to Europeans. In the *Korea Magazine*, May, 1917, is an account by W. CARL RUFUS, Ph.D., of An Myengwhan, a Korean lad, sixteen years of age, in the employ of the Land Investigation Bureau. He is described as a perfect human adding machine. He can add up twenty-five items of four figures each in seven seconds by mental calculation, and when using an abacus the time required by him in making the same addition is eight seconds. Frequently at night he sees columns of figures before his closed eyes.

On the other hand, there are men with a **congenital deficiency in the faculty of number,** for example, George Combe. He said:

"Arithmetic has always been a profound mystery to me, and to master the multiplication table an insurmountable task. I could not tell how much eight times nine are without going to work circuitously and reaching it by means of the tens, yet for seven years I studied arithmetic. The faculty in me is, in fact, idiotic. Were any other powers in like condition, I should be totally unfit for the ordinary business of life."

Arithmetical ability is one of the capacities that cannot be explained by any process of development through the struggle for existence or sexual selection. Yet the arithmetical talent seems to be a special faculty of the human mind. Though all normal children can be taught to count, some learn quickly, others slowly. Some men take a delight in working at arithmetical problems, others have a distaste for them. It often happens that those who are very skilful in solving arithmetical problems have no unusual ability for anything else.

It is curious that in the mental manifestations in **idiocy and imbecility** we find that of all human faculties that of music is the best preserved, whereas that of **number is the most deficient,** yet music seems to have a certain connection with number. A tune depends upon the numerical relation of certain notes to one another, and upon their succession in time. Even idiots who cannot speak catch up tunes and hum or grunt them. To be able to learn to speak is a measure in the capacity of imbeciles, but speech may be freely exercised without there being ability to count. This deficiency is universal, comprising all classes of imbeciles. The old legal definition of an idiot is "one who cannot count twenty pence." The greater number of idiots cannot count three, but among imbeciles are sometimes found children wonderfully skilled in calculations of various sorts, though with no other ability.

Dr. **DESRUELLES,** of the Asylum of Armentières, published in "L'Encéphale," 1912, a very interesting and valuable description of a new case where phenomenal ability in arithmetical calculation is associated with general mental inferiority, if

not actual insanity, and where, further, there is a curious complication in the fact that the patient has been blind from birth, and therefore can have no visual memory. Fleury is a young man of eighteen, who suffered from ophthalmia neonatorum and is completely blind. He has never been teachable in any way, has always proved refractory and difficult to manage, and has passed from an institution for the blind to an asylum. The only thing successfully taught him has been the Braille system, but his capacity for reading thereby is by no means well developed. On the other hand, he has from an early age shown himself exceedingly apt in figures, and partly by persevering with the Braille method, partly by devising certain mental methods for himself, he has reached a stage of extraordinary facility in performing elaborate calculations, the extent of which is limited only by his difficulty in remembering any set of figures beyond six. Psychologically the case is of great value, for it must be remembered that Fleury has no visual memories at all, and on questioning him he denies that he uses his auditory memory to any extent. It is clear that his tactile memories are so remarkably developed that by them alone, coupled with certain other processes, he is able to perform mental feats of an astonishing kind. When he calculates he uses his fingers constantly, as though he were feeling the familiar raised Braille figures with them, and while he mutters to himself as he does this, it is not figures that he is repeating, but such fragments as "that makes . . ." "then . . .", "added to . . .", etc. All of Fleury's calculations are mental; he does not repeat figures with his lips. Here are some examples: He multiplied 825 by 825 in four seconds; given a day of the week in 1912, he calculated May 22nd, 1908, as a Friday, in five seconds; asked how many seconds in 39 years, 3 months, and 12 hours, he gave the correct answer, 1,238,587,200, in 1 minute 15 seconds.

A. WIZEL ("Archiv f. Psychiatrie," 1904) described a phenomenal talent of counting in an imbecile:

Sabina W., age twenty-two, inmate of a hospital at Warsaw. The family had a special gift for music, but none for arithmetic. Patient normal till seven, when she had severe epileptic fits, followed by unconsciousness lasting for several days, leaving her an absolute imbecile. When she was eleven she was mentally the equal of a child of three. The epileptic seizures continued, though in a milder form, but they were followed by fits of violence. At the age of twenty-two she was still weak-minded. She could not tell how old she was, or how many brothers and sisters she had; she could not read or write, could not read figures, and could only talk on childish subjects. She had no affection for anybody and could not keep herself clean. But she had remarkable faculty for arithmetic, being especially good at multiplication and division. She divided 576, 560, and 336 by 16, and 225 and 270 by 15, with astonishing quickness; yet she failed in simple addition and subtraction, giving often the right answers, but much more slowly. Sabina possessed another power which is rarely met with in ordinary people. Once Dr. Wizel asked her: "What is the product of 23 × 23?" She quickly gave 529, and added, "That comes to as much as 33 × 16 and 1." Dr. Wizel gives numerous other examples. It was difficult to get Sabina to explain by what processes she so rapidly got her answers; but one example may explain. Asked 45 × 18, she answered 810; Dr. Wizel thinks she multiplied 90 by 9.

Case of Head Injury with Loss of the Faculty of Number.

K. RIEGER ("Centralblatt f. Nervenheilkunde," 1887) showed at a meeting of the Medical Association at Wurzburg a patient, Mr. Seybold, a sculptor of Carlstadt, who received a fracture of the base of the skull in a railway accident. Patient spoke a bit slowly, and was weaker in his memory than before the accident, but the chief symptom was, that he had forgotten all ideas of figures beyond 1, 2, and 3.

Case of Aphasia with Retention of Expression of Figures.

VOLLAND ("Münchener Medizinische Wochenschrift," 1886):

A farmer's son, age fifteen, had a fall which injured the scalp but not the bone. When he recovered consciousness, after several days, he understood everything that was said to him, but could only reply one word, "Anna," by speech or in writing.

Yet he was able to count up to 100, to recite the multiplication table, and to add or subtract figures. He could write all figures and calculate correctly on paper. Gradually he acquired the power to speak whole sentences, but did not get on well at school, except in arithmetic, in which he was equal to the best. Six years after the accident he was still somewhat aphasic, had attacks of giddiness and slight ptosis. This case shows that **the formation and expression of words must be anatomically separate from the formation and expression of figures.**

Another Case of Aphasia with Retention of Expression of Figures.

SCHRÖDER VAN DER KOLK ("Pathology and Therapeutics of Mental Disease," p. 14):

A tradesman came, conducted by his son, to obtain the doctor's advice. About half a year back the father had an apoplectic attack of only short duration and which left no paralysis; yet the memory for names or words had in a great measure vanished, so that he called objects by wrong names, and, for example, used the word "chair" when he meant a table. Yet he well knew the word "chair" was not the usual one, and he brought forward other words until at last he came to "table," which word he then pronounced with great satisfaction. But there was yet another remarkable suppression, such as the doctor had not before observed. The patient was no longer able to read, although the sight was not impaired. On a large printed book being placed before the man, he distinguished the letters in it quite well, and spelt, for example, the word "towards," but he was not able to combine these letters into a word. The man had also lost the capacity of writing, so that he could no longer sign his name. But the most remarkable circumstance with this patient was, that he could still, according to the assurance of his son, keep his ledger and *reckon* now as ever before.

Other Cases of Aphasia with Retention of Expression of Figures.

MARCÉ ("Gazette Médicale de Paris," 1856):

Case 11. Patient distinguished single letters quite well, but was no longer able to combine them into a word. He transcribed a word quite correctly, but could not write it when it was dictated to him. *Yet he could write figures very well.*

Case 7. The patient could not write his name from memory, but wrote figures and solved complicated arithmetical exercises, always setting the figures in their proper places.

OTTO HEBOLD ("Allg. Zeitschrift f. Psychiatrie," 1894):

H. G., had loss of speech but could calculate correctly.

PRINGLE MORGAN ("British Medical Journal," 1896):

Recorded a case in which the memory for words and letters was lost, but not that for figures; from which he infers that there is not only a complete functional independence of these two faculties, but also an anatomical independence.

HEILLY and CHANTEMESSE ("Progrés Médical," vol. xi.):

A case of sensory aphasia with the power of calculation preserved. Authors mention that patient could play écarté correctly.

A. CHAUFFARD ("Revue de Médecine," 1881):

Case of sensory aphasia. Had a tendency to substitute *numerals for words.* His appreciation for music was well preserved, though he complained that he could not hear words.

DÉJÈRINE ("Comptes rendus des séances de la Société de Biologie," 1892):

Patient, although word-blind, could write as fluently as ever. He could copy correctly pages of manuscript, although he could not read a word he had written. He had also lost the power of reading musical notes, but he could still sing well. *He could read figures* and do mental calculations just as well as ever.

BRANDENBURG (Graefe's "Archiv f. Ophthalmologie," 1888):

A hitherto healthy man had an apopleptic stroke, which made him temporarily aphasic. There was alexia but no agraphia. The patient could write anything but could not read, with the exception of figures, so that *the reading of numbers was preserved.*

M. LANNOIS ("Lyon Médical," 1898):

Patient, age thirty-two, had been for three years in a condition of complete amnesia, with the exception of the memory for figures. He could not write spontaneously anything except figures, and *calculating remained his only occupation.*

JAMES HINSHELWOOD ("Lancet," 1895):

A teacher of languages, age fifty-eight, who had of recent years a large amount of mental work and, before his present visual difficulties appeared, considerable mental worry and anxiety, found suddenly one morning that he could not read the exercises as usual. Greatly puzzled, he took up a printed book, and found that he could not read a single word. On examining his visual acuity, Dr. Hinshelwood found that he was unable to read even the largest letters of the test types. Patient informed him that he could see all the letters plainly and distinctly, but could not say what they were. What attracted special attention was the fact that the patient *read at once the number* standing at the top of each paragraph of the test types. On examining him further, it was found that he did not experience the slightest difficulty in reading any number of figures quite fluently and without making any mistakes whatever. He could read figures printed on the same scale as Jaeger No. 1, the smallest of the test types, and from other tests it was evident that there was no lowering of his visual acuity. The inability to read was thus manifestly not due to any failure of visual power, but to a loss of the visual memory for letters. The page of a printed book appeared to him exactly as it appears to a person who has never learned to read. He saw each individual character distinctly enough, but the character was no longer a visual symbol, as he no longer remembered the special significance attached to it. His difficulty with written characters was equally well marked. He could write with perfect fluency and ease to dictation, although afterwards he could not read what he himself had written. He spoke as fluently as ever. Patient was tested further with large combinations of figures, and all these were read with the greatest fluency, and without any hesitation whatever.

Cases of arithmomaniacs—patients dominated by an irresistible impulse to count everything and to make useless calculations—while otherwise of normal intellect and conduct, have been reported by TRÉLAT ("La Folie Lucide"), A. CULLÈRE ("Annales Médico-Psychologiques," 1890), and LUDWIG BRUNS ("Neurologisches Centralblatt," 1891).

MUSICAL ABILITY

It would be difficult to settle what are distinct talents or innate gifts, but it will scarcely be denied that the musical talent is one of them. Nevertheless, it is made up of a number of elements, of which the principal one is the **sense of appreciation of tones.** The appreciation of sounds alone is not music. Music is a harmonious arrangement of sounds. The "time" sense among other factors is required to appreciate it. The lowest species of musical gift is the simple pleasure derived from hearing music, then that of remembering tunes, and of singing and performing. The title of musical genius is often reserved for great composers, but many great performers who cannot compose are spoken of as possessing musical genius. Between the highest and the lowest it is but a question of degree.

In persons who, in common language, have no ear for music, there is not deafness properly so-called, but an inability of the nervous structure to appreciate the minute vibrations which are caused by the more subtle differences in or among musical sounds.

Sir ASTLEY COOPER mentioned the case of a man who was very deaf from childhood, and who, notwithstanding, appreciated harmony; this person played well on the flute, and performed with great success in concerts. DARWIN knew a child who loved music extremely, who easily retained an air after hearing it sung distinctly, and whose organ of hearing was yet so imperfect that it was necessary to speak very loudly in addressing him.

Memory of tune is a very common faculty among the feeble-minded. They readily acquire simple airs and rarely forget them. The turn for music is quite disproportionate to their other mental faculties, and not unfrequently those who cannot speak at all can hum tunes correctly. This remarkable relative development of the musical sense in the feeble-minded is the more striking on account of the utter absence of any other evidence of artistic taste. A beautiful landscape or a lovely picture is powerless to move them.

The following casts, taken from living heads—all contemporaries—were in Gall's collection: Beethoven, Mozart, Haydn, Glück, Liszt, Kreibig (the accompanist of Emperor Joseph II.), Marchesi, Catalani, Rossini, and numerous others whose names would not be known at the present day except by persons intimately acquainted with the history of music. In his "Atlas of Brain Plates" he places the centre for the appreciation of the relation of tones over the fissure of Sylvius, in the upper and lateral part of the brain, corresponding in the skull to the temporal region bordering on the supra-orbital ridge, which part, when prominent, as in musicians, appears broader than the inferior part of the forehead between the external angles of the eyes. Gall analysed the history of Handel, Mozart, and other musical prodigies; described the musical disposition as it exists sometimes in idiots and the insane, and examined the differences in brain structure of singing and ordinary birds.

How correct Gall was in recognising singing-birds by the shape of the head is related by PRINCE METTERNICH (1773-1859), the famous Chancellor and life-long patron of Gall, who used to accompany him to the Central Market in Vienna for the selection of singing-birds. To illustrate Gall's capacity we might mention also a mask in his Paris collection, labelled "Liszt: A mask taken from the living head. A young Hungarian, who very early displayed a great talent for music, and cultivated it with enthusiasm. The formation of the tone-centre is very striking in the mask." Gall's successor, FOSSATI, who had also examined Liszt's head, reported ("Lancet," 1834) "although the shape of the forehead of Liszt has some analogy with that of Weber, yet he feared this young artist, with all his talent, was not capable of producing anything to be compared with works of a higher worth." Those who have known Liszt in his later days can certify that this prognosis, founded entirely on the shape of the head when Liszt was still a youth, was quite correct. Liszt remained one of the best performers, but his compositions were of minor value.

BLIND TOM, as Thomas Wiggins was known throughout two continents for his wonderful musical genius, was little more than a child of feeble mind in all relations of life except that of music. He reproduced with an exactness little short of the marvellous what he heard immediately before the reproduction. But the wonder was that, once having reproduced the execution of a musical composition, he never afterwards lost memory of it. He also composed some pieces of his own. He never, outside of music, rose above the intelligence of a child of six. His passion for music began when two years old, and he never lost it until a few days before he died, when he was stricken with apoplexy. In his retirement he spent eight hours of each day at the piano. The rest of his life was a blank. He made fortunes for his owners and guardians. He died in 1908, in his sixtieth year. He was of the pure negro race, born in Georgia, a slave. His mother was bought by Col. James N. Bethune in 1850. She carried in her arms at the time a babe blind and so feeble that, in the sale, the babe was thrown in with the mother. He was the wonder of America and Europe, and although he was almost an imbecile in everything but music, in this he showed extraordinary talent.

Dr. **LANGDON DOWN** had an idiot boy under his care who could tell the time, besides the words and number of nearly every hymn in *Hymns Ancient and Modern*. Another boy in his care, if he went to an opera, would carry away a recollection of all the airs, and would hum and sing them correctly.

ESQUIROL (1772-1840) already had called attention to the fact that even idiots without the power of speech can sing.

WILDERMUTH ("Allg. Zeitschrift f. Psychiatrie," 1889) estimated that the musical capabilities are well developed in one-third of even badly speaking idiots, and though first-class musicians predominate amongst normal children, second, third, and fourth-class musical capacity existed more frequently amongst idiots.

In insanity the musical faculty is often the last one to go.

For example, Sir **JOHN BATTY TUKE** (1835-1913), "Journal of Mental Science" (1891), had two lady patients who, though quite incoherent in speech, played with great accuracy on the piano, the one by ear, the other by reading music, although the latter was quite unable to read a book, and had not dressed herself for twenty years.

Music thus appears to be a rudimentary endowment which demands a much lower capacity than that of speech, and is less liable to be destroyed in mental decay.

The appreciation of musical sounds appears much earlier in life than the appreciation of words. Children may sing, perceive and enjoy music before they speak. Dvorak's son manifested great delight at the sound of music when three months old, and retained the memory of melodies when one year old. That speech is unnecessary for the learning of melodies is also evidenced by birds—for instance, the bullfinches. Moreover, that the musical capacity is independent of the speech centre is shown by the loss of musical perception and of the ability to sing without the simultaneous loss of speech and the power of understanding spoken words. It is only within the last few decades that attention has been drawn to the fact that the musical capacity may be lost from various pathological causes, and, further, that musical aphasia may occur either in conjunction with ordinary aphasia or be independent of it.

Cases are on record in which the patients, though "word-blind," still retained the power of reading musical notes. In other cases there is loss of the visual memory for musical notes, though they can read words. The patients can see the notes as usual, but they have no longer the faintest idea of their significance. They may be able to read the words of a song, but can no longer read the accompanying music.

Similarly there may be deafness for spoken words without deafness for musical tones, or the reverse; or there may be complete deafness for both. The notes are heard, but simply as sounds, without the patients being able to assign to them their position in the musical scale.

H. OPPENHEIM ("Charité Annalen," 1888) found that many aphasics retain their musical faculty and are able to recognise and appreciate melodies and music when they have lost the power to understand language, and were able to sing sometimes even with words they could not speak; others could read or write notes when they could not read or write words. He published clinical notes of seventeen cases of aphasia in which the musical faculty had been the subject of careful inquiry. The general result of these observations was that the musical faculty survived the loss of speech in aphasia, though in some patients the other mental powers were evidently injured. After the memory for melodies, the memory for numbers was found to be the best preserved. One patient, though he could not read ordinary letters, and could not write to dictation, nor copy writing properly, could quite well read and copy musical notes or write them to dictation.

A. KNOBLAUCH ("Deutsches Archiv f. Klinische Medizin," 1888), who introduced the term "amusia" for the loss of the musical sense, cites the case of a little girl, Lizette S., age six, who had right hemiplegia with aphasia. The child could not speak at all at first. Later on she said "mamma," and apparently repeated a few words. She could sing the song "Weisst Dy wie viel Sternlein stehen," etc., but she could not recite the text of the song, or speak voluntarily single words of the same.

L. v. FRANKL-HOCHWART ("Deutsche Zeitschrift f. Nervenheilkunde," 1891) studied the injury to the capacity for musical expression in five cases of aphasia. In all of these the musical power was less injured than that of speech. Some of them could sing words which they could not speak. Two could play from the music-book, one the violin, the other the piano, but they could not sing from it.

J. B. BOUILLAUD (1796-1881), "Bulletins de l'Academie de Médecine," vol. xxx., almost a century ago, made the observation on a patient, age fifty, who had lost the memory for words almost entirely and could speak and write but little, that he could compose an original tune, watch carefully when it was played to him, and sing the words correctly to the accompaniment.

J. P. FALRET (1794-1870), in 1867, called attention to the fact that many aphasics who are unable to speak are still able to sing; some without words, but others with the words that they are unable to speak.

E. C. LASÈGUE (1816-1883) had an aphasic and agraphic patient who could write down a composition with ease after hearing it played to him.

BALLET, in 1886, described musical aphasia, agraphia, and musical deafness.

BRAZIER cites some cases in which there was no aphasia, but the patients could not distinguish musical airs with which they were usually familiar.

EDGREN, of Stockholm, published in the "Deutsche Zeitschrift f. Nervenheilkunde," 1894, a collection of fifty-two cases of aphasia without amusia, and pure amusia without aphasia, showing the anatomical independence of the centres for speech and appreciation of tones.

Other observers of the independence of the tone sense are Stumpf, Stricker, Wallaschek, Blocq, Brissaud, Donath, Wurtzen, Marinesco, Lichtheim, Kahler, Pick, Wernicke, Anton, Larionow, Hughlings Jackson, Gowers, Grasset, and Hallopeau.

Some observers assume that amusia may be situated in the anterior part of the first temporo-sphenoidal convolution, in front of Wernicke's area for word-deafness, but I am inclined from a study of the evidence to seek the centre for the appreciation of the relation of tones in the small anterior convolutions within the folds of the fissure of Sylvius that lie between the inferior frontal and superior temporal convolutions. Its definite localisation, however, must be the subject of future investigation. Here we must content ourselves in bringing the literature concerning this problem and records of cases together.

PAUL FLECHSIG (1847-1904) discovered the end stations of the cochlea nerves in this region, and this localisation would also harmonise with Ferrier's observations.

PROBST ("Archiv f. Psychiatrie," 1899) locates the tone-centre in the most anterior parts of the left temporal lobe.

URQUHART ("Journal of Mental Science," 1904) found the lesion in a case of loss of musical capacity at the tip of the temporal lobe.

BRONISLAWSKI ("Contribution à l'étude de l'amusie et de la localisation des centres musicaux. Thèse de Bordeaux," 1900) locates the sensory centre for music in the anterior two-thirds of the first temporal convolution and the anterior half of the second; and the motor centre for singing in the second left frontal convolution. He maps out several other centres for the different varieties of musical capacity, very much as others have located the various forms of aphasia all over the brain. He has even a special centre for *wind instruments!* It is this sort of localisation that makes the whole problem appear ridiculous.

MERCIER and **NEWINGTON** ("Journal of Mental Science," 1907) argued that the tone-sense cannot be localised.

Case of Frontal Injury with Loss of Tone Sense.

J. G. EDGREN ("Hygeia," 1894):

The patient, thirty-four years of age, on August 31st, 1890, knocked the side of his forehead against a lamp-post so that he fell to the ground. He complained of headache afterwards, of imperfect sight, of vomiting, of difficulty of speech, and

abnormality in the sense of taste. At first he could not eat at all. The next few days he took some water only, because he felt as if all food were remarkably hot; even the water he drank appeared hot. After a week he began to eat, but he now complained that all the food was too much salted. On September 17th patient came home after a visit to several concert halls and declared he could not make out the music. He had tried several places intentionally, but though he could hear the music, it did not sound as usual, but more like an indefinite noise, so that he could not make out the melody. The reply his wife gave him he could not understand, and he himself spoke no more for two days. On September 20th he began to speak again, but in so confused and disconnected a manner that it was almost impossible to understand him. Admitted to hospital on September 23rd. He was word-deaf. He could hear when someone was speaking to him, but without understanding the words spoken. Written communications he apprehended immediately, and he could still calculate. He heard equally well on both sides; he could hear the ticking of a watch at seven centimetres distance. His sense of smell was reduced; he could not smell spirits or vinegar. On October 5th his sense of smell and taste were perfectly normal. His defects were therefore only temporary, with the exception of his tone-deafness. He left the hospital on November 3rd. Before the accident he had a good musical ear, which had now vanished, so that orchestral music was to him mere noise, and he could not distinguish a waltz from a polka or march. He used to sing to his children, but now when attempting to do so he failed, and lost the melody. On March 17th, 1893, he was readmitted for bronchitis and an eruption of purpura. Intellect quite normal; no traces of aphasia, no word-deafness, only tone-deafness. The post-mortem examination revealed destruction of the anterior two-thirds of the first temporal convolution, and the anterior half of the second temporal convolution of the left hemisphere.

Case of Frontal Injury with Loss of Musical Capacity.

G. A. KÖNIGSFELD, of Aix-la-Chapelle ("Zeitschrift f. Physiologie," Heidelberg, 1843:

J. Trump, a singer, age eighteen, received a kick from a horse, resulting in a fissured fracture of the frontal bone, the fissure running from the outer corner of the left eyebrow upwards along the borderline of forehead and temple. The particles of bone were pressing on the brain, and the brain itself was contused. The wound suppurated, but got well after surgical treatment, a broad, deep scar being left. The patient had not suffered in intellect after his recovery, but had lost the memory of all the tunes he formerly knew.

Case of Head Injury with Loss of Musical Capacity.

A. KAST ("Deutsches Archiv f. Klinische Medizin," 1888):

A youth, age fifteen, fell from a cart and struck his head against the wheel. The accident was followed by loss of consciousness, which lasted several hours, and on restoration to consciousness it was found that the right side of the body was paralysed, and that, though he seemed to comprehend what was said to him, he could not utter a word. The paralysis slowly disappeared. At the end of two months the aphasia had altered its character. The boy was no longer unable to speak, but he had completely lost the artistic use of his vocal cords, though prior to his accident he was a distinguished member of a choral society. He sang discordantly and quite out of tune, and could not correctly follow the lead of another singer.

Case of Head Injury with Temporary Loss of Musical Capacity.

THOMAS D. SAVILL ("Clinical Lectures on Neurasthenia," 1908):

Mrs. Z., age forty-one, a professional singer and pianist, was struck severely on the left temple by falling glass from a seventh-floor window. She complained of loss of memory, confusion of thought, and complete inability to sing or play the piano. She could remember ordinary matters well enough, but found herself utterly unable to read a single note of music or to recognise delicate shades of

intonation. At the time of the injury there had been a good deal of swelling and bruising over the left temple, but no fracture anywhere. Extreme tenderness continued. The loss of memory for musical signs persisted for over a year.

Case of Frontal Lesion—Aphasia—Musical Sense Preserved.

BERNARD ("De l'Aphasie," Paris, 1889):

Lady music-teacher, age forty-five, had an apoplectic stroke, became hemiplegic on the right side and aphasic, but recovered the power of speech gradually, though she now expressed herself with difficulty. Yet she sang the tune "La dame blanche vous regarde" with the correct melody, pronouncing every word distinctly, and other tunes besides. She was not word-deaf. She could read a few sentences from a newspaper. She could read the title of music-scores, yet not the score itself; she could not read a single note. Of all pieces of music put before her she could read the title, but failed with the notes. Post mortem, a long strip of the convolutions within the Fossa Sylvii was found destroyed.

Case of Frontal Lesion—Aphasia—Musical Sense Preserved.

FINKELNBURG ("Berliner Klinische Wochenschrift," 1870):

A professional violin player, after an apoplectic stroke, lost considerably the memory of names of objects, and more so of abstract ideas. He could still play the violin by ear as ably as before, but not from notes, which he constantly mistook; nor could he write notes any longer without making mistakes. Another stroke deprived him of speech altogether, of the power of writing, and of the ability to read notes. Post mortem, the cortical layer of the island of Reil and the neighbouring parts were found softened.

Case of Frontal Lesion with Loss of Musical Faculty.

FRANK HAY ("Journal of Mental Science," vol. xii.):

Patient, a musician, suffering from epilepsy, became aphasic, and lost the musical faculty as well. He could not be induced to sing, though formerly a member of a church choir. His humming and whistling were only in a monotone, and never in the nature of a tune. The autopsy revealed the tip of the temporo-sphenoidal lobe disorganised, and exposed a cavity which entered the fissure of Sylvius, and laid bare the insula and anterior extremity of the operculum.

Case of Temporal Lesion with Sensory Aphasia and Tone Sense Preserved.

LUDWIG BRUNS ("Allg. Zeitschrift f. Psychiatrie," 1892) showed at the meeting of the German Alienists at Hanover on May 1st, 1891, the brain of a musician with sensory aphasia who had not lost the tone sense. There was softening of the first temporal convolution with the exception of the anterior part.

CONCLUSION

This concludes the evidence in favour of the view of the frontal lobes being the material instruments for the manifestation of the intellectual capacities. In succeeding chapters will be shown the functions of the other lobes of the brain, concerned with the emotions and propensities. Therefore the inference may be drawn that no other part of the brain is involved in the intellectual functions, which we have enumerated. Nothing more is claimed for the view here expressed than that of an hypothesis. That it is one deserving the closest investigation there can be no doubt.

The reader will remember the orthodox view of physiologists, which has been examined minutely in Chapter XX., and will consequently not be surprised to be informed that **CH. CHATELIN** and **T. de MARTEL** (*op. cit.*), in their report on 5,000 wounds of the skull and brain in the recent war, have come to the conclusion that **"there are no symptoms special to wounds of the frontal lobes."** (p. 51). They

declare that the theory, so long maintained, "that the frontal lobes are a very important centre of association and the seat of the highest psychic functions" is "a purely theoretical assumption" and "has never received the slightest experimental confirmation." In other words, because experimenters have failed to dig out any thought or sentiment in vivisected monkeys or dogs, therefore the frontal part of the brain can have no such function. The authors mentioned quote Munk's localisation of "movement of the trunk muscles" and Sherrington's "lateral movement of the eyeballs" as experimental evidence of the functions of this part of the brain, neglecting the fact that the extraordinary size of the frontal lobes in man is a characteristic which distinguishes his brain from that of animals, and the relation of "mind" to brain.

Since localisation of special perceptions, individual memories, and other intellectual functions—as the evidence contained in this chapter tends to prove—is not admitted by present-day scientists, it is not surprising that no inquiries are made regarding the loss of them in lesions of the brain. Owing to this neglect, our knowledge of the *mental* functions of the brain—and the prevention and treatment of mental disorders—is still very primitive, as compared with the knowledge gained in other departments of science; and no progress can be made so long as physicians and surgeons rely too exclusively on knowledge based on the results of experiments on animals.

Dr. RICHARD EAGER, of Lord Derby War Hospital ("Journal of Mental Science" April 1920), states that of the 5,000 cases of head injury passed through his hands only 0·375% became insane. In his opinion most of the cases were purely "functional." Notwithstanding the large material at his disposal, he could quote only 28 cases of frontal injury, and he concludes from these that "there seems to be no uniformity in the psychic symptoms that may follow frontal injuries, and the tendency that there has been in the past to consider as a special characteristic of injuries in this region the likelihood of the moral character of the individual to suffer most is not supported." He found, however, "the number exhibiting states of complete dissociation, such as amnesias, to be comparatively high." Though Dr. Eager mentions my researches, he gives no evidence that he examined the patients psychologically on the lines indicated by me, and, so long as this is not done, reports will continue to be published making it appear that, no matter how serious the injury to the brain may be and whatever the locality that may be affected, no mental change will follow. I repeat the question, What, then, are the mental functions of that organ in the opinion of these observers?

CHAPTER XXX

THE EMOTION OF FEAR AND ITS CEREBRAL ORIGIN

Intellectual functions have from time immemorial been associated with the brain; not so the feelings. Yet whether we assume that they arise through external stimuli, through bodily sensations, or through ideas of our own communicated to us, each rudimentary feeling—if there is anything like order in the nervous system—must have a centre in some group of nerve-cells from which it can set the rest of the brain into activity and produce its bodily manifestation. This has been recognised from time to time by individual observers, who located a general region for feelings in the lower ganglia of the brain; but the idea of cortical centres is still thought absurd. Now, I propose to take in this chapter **the feeling of fear** and to demonstrate its centre of origin in the cortex. I choose fear, first of all, because it is a rudimentary feeling; and, secondly, because it is easily demonstrated by the mass of evidence we possess of its morbid manifestation in circumscribed injury and disease of the brain, giving rise to that state of insanity called **melancholia,** which will be shown in Chapter XXXIV. to have at its base undue anxiety and fear, apparently without cause, or at least with insufficient cause.

It has been shown in the previous chapter that the intellect is related to the front part of the brain, and that over-stimulation of the frontal cells produces a state of mania and exaltation, and that softening of the same part leads to dementia. The conclusion is perfectly natural that **the other lobes of the brain must have functions different from those mentioned;** and since we must exclude the intellect, we must assume that they are related to the primary emotions and propensities. That the functions of the anterior and posterior parts of the brain are different in nature is partly confirmed by the peculiarity of the **blood supply to the brain.**

As regards the blood supply, the brain is divided into two areas: (1) the anterior, fed by the internal carotids, and (2) the posterior, fed by the basilar artery, the union of the two vertebral arteries. The existence of the circle of Willis has done much to give us false impressions as to the amount of inosculation in the intracranial circulation. The existence of necrosis after embolism tells us very clearly of the slight character of the inosculations of the terminal vessels in the substance of the brain; while the occurrence of hemiplegia after ligature of one carotid artery reveals the inadequacy of the circulation through the circle of Willis to maintain the functional activity of the half-hemisphere whose direct blood supply has been interfered with. These two vascular areas contain brain-cells with different properties and functions.

The anterior and posterior parts of the brain appear also to differ in their influence on the nervous system. The former is connected chiefly with the voluntary or cerebro-spinal system, the latter with the sympathetic system. In other words, the *anterior* part of the brain seems to be exercised chiefly in connection with peripheral and muscular sensations and **volition**—with the relation of the organism to its surroundings; the *posterior* seems to receive mostly internal, organic sensations, *i.e.*, to be connected with the **vegetative life.**

The distance between the brain and the viscera, between mind and appetite, is

bridged by the **sympathetic nervous system** (also called "ganglionic"), which plays such a large part in all the great vital processes as well as in the creation and modifications of the emotions. It is only slightly under the control of the will, mostly acting reflexly to prepare the body for spontaneous protective action. That is how the actual origin of the passions has been placed in the viscera. As a matter of fact, the viscera stimulate the brain to emotional acts, by means of the sympathetic nerves; and emotions can stimulate the viscera through these same nerves.

It has been shown in the previous chapter that **the pleasurable passions are connected with the front part of the brain.** In this chapter it will be shown that **the depressing emotions are connected with the posterior part of the brain.**

When, owing to some stimulus, the bloodvessels of the brain are dilated, a state of hyperæmia supervenes, producing a state of exaltation, so long as mild; and, if severe, anger may follow. Just as a little alcohol quickens the circulation and makes us joyous and light of spirits; a little more, and the temper quickens, and argumentativeness and quarrelsomeness may follow.

Ordinary voluntary activity (of the cerebro-spinal system) causes a general expansion of vital action. The blood, under the animating influence, flows more liberally to the surface, and, playing freely through its capillary vessels, the countenance becomes expanded, its expression brightens, and the whole surface acquires the ruddy tint and genial warmth of health. The body also feels buoyant and lively, and there is a consequent disposition to quick and cheerful muscular action: to run, to jump, to dance, to laugh, to sing; in short, every function would seem to be gladdened by the happy moral condition; the common expression, therefore—the heart is light, or leaps with joy—is not altogether figurative.

A stimulus which dilates the visceral vessels, through the sympathetic nerves, causes paleness of the brain by emptying it of blood, and consequent depression, mental and physical languor, and, if severe, gloomy thoughts and fear.

Under the active influence of the depressing emotions the whole body appears, as it were, to shrink or contract. The blood abandons the surface, and being thus thrown in undue quantity upon the internal organs, there follows that inward oppression, that painful sense of stricture and suffocation, and the consequent desire for fresh air which ever mark the intensity of this class of passions. Hence the frequent sighing under severe grief, which act consists in a deep inspiration, succeeded by a corresponding expiration, and so, by expanding freely the chest and affording a larger supply of air, relieves, in some measure, the heart and lungs of their suffocative load. The painful passions also act immediately on all the vital functions, directly depressing all their energies. Although, however, the general effect of the painful emotions is to induce a contraction and a depression of the actions of life, yet, in their exaggerated forms, they are sometimes followed by a transient excitement, reaction, or vital expansion. This has probably some connection with a change in the emotions, as when the animal that took to flight from fear, when driven into a corner, gets into a rage and fights with all its might.

The vaso-motor nerves of these two areas of the brain—the anterior and posterior—are also differently derived.

The vaso-motor nerves of the vertebral arteries spring from the inferior cervical ganglion, into which run the fibres ascending from the abdomen by the greater splanchnic nerve. Indeed, ELIAS CYON (1843-), pupil of Claude Bernard, and ALADOFF, have traced nerve-fibres from the liver up the vertebral arteries. On the other hand, the carotid arteries derive their vaso-motor supply from the middle and superior cervical ganglion. Thus we can see how the emotions sympathise with the organic processes, especially those located in the abdomen, and can comprehend how mental depression may accompany, or wait upon, and depart with abdominal disturbance, which does not extend to the intellectual processes, but involves the emotions alone.

The emotions are the mental interpretation of physiological adaptations for survival, for they are capable of calling up certain powers of the body into action which help to preserve the individual. One may tutor one's face and tongue to assume a condition consonant with one's surroundings, but the gloom or gaiety—the feeling or tendency to feeling—persist, in spite of everything.

Can one fancy the state of rage and picture no ebullition of it in the chest, no flushing of the face, no dilatation of the nostrils, no clinching of the teeth, no impulse to vigorous action, but in their state limp muscles, calm breathing, and a placid face? What kind of an emotion of fear would be left, if there were not present the feelings of quickened heart-beats, shallow breathing, trembling lips, weakened limbs, sensations of goose-flesh or of visceral stirrings?

But the bodily state may be both cause and effect of the emotion. For example, the sight of danger causes us to fear, and an anæmic condition of the brain may also cause a vague fear.

It has been supposed that each emotion has some special organ or organs on which its power is more particularly expended; that some act most obviously on the heart, as fear and joy; others on the respiration, as surprise; and again others, as grief, on the digestive organs. We shall find a clear indication of this connection in our common forms of speech, which must have been derived from observation and generally recognised before they could have been incorporated with our language. The paleness of fear, the breathlessness of surprise, and the bowels of compassion, are phrases sanctioned by the custom of different ages and nations. The effects of a passion, however, are rarely limited to a particular one, but a number of the organic viscera are almost always included within their influence.

The viscera do not distinguish between different kinds of emotion, but the different emotions have their own bed or track deeply laid already and ingrained in the central nervous system, and each has in connection with this track **a separate group of co-ordinating neurones.** This is the view expressed by Prof. SHERRINGTON, the distinguished physiologist, with which I not only agree, but which I shall attempt to prove in this and succeeding chapters.

Those who hold that the origin of the specific emotions cannot be localised in the brain advance as a reason that **each emotion tends to involve nearly the whole brain and bodily organisation;** but, as I have already explained, this is judging by the effects of the emotion.

By observing the effects of circumscribed injury and disease of the posterior parts of the brain—and comparing them with the effects of circumscribed injury or disease of the anterior—it will be seen that the two have different functions. In this chapter I propose to limit the inquiry to the functions of the **central parietal area,** which will be shown to be **affected in states of depression and melancholia,** which have fear, either vaguely or definitely, as their basis. True, fear can stimulate as well as inhibit the entire organism, according to its degree; but so can anger, a totally different emotion. Common sense will tell us that they must have different centres of origin, from which their influence is directed. But it is not by arguments that I intend to prove my statement, but by evidence.

The view that the central parietal area is concerned with the highest intellectual operations, and Flechsig's view that it is the centre for musical ability, have been disposed of in previous chapters. On the other hand, the current theory (of cerebral physiologists and pathologists) that lesion of this area gives rise to **"psychical blindness"** (see Chapter XX.) is not opposed to the localisation about to be proved; on the contrary, a number of examples will be cited of concurrent symptoms of fear and psychical blindness.

We have seen that in lesions of the frontal lobes there is usually a feeling of

physical well-being and mental exaltation. The evidence that follows will show that in lesions of the posterior part of the brain (the area behind the central fissure) —or, more clearly defined, the central parietal area—there is generally a feeling of being physically unwell and mental depression.

At the basis of simple melancholia is the emotion of fear—an unreasonable apprehensive depression, which retards thoughts and movement, and interferes greatly with self-control, without impairing the reasoning power. Whereas joyful emotions accelerate the course of ideas, anxiety, fear, grief, and all depressing emotions inhibit intellectual processes. The intellect remains intact, but as every exertion augments the distress, such patients avoid all occupation, become inert, indecisive, and brood over their own sadness. The intellect is not equal to the task of controlling these gloomy thoughts. **Melancholia is a morbid condition of the emotional life affecting a brain area which is not concerned in intellectual processes.** These only get slower, painful, and restricted to the patient's own woes. (See Chapter XXXIV.) Were melancholia an affection of the entire brain, the intellect would always be involved ; whereas one may meet every day with melancholiacs who do not exhibit any disorder in their ideas or judgment.

Simple melancholia is essentially a state of mental pain, a vague feeling of anxiety, gloom, depression, indifference to the ordinary interests of life, and lack of all hope in the future, or positive fear and trepidation. Those who suffer from it labour under an indefinite despondency, which they can neither shake off nor explain. They find no pleasure in anything, nor can they be touched by the misfortunes of others, their own distress being much more intense than all besides. Thus they live in constant solitude and apprehension. Fear and apprehension shade and modify the reminiscences of the past, exaggerate dangers, and distort reality. Thus a just and rational view of life is no longer taken. The subject is generally acutely conscientious and distresses himself needlessly with worries, of which the unreasonableness is appreciated by him but cannot be got rid of. Other feelings are paralysed, consequently the patient becomes indifferent towards those persons and things which he used to hold in affection. The feeling of fear is so accentuated that any trifling mistake ever made is exaggerated and self-accusations follow, which, however, are not delusions, but simply reasons to account for the depressed feeling and state of anxiety. The patient, as the disease progresses, anticipates dreadful consequences of his past errors ; he is therefore unhappy, sleeps badly, weeps, sobs, sighs, groans, laments his cruel fate, and wishes to be dead. Suicide is common.

The physical manifestations of uncomplicated melancholia are identical with the manifestations of fear. They both produce a state of anæmia through vaso-motor spasm, which causes pallor of the face, cold extremities, and præcordial distress. The contraction of the coats of the arteries causes a rise of blood pressure.

In mania the blood-pressure is lowered ; in melancholia it is increased. Whereas the average blood-pressure in a normal man is 152mm. Hg., and in cheerful people it falls to 145 or 140 mm. Hg., in anxious patients it rises according to the degree of fear to as much as 180 mm. Hg. The tension of the walls of blood-vessels is increased so that they admit only of a small quantity of blood from the heart, which has therefore difficult work to perform, and thus gives rise to painful sensations. A profuse shedding of tears relieves the blood-pressure and relieves also the mental state. This is the reason why grief and anxiety can be worked off sometimes by a good fit of crying.

JOHN TURNER ("Journal of Mental Science," 1909), however, says there is no relation between blood-pressure and mental disorders.

Fear and the anxious emotion, if prolonged as in the state of melancholia, **cause defective nutrition,** and this defect is particularly manifest in those parts of the human frame supplied by the sympathetic nervous system. The skin becomes dry and muddy in appearance, the hair is also dry and harsh, fades in colour, turns grey,

and may fall out altogether; the nails grow slowly; digestion proceeds slowly, leading to discomforts and disturbances which later may give rise to various delusions; the bowels are constipated; the bodily temperature is lowered, the pulse is slowed, and so is practically every bodily process. Owing to the deficient breathing, lung disease is the most common termination of melancholia.

Fear and melancholia render the cerebro-spinal nervous system inactive, hence the muscular languor, lassitude, and loss of all sense of energy. There is frequently a condition resembling what is called "apraxia," namely, an inability to execute the movements required to carry out a definite action, although there is no paralysis. This muscular inability is acknowledged to take place in lesions of the parietal lobe. An erect figure is never seen in this malady. As in an acute state of fear, so in acute melancholia, the subject may remain fixed in one attitude; in another degree he may be restless, but this restlessness is brought about by the involuntary nervous system, and is quite different from the maniacal restlessness which originates in the voluntary or cerebro-spinal nervous system. The trembling of fear is probably due to the rhythmic action of the sympathetic nervous system on the cerebro-spinal nerves. In melancholics, not only is what little movement that takes place done rhythmically, but the words uttered—the expression of their misery—is repeated in a rhythmical manner.

Whereas insanities in which the cerebro-spinal system is involved—such as acute mania and epileptic insanity—can occur suddenly, melancholia involving the sympathetic system is slow in its onset. The beginnings are usually so slight that they attract no notice, and it is not until the disorder has become fully established that it is remembered for how long the symptoms have been gradually increasing.

Pure melancholia being an emotional and not an intellectual disease, it is not surprising to discover that **JULIUS JENSEN** (1841-1891) "Archiv für Psychiatrie," vol. xx., who examined 453 brains of insane patients, found that in melancholia the frontal lobes are not involved, and that **W. J. TIGGES** (1830-), "Allg. Zeitschrift für Psychiatrie," 1888, made the same observation. The latter said: "In melancholia there is no wasting of the frontal lobes—they retain their weight; in mania, there is some loss of weight; in general paralysis the loss is the greatest."

This view was also expressed long ago by the celebrated **J. L. C. SCHRÖDER VAN DER KOLK** (1797-1862), in his text-book on "Mental Disorders" (1852): "In insanity proper, in cases of confusion of ideas, and of insanity of exaltation, I have always found the anterior lobes of the brain suffering; but, on the contrary, in the melancholic, and in those who condemned themselves with or without religious delusions, I have found the upper and posterior parts of the hemispheres diseased, and that in the latter cases the understanding often showed no trace of disturbance, inasmuch as the individuals judged correctly and disputed acutely. In those who at last perished with dementia, I never found the anterior parts of the obes intact; they were alway adherent to the pia mater, and this could not be removed without injuring the grey cortex."

J. A. LOCKHART CLARKE (1817-1880) has said: "That the anterior and posterior lobes have different functions is certain, as the convolutions of the cerebral regions have different structure."

AUG. VOISIN read a paper on "The Suicidal Tendency" to the Academy of Medicine on August 8th, 1882, in which he declared that his observations led him to the conclusion that the particular part of the brain which gave the tendency and impulse to suicide is in the parietal lobes.

CHAS. K. MILLS ("Philadelphia Medical Journal," 1901) held that cerebral tumours in parietal region render patients abnormally emotional.

BERNHARD GUDDEN (1824-1886) declared the anterior half of the brain to be concerned with motion, and the posterior half with sensation.

LUIGI LUCIANI (1842-1919) and **GIUSEPPI SEPPILLI** were of opinion that the fusion of sensory centres takes place in the parietal lobes.

FRANCESCO DURANTE saw in the posterior lobes the centre for general ensibility, and believed them to be involved in melancholia.

ALBERT E. EULENBURG found by experiments on dogs that stimulation of the parietal region produced irritation of the vaso-motor nerves, together with such symptoms as sudden emptying of the bowels, which we frequently observe in fear.

F. L. GOLTZ (1834-1902) and **BEATSON** found that destruction of the posterior lobes in dogs and sheep causes these animals no longer to be frightened by objects that had caused them terror previous to the operation. Dogs which were lively and active before the operation became quiet and apathetic, and their intellect was inhibited.

JAC. MOLESCHOTT (1822-1893) noticed that immediately after destroying in pigeons that portion of the brain corresponding to the parietal lobes in man, they showed a total imperception of danger.

Sir **DAVID FERRIER** observed that: "The animal whose left angular gyrus was destroyed moved only unwillingly, and when it was obliged to; it ran its head full tilt against everything that came in its way. When both angular gyri were destroyed there was still greater reluctance to move from its position, arising evidently from a sense of insecurity, for the animal paid no attention to threats and grimaces.

HERMANN MUNK also observed "non-perception of threatened danger—the animal made no sign of fear at threatening gestures."

HEINRICH KISCH stated as most characteristic symptom of mental depression a sensation of heat about the parietal bone.

R. v. KRAFFT-EBING (1840-1902) considered melancholia a form of neurosis or psychical neuralgia of the sensory centres of the brain. Undoubtedly, melancholia gives rise to a psychical hyperæsthesia.

THOMSEN and **OPPENHEIM** ("Archiv f. Psychiatrie," 1884) stated that the sensory anæsthesia form a typical group of symptoms, the most constant being the bilateral concentric limitation of the visual field. It is important to observe that in almost every case psychical symptoms are present; most often *depression of spirits, feelings of apprehension, and easy excitement to terror.*

GALL described the physical movements appropriate to this area as that of circumspection, taken literally: "Turning the head sometimes to the right, sometimes to the left, holding it slightly inclined backwards, while the eyes, wide open, follow the movements of the head." The locality and description have been unconsciously confirmed by **FERRIER,** who, in stimulation of his Centre 13, observed: "The eyeballs move to the opposite side, and frequently also the head moves in the same direction."

It is also well known that in melancholia there is anæmia of the brain, and in mania hyperæmia; and that hallucinations of sight are common in anæmia, whereas hallucinations of hearing occur in hyperæmia.

There is ample material to prove to us the relation of melancholic states of mind to pathological conditions of the parietal lobes, more particularly of the **angular and supra-marginal convolutions.** Numerous examples will be given, but to remove any doubt which may obscure the judgment in the testing of these cases it is advisable to explain at once those exceptions in which lesions have been found in other regions than the parietal.

Everyone may call to mind cases of melancholia which were found with lesions of the frontal lobes. How are these to be explained? In the previous chapters it has been shown that the frontal lobes are the centres of the intellect, and as such they are the centres of inhibition of the emotions. In a lesion of the frontal lobes, therefore, the control or inhibitory influence exercisable over the emotions would be lost, and thus naturally active dispositions become morbid. Of course, if the patient is demented as well as melancholic, both parietal and frontal convolutions will be found affected.

Sometimes no lesion may be discoverable, and sometimes the whole brain may

apparently be affected. Thus we may find a general anæmia of the brain in melancholic cases owing to inanition. In such inanition-melancholias there prevails an intensification of the natural characteristics of the patient; there is manifested a hereditary or acquired disposition to a depressed condition. The same would be true where the blood is the carrier of toxins.

In all these conditions, only dispositions which are already leading and highly active in the normal state will become morbid. Thus the modest, humble, apprehensive, and conscientious man becomes the melancholiac and self-accuser. Persons who are of selfish and criminal cast of mind do not in their delirious utterances reproach themselves, nor express ideas and sentiments which imply that they are especially troubled about their past conduct. The delusion that they have committed the unpardonable sin afflicts only the meek, humble Christians who cherish ideas of exalted purity, and who long to attain a holiness of life, yet distrust their capacity, wisdom, and self-control; and are thus led to safeguard anxiously their motives, search their hearts for lurking inclinations to sin, and so drift on into the unfathomable abyss of morbid introspection, which naturally ends in insanity. The ungodly, who pursue deliberately lawless, wicked ways, without a pang of regret, do not become self-incriminating the moment thought and reason are unrestrained. It is not the dishonest man, the gambler, or the thief who will, while delirious, confess himself guilty of cheating, embezzlement, and financial frauds; but rather the kind-hearted "Golden Rule" man, who has endeavoured to practise just and upright dealings with all men, and whose generous promptings often have exceeded his means of benevolence.

The clinical material which we are about to produce shows that **the supramarginal and angular gyri are concerned in the production of those morbid psychical and physical states which we collectively term "melancholia,"** of whatever nature the lesion may be. Frequently the functions which have been assigned to this area by various physiologists and neurologists, such as "psychical blindness," exist with melancholia, particularly in its earlier stages. Such earlier stages, however, do not often come under the observation of alienists; and the neurologist, generally speaking, is not wont to notice the mental changes in the patient; or, if he does observe them, he is likely to regard the patient's depression, anxiousness, and morbid fears as the outcome of existing physical trouble and not of the particular lesion of the brain.

I am aware, of course, that by a great many alienists **melancholia is no longer regarded as an independent psychosis;** that it has been shown by **GEORGE DREYFUS** that all of the cases described by KRAEPELIN and his school as "melancholia simplex," "melancholia agitata," and "depressive insanity," are in reality cases of manic-depressive insanity. Dreyfus found in a large number of the cases he examined typical circular symptoms. But this only shows that in manic-depressive insanity we have a general affection of the brain, probably of its circulation; and with cases involving the whole brain, or the greater part of it, we are not concerned in this book. Sir **GEORGE SAVAGE** had already pointed out in 1887 that melancholia might usher in mania or general paralysis, or be present after an attack of mania as a phase of reaction, but that it is also true—as may be seen by the examination of the cases I am about to quote—that melancholia may be a complete psychosis in itself. That, after the disorder has lasted some time, the melancholic state may change into something else is no proof against my view, since the cause may be in a circulatory disturbance which cannot be strictly limited; and, even when it is in the brain itself, it may be of such a character that the mischief cannot remain limited to a particular region for any length of time.

Besides cases of tumours, inflammatory lesions, hæmorrhages, etc., I shall cite cases of injuries to the brain which have been followed by the manifestation of melancholia. These cases of injury to the parietal region, when compared with the cases of injury to other regions of the brain which I quote, will make it evident

that there is no ground for a "traumatic insanity," as various authors have assumed. **A single form of traumatic insanity is simply non-existent.** SKAE, MAUDSLEY, and others have declared that melancholia is rarely present in traumatic insanity, but the cases I shall quote show that injuries to the middle parietal region are always likely to be followed by mental depression, morbid fear, anxiety, and actual melancholia.

In order to demonstrate the practical value of this localisation, I shall begin with cases of melancholia which have been cured by surgical operation.

SURGICAL TREATMENT OF MELANCHOLIA

One of the author's own cases of Parietal Injury followed by Symptoms of Melancholia —Surgical Operation—Recovery. (*Published in* "Lancet," 1907.)

Patient, age thirty-nine, a doctor of medicine, previously quite healthy, fell from his cycle on his head. He did not think that he had received any marked injury, and did not believe there was any connection between his subsequent illness and the accident. There certainly were no external signs, but soon after the accident he began to suffer from hemicrania so severely that he could not go on with his work. He got depressed, anxious without sufficient cause, accused himself of all sorts of evil deeds without foundation, and made some attempts on his life, so that he had to have a companion to watch him. He consulted various specialists, who advised change of scene ; but travelling did him no good. The depression and headache increased. He consulted the author six years after the accident, and was then melancholic, emotional, readily weeping, and very suicidal. The right side of the head pained him much, and there was a burning sensation just behind the right parietal eminence. Operation was proposed, which Mr. William Turner carried out. Only when the head was shaved did a scar become visible, which extended from the situation of the angular convolution just behind the parietal eminence vertically downwards for about two inches. A semi-circular flap was made extending from the ear to the occipital protuberance, and the scar, which was adherent to the bone, was detached. Two trephine openings, one one inch and the other eleven-sixteenths of an inch in diameter, were made and connected with one another. The bone over the angular convolution was thickened and ivory-like, without any evidence of diploë, and the dura was attached to the bone. The brain bulged into the wound and did not pulsate, notwithstanding a strong pulse at the time. On incision of the dura a stream of clear fluid escaped. The dura was found thickened, but the brain appeared quite normal. Dura, periosteum, and flap were each closed with stitches, only a small opening being left for drainage for some days. Patient was at once free from pain and of cheerful, normal disposition, and after two years of perfect health gave permission for the publication of his case.

Other cases of Parietal Injury—Melancholia—Surgical Operation—Recovery.

G. MACKENZIE BACON ("Journal of Mental Science," 1881) :

Samuel S., age thirty-eight, joiner by trade, always in good health. Whilst at work a hammer fell from a height of about six feet on his head. He was not unsensed, nor were any serious symptoms exhibited at the time of the accident ; but six months afterwards he found himself unable to attend to his work through giddiness and inability to fix his mind on anything. A year after the accident he complained of severe pain over the stellate and adherent cicatrix on the left parietal bone. He grew morose and talked of suicide. In the following month he made a most determined attempt at suicide by throwing himself from the staircase at the top of the hospital where he was then an inmate. His life was saved, and he was sent to Fulbourne Lunatic Asylum. An operation was arranged, and Mr. Wherry removed with the trephine from the seat of the injury a piece of the parietal bone, and found the dura mater beneath of a deep purple colour, and apparently healthy ; it bulged with pulsations into the wound. The portion of the skull removed was three quarters of an inch in diameter, but had not been fractured. The wound healed rapidly and well, and a month later the patient was lively and cheerful and

went to work in the carpenter's shop. Three months after the operation he went back to his old employers. He continued in good health.

GEORGE E. WHERRY ("British Medical Journal," 1883):

N., an attendant of the Three Counties Asylum, a strong man, age 25, was sitting in an arm-chair, when a powerful lunatic came up from behind and struck him on the head with a heavy carpenter's mallet. He remained master of his senses, but fainted from loss of blood. There was a compound comminuted fracture of the right parietal bone, from the parietal eminence to the sagittal suture. He was trephined. The inner table was found more extensively fractured than the outer, the fragments of skull being deeply depressed and the brain bruised. The exfoliated bone was removed. Next day the wound unfortunately suppurated. The patient, who, previous to the operation, was merely anxious about himself, otherwise calm and intelligent, got more depressed and sullen, and in another month was insane. He had a vacant and absent look. More pieces of bone which had been exfoliated were removed, after which operation he spoke rationally, and by December recovered sufficiently to engage in farming pursuits.

WILLIAM MACEWEN ("Lancet," 1888):

A man who had received an injury to his head a year previously suffered from deep melancholy and paroxysms of pain in the head. Though the pain was excruciating he welcomed it, as it temporarily dispelled the almost irresistible impulse to kill his wife and children. Prior to receiving this injury he was perfectly free from impulses of this kind and had led a happy life with his family. Immediately after the accident, and for about two weeks subsequently, he had suffered from *psychical blindness*. Physically he could see, but what he saw conveyed no impression to his mind. This gave the key to the operation. The angular gyrus was exposed, and it was found that a portion of the internal table of the skull had been detached from the outer, and had exercised pressure on the posterior portion of the supra-marginal convolution, while a corner of it had penetrated and lay embedded in the anterior portion of the angular gyrus. The bone was removed from the brain and re-implanted in proper position, after which he became relieved in his mental state and made no further allusion to his murderous impulses.

The SAME AUTHOR ("Pyogenic Infective Diseases of the Brain," 1893):

J. W., age twenty-five. Seven weeks prior to admission he fell down the slope of a quarry, his head coming in contact with a projecting stone In this way he received a small wound at the posterior extremity of the left parietal bone, about one inch from the middle line, which gave him little trouble and was soon healed. About three weeks after the accident he began to experience a dull aching pain, and began to suffer from great mental depression. These symptoms continued until his admission into the hospital, four weeks from the attack. At the operation the periosteum was found to be thick and somewhat inflamed. A stellate fracture of the skull was discovered, with a much depressed and comminuted internal table, and about four drachms of pus escaped. At the centre of the affected area the dura mater was covered by a thick layer of granulation tissue, while at its circumference this membrane was flocculent. A fortnight after the operation the wound healed. The patient's former mental depression and painful sensations had entirely disappeared. A month later he was dismissed well, and twelve months after he reported that he was in excellent health and attended to his work regularly.

W. B. FLETCHER ("American Journal of Insanity," 1886-1887):

W. P. H., age thirty-five, fell from a scaffolding six years prior to admission, and exhibited since then strong suicidal tendencies. There was a depression of bone in the left parietal region, near the osculation of the right parietal and occipital. The depression was quite perceptible to both sight and touch. The depressed piece was elevated and, according to Dr. Fletcher, the patient "found to his delight that he was free from pain and from the abnormal mental condition, which had been his constant companion for years, since the moment of his fall from the housetop."

The SAME AUTHOR (*ibidem*):

J. G., age forty-seven, machinist, was struck on the head by a stove-lid lifter three years before admission. He was taken home in an unconscious condition, and so remained for six hours, and confined to his bed for several days. He was soon able to resume work, which he continued to do, after a fashion, for six months.

From this time on he became negligent, careless about his clothing, with lack of interest in anything ; finally melancholy and suicidal. Careful examination under chloroform revealed a scar on the parietal bone one and a half inches from the coronal suture. The scalp was adherent. On dislodging the surrounding bone, a spicule of the internal table was found, puncturing the dura like a carpet-tack. By the seventh day after the operation the patient was a " new man," as he expressed it. He has been able to continue his work as a stove-moulder from that time, and was reported two years after his discharge as being still perfectly well and working at his trade constantly.

The SAME AUTHOR (*ibidem*) :

Henry Stevens, age twenty-three, was admitted to hospital from prison for melancholia. He never talked nor moved, and sat constantly with eyes turned downwards and lids nearly closed, as if to avoid the light. A scar ran from the coronal suture backwards over the left parietal bone, two inches long and one inch wide. The bone was depressed to a corresponding extent, and was removed. The melancholia disappeared. He talked, walked, and cared for himself. But another injury—possibly by contre-coup—was supposed, as patient became later morose and profane.

The SAME AUTHOR (*ibidem*) :

M. C., age forty-four, was injured by a fragment of bursting shell, and suffered from melancholy ever since. There was a deep scar, one and a half inches long, vertically over the centre of the left parietal bone, forming a groove in the bone. Though there was no depression of bone, the patient's pain and nervousness disappeared after the operation, and he became cheerful and went to work as a gardener.

The SAME AUTHOR (*ibidem*) :

J. N., age fifty, fairly educated, and, for a farmer, had accumulated a good fortune. Eight years prior to admission he was standing in a saw-mill, when the boiler exploded, a fragment of iron striking him on the upper and anterior third of the right parietal bone. Through this he was unconscious for several days, but gradually recovered, and for seven years pursued his occupation on the farm. Then he got muscular convulsions of face and arm, and at the same time became melancholic, listless, and sometimes suicidal. His friends wanted him committed to an asylum, but an operation was decided upon instead. There was no fracture at the seat of injury, but the dura was firmly adherent to the bone ; it was tough and did not pulsate. On incision two drachms of fluid escaped, and during the next forty-eight hours a large quantity of yellowish fluid. All symptoms disappeared and patient has been well ever since.

The SAME AUTHOR mentions other successful cases and two unsuccessful ones. These two had suicidal tendencies after injury to the *frontal* bone, and trephining the depressed portion of bone, over seat of injury, did not improve the patients. I have already pointed out that the frontal region is the inhibitory region, so that lesions thereof are liable to accentuate natural tendencies : a naturally gloomy man becoming melancholic, an irritable man bad-tempered and violent, and so on. Hence the importance of the mental symptoms for localisation. There is also the possibility of contre-coup.

P. STETTER (" Centralblatt für Chirurgie," 1892) :

Patient, age twenty-eight, received an injury some eleven years before in consequence of a cart-horse, on which he rode, shying at a railway train and throwing him to the ground. The pole of the cart was driven into the lower part of his right parietal bone, and the depression extended to the parietal eminence. He was carried home unconscious. The wound healed rapidly, but the depression remained. No physical symptoms, but striking psychical changes. Patient shunned all association with men, sat for hours brooding in a corner, had daily paroxysms of weeping, and in the end preferred his bed to getting about. He was trephined and the depressed bone was removed. After the operation patient resumed social life again and became quite normal.

BRIGGS (" Philadelphia Medical News," vol. xiv.) :

A similar case of a patient who was successfully operated upon five years after injury.

J. M. KÖPPE, Halle a/S., ("Deutsches Archiv f. Klinische Medizin," vol. xiii.) :

Christian Liese, when forty-two years of age, received a blow on the left parietal bone. Three years afterwards he betrayed much abnormal anxiety, developed symptoms of melancholia, and the following year he made two attempts at suicide, one by hanging, and one by cutting his throat. He was sent to the asylum. At the seat of the injury a scar was visible, and a small tumour could be felt. On excision it was found to be a neuroma dolorosum. Patient became bright and cheerful, declaring himself free from pain, and was discharged. He reported himself some time afterwards as continuing well.

The SAME AUTHOR (*ibidem*) :

C. D., age eighteen, received a blow from a stick on the left parietal bone, which caused him great pain. Fourteen days afterwards, when the wound was healed, he became excited with fear, saw danger everywhere, looked anxiously about, sat or lay motionless. He was admitted to the asylum with symptoms of melancholia, and had to be forced to take his food. When moved to speak at all he burst out crying. On the left parietal bone there was a highly tender scar, one inch long, adherent to the bone. The excision of the scar cured the patient, and he was discharged.

DANIEL MOLLIÈRE (Report of the French Surgical Congress, 1885) :

M. A., age forty-nine, received an injury in the parietal region close to the temporal bone, which left a scar of fifteen centimetres length. Patient became melancholic, with paroxysms of agitation at night. The operation revealed an abscess in the brain beneath the seat of injury. On letting out the pus, his recovery was rapid. He soon returned to his occupation, which he followed with his former gaiety of spirits, and he reported himself to the physician to have kept well and in possession of all his faculties.

The SAME AUTHOR (*ibidem*) :

H. X., age thirty-one, received an injury to his head which left a scar in the right parietal region. He became melancholic. After trephining the skull at the seat of injury he gradually improved, and was discharged two months after the operation, and reported himself well and working at his trade two years later.

H. A. POWELL ("Surgical Aspect of Traumatic Insanity," 1893) :

Depressed fracture of the right parietal bone in a girl age eight. Depression and apathy. Trephined seven years after injury, when fifteen. Became at once bright and cheerful. Under observation two and a half years.

GEORGE W. CALE ("New York Medical Journal," 1895) :

A carpenter, age twenty-six, always healthy until receiving a blow on the parietal bone to the left of the median line, about midway between the fissure of Rolando and the external occipital protuberance. Four years after, he complained of pain at the spot, and became melancholic, sullen and morose. The depressed bone was elevated. On recovery from the operation he was at once cheerful, and undertook again a responsible position.

BOUBILA and PANTALONI ("Gazette des Hôpitaux," 1892) :

Case of a patient suffering from hallucinations of sight and tendency to suicide, which was cured after lifting up a piece of depressed bone in the posterior parietal region, evidently the result of an injury.

FENOGLIO ("Bologna Rivista Clinica," 1887) :

Similar case. Operation. Complete mental recovery. An interesting observation was made in this case, namely, that *the symptoms were reproducible by pressure over the trephine hole.*

The SAME AUTHOR ("Archiv. di Psichiatria," 1884) :

A young farmer, age nineteen, suffered a depressed fracture of the right parietal bone situated between the parietal eminence and the highest middle point of the temporal crest. The previously merry, cheerful patient fell into a sad and depressed mental condition, which brought him to the asylum five years afterwards, in his twenty-fifth year. He was trephined, and a splinter of bone, which had indented the brain, was removed. After the operation the patient recovered his former bright nature.

PHILIPPE REY ("Report of Alienist Congress," Lyon, 1891) :

Patient, age forty, was admitted to the St. Pierre Asylum for symptoms of melancholia, distressing delusions, and terrifying hallucinations. There was a

depression in the left parietal bone, size five centimetres, about which no history could be obtained. The depressed bone was elevated, the dura mater excised. The meninges presented a gelatinous appearance with milky spots. After the operation the patient lost his depressing delusions and hallucinations.

J. E. CHAMBERS (Report of Cosmopolitan Sanatorium, St. Louis, 1906) :

Patient, age thirty-seven, sustained a fracture of right parietal protuberance two inches long. Part painful on pressure and caused fainting. Three weeks later he had " melancholia agitata " lasting for three and a half years. At the end of that time he was operated upon with such success that he was able to resume his occupation after ten weeks.

T. RIBOLI (" Phil. Seb.," vol. i.) :

Female patient, suffering for four years from melancholia, complained of pains on the right side of the head. There appeared a swelling the size of a nut on the parietal bone. When it was cut open, pus escaped. But it re-formed, and the second time it was cut open by an accidental knock on the head. Then a necrosed particle of bone was discovered underneath. After its removal the melancholia disappeared, and patient having no relapse within a year of the operation, she was discharged.

G. H. HUME ("Lancet," 1908) :

The patient, a man between fifty and sixty years of age, fell from his bicycle and received a cut on the back of the head on the left side. He lay unconscious for a few minutes and came to himself standing in the midst of a group of workmen who had come to his assistance. The wound was dressed by a surgeon late in the day. It healed readily, and the ordinary habits of life and business were not interrupted. But from the date of the accident he felt vaguely ill and suffered from a constant feeling of anxiety and depression. He went on a voyage and wrote : " I must confess to a constant urging towards suicide ; it seems so easy to drop overboard in the dark and end all my troubles." He suffered from pains on the left side of the head. Three months after the accident he was trephined. The posterior parietal region was laid bare by a large flap reflected downwards. The cicatrix of the wound was included in the upper and posterior angle of the flap and the underlying bone showed no trace of injury. Three trephine discs were then removed and the intervening piece of bone was cut out. The exposed dura mater bulged and looked bluish, and when it was incised a quantity of porter-like fluid gushed out to the estimated amount of five or six ounces. Adherent portions of the clot were scraped away, and while this was being done it was noticed that the surface of the depressed parietal lobe was slowly rising to the normal level. The dura mater was readjusted, and the scalp flap closed. The bone was not replaced. He recovered completely.

H. HANDFORD (" British Medical Journal," 1899) :

A girl, age thirteen, had atrophy of both optic nerves. She suffered from headache and melancholia, and had visual hallucinations. There was an osteophite in the right parietal region, which on trephining was seen to have pressed internally. Patient after her operation lost her headache and hallucinations and became cheerful, and even her sight improved.

MELANCHOLIA FROM PARIETAL INJURY

Other Examples of Injuries of Parietal Lobes followed by Abnormal Fear, Anxiety, and Melancholia. Case of Recovery.

CHARLES PHELPS (" Traumatic Injuries to the Brain," 1898) :

Patient, age thirty, fell twenty-five feet from a ship's deck on to a raft alongside. Consciousness was lost for a few moments only. Hæmatoma over right parietal region. After three weeks painful delusions developed. He suffered acute mental anguish, which could have been scarce exceeded had these pure fancies been actual facts. An inclination to weep was manifested both with and without cause. His speech was always coherent. Gradual recovery. Discharged seven months after admission.

Another Case of Recovery.

HAHN ("Allg. Zeitschrift f. Psychiatrie," 1892):

Patient, a little boy age ten, was shown at the Fifty-fifth Meeting of the German Alienists at Breslau. He had received from his teacher a blow with a cane over the left parietal region. Five days after the receipt of the injury patient had a paroxysm of fear accompanied by trembling of all the muscles, painful sensations over the heart, and hallucinations inspiring great fear. He made self-accusations. Two days later came delusions as to his going to be hanged. He regained his perfect mental stability after treatment.

One More Example of Recovery.

M. GAMBERINI ("Bulletine delle scienze mediche di Torino," vol. i.):

A banker, age thirty-four, with a history of syphilis, fell from a height on to the left parietal bone. He had severe headache subsequently, and epileptiform attacks, first slight, then growing in severity, and his mental state became that of melancholia. His expression was that of sadness and anxiety, and he had a fixed stare. The bone was swollen at the seat of injury. Anti-syphilitic treatment not only made the swelling disappear, but cured the melancholia and epileptiform attacks.

RATHMANN ("Vierteljahrschrift f. gerichtl. Medizin," Berlin, 1901):

T. S., age fifty-six, single, Catholic, always healthy, fell downstairs in 1891, and injured the right parietal bone. Since that accident she suffered from insomnia, aversion to food, deemed herself unworthy to receive the Sacraments, believed she was going to be executed, her head chopped off, etc. She spoke only in a whisper. Sighed constantly. She made a recovery and was discharged.

Examples of Parietal Injuries followed by Symptoms of Melancholia.

JOHN GAY (Medico-Chirurgical Society Meeting, November 25th, 1879; "Lancet," 1879):

Patient received an injury to the parietal bone, followed by necrosis. He was for the following five years despondent and suicidally inclined. He was brought into the hospital after an attempt to drown himself. He was to have been trephined, but cut his throat the day before the operation. At the necropsy the inner table was found driven in and adherent to the cicatrix through a fissure in the bone. The brain was normal, only slightly depressed under the indented bone. *During life pressure over the cicatrix always caused hallucinations of the same type.*

JOHN F. GRAY ("American Journal of Insanity," 1876):

A soldier, age forty-one, was wounded in the head, the ball striking the posterior part of the right parietal bone, crushing it in, leaving an opening in the skull one and a half inches in antero-posterior diameter, and three inches in the vertical line. The ball was embedded in the substance of the brain, and was removed with forty-eight pieces of bone ten days after the injury. He remained in good health for five years, when he became depressed and finally developed profound melancholia. Post mortem, an elliptical opening of the right parietal bone was found, corresponding to the wound described; the dura mater extended over the opening and was firmly adherent to the scalp. It appeared inflamed and thickened. Brain apparently healthy.

C. J. ELLEFSEN ("Norsk Magaz. F. Laegevdensk," 1896):

Patient, age fifty-four, became melancholic after some heavy blows on the head. Post mortem, hæmorrhage was found over the parietal region, compressing the convolutions.

M. DINKLER ("Deutsche Zeitschrift f. Nervenheilkunde," Leipsic, 1895):

Katharine Laier, when two and a quarter years old, fell down ten metres over two flights of stairs, and hit the left side of her head on the stone floor. Was rendered unconscious. Since then mentally depressed, hyper-sensitive, suffering from night-terrors and polyuria. Two and a half years after the accident great terror one night, with trembling, agitation, turning of eyes, severe headache and

vomiting. Collapse and death. The left parietal eminence showed a scar 6·5 centimetres long. The brain underneath was hyperæmic.

W. WAGNER ("Volkmann's Klinische Vorträge," 1886, and "Vierteljahrschrift f. Gerichtl. Medizin," 1888) quotes two cases of parietal injuries followed by melancholia.

L. LÖWENFELD ("Archiv f. Psychiatrie," 1898) :

J. L., age thirty, male, single, was hit by a stone on the right parietal bone when thirteen years of age. Since then the injured part was painful and patient became low-spirited and subject to paroxysms of fear.

LUDWIG SCHLAGER ("Zeitschrift der Gesellschaft der Aerzte zu Wien," 1857) :

Two cases, both with falls on the parietal bone, followed by headache, amblyopia, depression of spirits, feeling of anxiety, and tædium vitæ.

PAUL SCHÜLLER ("Psychosen nach Kopfverletzungen," Leipsic, 1882) :

A. Sch., a servant, age twenty-six and a half years, fell on her head into the room below, through a floor which had given way. She injured her parietal bone, was unconscious, and had to keep in bed for five weeks. Low spirits, paroxysms of fear and abnormal sensibility were her symptoms thereafter.

The SAME AUTHOR (*ibidem*) :

H. S., miner, twenty-nine years of age, had both parietal bones injured in a fight, leaving scars, and on one side an indentation five millimetres deep. He became melancholic, wept readily and a good deal, and deemed himself badly used.

DEROUBAIX ("Belgique Médicale," 1906, and "L'Encéphale," 1907).

Man, 32 years of age, received a blow with a hammer on the parietal bone, after which he developed stuporous melancholia and had to be put in an asylum.

HERMANN DEMME("Militär-Chirurgische Studien," Wurzburg, 1864) :

A sergeant-major received a wound in the parietal region. He became a melancholiac of a very bad type.

AZAM ("Archives Générales de Médecine," 1881) :

Patient, age thirty-three, suffered a contusion of the parietal bone, after which he grew emotional, wept without cause, and became very timid.

LUDWIG BRUNS ("Neurologisches Centralblatt," 1889) :

A non-commissioned officer received in a quarrel with a soldier several blows with a sword on the left parietal region. He suffered since then from severe headache, giddiness, insomnia, and attacks of utmost anxiety without cause. These symptoms increased and developed into genuine melancholia. He attempted suicide by hanging, but was cut down in time. He was brought to the asylum.

G. HUGUENIN ("Krankheiten des Nervensystems," Stuttgart, 1880) :

A railway-guard, age forty-two, injured his right parietal bone in a train collision. The symptoms were giddiness, defects of memory and paroxysms of anxiety, in which he wept and cried for hours. He attempted suicide on several occasions. He died eighteen months later.

S. V. CLEVENGER ("Alienist and Neurologist," St. Louis, 1888) :

L., age forty-eight, mechanic, vigorous, cheerful, and industrious, was struck by a flying stone in the left parietal region, and within a year became melancholic. He lost all interest in his former amusements, became helpless and sleepless, and presented the appearance of advanced age.

G. ALDER BLUMER ("American Journal of Insanity," 1892) :

M. D., age 38, was struck on the right parietal bone, where there remained a slight depression. Suicidal tendencies ever since. Operation was decided upon, but curiously not over the scar, but over the motor area. No wonder it did not improve the patient's condition !

ERNEST TREDINNICK ("British Medical Journal," 1900) :

Case of fracture of parietal bone, followed by depression and attempts at suicide.

R. THOMSEN ("Charité Annalen," vol. xiii.) :

Pieper, watchman, forty-three years of age, previously healthy, fell from a cart on his head and received a wound on the left parietal bone, which left an adherent scar twenty centimetres long. He went on his way, but on reaching home he suffered from nervous symptoms which caused him to remain in bed for eight weeks. He then tried to resume work, but had to give it up from a feeling of fear and

anxiety, palpitation of the heart, and giddiness. There was pain at the seat of the scar. His depression increased considerably and he heard voices, with the left ear only, assailing his character, but was unable to distinguish them as unreal and as due to his illness. He saw faces, too, which inspired him with terror. Sent to the asylum a year after the injury, he was noticed to be quietly behaved, to have an expression of sadness, and there was concentric limitation of the field of vision, with tremor of the hand. He was very anxious, especially at night, and his sleep was disturbed by dreams which increased his terror. The excision of the scar was decided upon, but consent to the operation could not be obtained.

The SAME AUTHOR ("Archiv f. Psychiatrie," 1884):

W. Schäfer, age forty-nine, healthy until two years ago, when he was hit on the head with a hammer, rendering him unconscious. On the posterior half of the right parietal bone there was a scar, four centimetres long, with a marked bony depression, sensitive to pressure. The wound healed in about six weeks. Patient suffered since from anxiety, giddiness, terror at the slightest noise. If addressed suddenly he gave a sudden start and was unable to speak a word. He was a strong muscular man. His facial expression betrayed anxiety, and his eyes stared. Continuous melancholic depression. Limitation of visual field.

The SAME AUTHOR (*ibidem*):

K. Poehl, age forty-nine, was hit by a locomotive severely on the head, but did not lose consciousness. Scar seven centimetres long, with depression of bone. Admitted to hospital, patient complained of continuous mental depression and suicidal thoughts. Very nervous and easily terrified. Constant feeling of anxiety, which increased in paroxysms.

Other Examples of Injury to Parietal Region with Melancholia.

J. v. MASCHKA, *Gerichtl.-mediz. Urteile*, Leipzic, 1873.
The SAME, *Prager Medizinische Wochenschrift*, 1879.
LANDERER and LUTZ, *Christophsbad Asylum Report*, 1878.
E. SOMMER, *Zur Casuistik der Gehirnverletzungen*, 1874.
T. S. CLOUSTON, *Journal of Mental Science*, 1872. Two cases.
W. J. MICKLE, *ibidem*, 1883.
STOLPER, *Vierteljahrschrift f. gerichtl. Medizin*, 1897.
E. MENDEL, *Progressive Paralyse*, 1880.
T. C. ENGLISH, *Lancet*, 1904. Two cases.
C. W. BURR, *Journal of Nervous and Mental Disease*, 1898.
MARCHAND, *Nouvelle Iconographie de la Salpètrière*, 1910.

PARIETAL BRAIN TUMOURS AND MELANCHOLIA

Examples of Tumours of Parietal Lobe, especially in Angular and supra-marginal Gyri, with Depression, Morbid Fear, and Melancholy.

Sir WILLIAM BROADBENT ("Lancet," 1874):

Clara C., age thirty-six, a widow, earning her bread as a needlewoman, well nourished, but rather pale and having a sad expression. She was particularly intelligent, but greatly distressed, highly nervous, apprehensive, low-spirited, and often gave way and wept. The emotional depression continued till her death, when two small gummata were found under the parietal eminence, depressing the right supra-marginal lobule.

M. BERNHARDT ("Allg. Zeitschrift f. Psychiatrie," 1883):

The patient was a woman, age sixty-three, who for years had made suicidal attempts. She had delusions of having animals in her body and lead in her head, of having no abdomen. The left side of her body she thought was drying up, because she cut her left wrist in one of her suicidal attempts. Post mortem, the greater part of the left parietal lobe was found depressed for about two centimetres

below its level. The depression was caused by a cyst, filled with serum, beneath the dura and adherent to it.

TH. SARLAN ("Allg. Zeitschrift f. Psychiatrie," 1886):

Patient, age thirty-one, father of five children, complained of a sensation of pressure in the parietal region, of sleeplessness, restlessness, and fear; he easily wept, was afraid of becoming mentally deranged, and had the delusion of suffering from lues, for which he subjected himself on his own account to an inunction cure. His anxiety and fear continued to increase in intensity, and one day he made an attempt at suicide. Patient wept a good deal, searched his whole life for possible causes of his misery, and had to be admitted to the asylum, now suffering for five years, for melancholia agitans. The post-mortem examination revealed a sarcomatous tumour of the parietal lobe.

L. MANOUVRIER ("Bulletins de la Société d'Anthropologie de Paris," 1885):

The brain of a woman was shown, having a depression, size of a walnut, in the parietal lobe, caused by a fibrous tumour implanted in the bone. The patient, age fifty-one, was an inmate of Orleans Asylum, suffering from melancholia and tendency to suicide. Intellectually she was normal.

Sir JAMES CRICHTON BROWNE ("British Medical Journal," 1873):

M. B., age sixty-six, admitted into West Riding Asylum. Family and personal history good. After a transient stroke his mental condition changed completely. He was at first listless, later agitated, and greatly and unceasingly disturbed as to the safety of his soul Moved by his fears on this account, he would wander about the house during the night, wringing his hands, and would talk about his desire to put an end to his earthly misery. On admission to the asylum he was depressed in spirits, and felt, he said, as if he were being perpetually upbraided by his conscience for having neglected to seek salvation. His memory was found vigorous, his face expressed pain; he was restless, sighing and weeping, and, again, he was quiet and stolid, taking little or no interest in what was going on around him. All his muscles were tremulous. His melancholia increased. When spoken to, he would, in attempting to reply, dribble into an incontinent emotional overflow of tears. He gradually became paralysed on the right side. He died two months after admission. Post mortem, a cancerous tumour was found involving the whole of the convolutions of the left parietal lobe.

L. PIERCE CLARK ("Journal of Nervous and Mental Disease," 1895):

J. B., age thirty-four, married, family history good. His illness began seven months prior to admission with intense depression from being out of employment. He attempted suicide with a razor. When questioned he replied in monosyllables. His articulation was slow and hesitating, and at times he broke down entirely, becoming emotional and unable to answer questions. Muscular tremor in tongue, facial muscles and hands. Kneejerks increased equally on both sides. Depression increased. He failed rapidly in health, and died in a seizure eight months after admission. The autopsy revealed four sarcomata, all over the right parietal region, none bulging beyond the cranial surface.

Sir WILLIAM BROADBENT ("Lancet," 1874):

Woman, age thirty-six, suffering from usual signs of brain tumour and manifesting melancholic depression. A tumour was found post mortem in the right supramarginal convolution.

ANDERSON ("British Medical Journal," 1889):

Man, age forty-one, suffering from great mental depression and anxiety. The autopsy revealed a cyst in the gyrus angularis.

C. v. MONAKOW ("Archiv f. Psychiatrie," 1881):

R., a well-to-do farmer's wife, age fifty-three, had no illness until her fortieth year, when she became melancholic, with intense depression and self-accusations. Six years in the asylum. Seven years later relapse with morbid fears and suicidal tendency. Re-admitted. Her anxiety much worse, hardly any sound sleep, wept and wailed for days together, accused herself of impiety, and deemed this the cause of her illness. Intellect unclouded, no hallucinations. She died after five years. The autopsy revealed two sarcomatous tumours in the left parietal lobe which had grown together and had perforated the bone. They involved the gyri supra-marginalis and angularis and surrounding brain substance.

HERMANN OPPENHEIM ("Charité Annalen," vol. x.):

Man, fifty-seven years of age, suffering from intense depression and anxiety. Post mortem, a cyst, size of an egg, in left parietal lobe.

LUDWIG BRUNS ("Jahresberichte f. Neurologie u. Psychiatrie," 1898):

Man, fifty-five years of age, suffering from agitated melancholia, was found post mortem to have a tumour of the left parietal lobe.

GLYNN ("British Medical Journal," 1878):

Man, age thirty, suffering from agitated melancholia, was found post mortem to have a tumour of dura mater over gyrus angularis and supra-marginalis.

PETRINA ("Prager Vierteljahresschrift," 1874):

Man, age sixty-six, suffering from acute melancholia, sighing continuously and walking up and down all night, moaning and wringing his hands in despair. Post mortem, a huge tumour of left parietal lobe.

H. D. DAGONET and P. REY, Asile St. Anne ("Annales Médico-Psychologiques," 1882), found a tumour weighing over 350 grammes over posterior parietal area of both hemispheres in a patient whose condition was that of melancholia and stupor. Patient, age twenty-three, fell on his head when seventeen years old; he died a year after admission.

Other Examples of Tumours with Morbid Fears, Unreasonable Anxiety, and Symptoms of Melancholia, are given by:

T. ZACHER, *Archiv f. Psychiatrie*, 1888.
H. OPPENHEIM, *ibidem*, 1890.
MAROT, *Bulletins de la Soc. Anatom.*, 1875.
E. MENDEL, *Neurologisches Centralblatt*, 1882.
STEIN, *ibidem*, 1897.
G. ANTON, *ibidem*, 1900.
TOUCHE, *ibidem*, 1900.
T. S. CLOUSTON, *Journal of Mental Science*, 1879.
WM. BOYD, *ibidem*, 1873.
R. VIRCHOW, *Onkologie*, vol. II.
P. REY, *Annales Médico-psychologiques*, 1882.
P. NICOL, West Riding Lunatic Asylum Medical Reports, 1872.
GIANELLI, *Policlinico*, 1897. Two cases.

PAUL SCHUSTER, who (*op. cit.*), like the author, has examined the history of cases of parietal tumours, states "that neither progressive paralysis, nor paranoia, nor mania, ever occur in such cases; but that **they are mostly accompanied by states of depression.**" He sees nothing improbable in the localisation of melancholia in this region.

CHAS. K. MILLS ("Philadelphia Medical Journal," 1901) declared that **tumours of the parietal lobes are accompanied by emotional depression.**

W. C. SULLIVAN ("Lancet," 1911), on the other hand, states:

"Actual suicide appears to be a very rare occurrence in cerebral tumour; I have found only one case mentioned in the literature of the disease (a case reported by Rey, quoted by Bernhardt, 'Beitrage zur Symptomalogie und Diagnostik der Gehirngeschwülste,' Berlin, 1881): and in a series of 1,700 post-mortem examinations of suicides reported by Pilcs ('Ann. Méd.-Psych.,' 1908) new growths were found in the brain in only three cases."

In my opinion, the localisation theory cannot be proved by statistics. Suicide is committed for a great variety of reasons, and I am quite sure, if we take all the reports of inquests held in England in a year, we shall find very few evidences of brain disease, not to speak of tumours. We are dealing with mental depressions mounting to melancholia, and all melancholics have a tendency to suicide. If statistics are admitted at all, the only ones of value would be those of asylums for the insane. One might as well disprove my statement that lesions in certain parts of the brain lead to kleptomania, and of others to homicide, by taking the statistics

of all criminals, and showing that only an infinitesimal percentage had any brain trouble whatsoever.

EXAMPLES OF MELANCHOLIC DEPRESSION IN SOFTENING OF THE PARIETAL LOBES

E. KUNDT ("Allg. Zeitschrift f. Psychiatrie," 1894) cites several cases, of which the following is an example :

H. Michael, age thirty-three, married, always of good humour, changed half a year ago after a sleepless night. He made an attempt to hang himself, but was rescued in time. He afterwards gave utterance to delusions of melancholia. He believed himself a thief, a bad and a lost man. He was starving because, as he thought, his stomach would not hold food, it being so constructed that it let everything fall through. He died of phthisis. Post mortem, it was found that the pia over the parietal lobe was thick, milky, and the brain substance beneath was atrophic.

Sir DAVID FERRIER (West Riding Lunatic Asylum Medical Reports, 1874) :

A. B., housewife, age forty-four, suffering from melancholia. Nine weeks before admission the illness began with restlessness and refusal of food. She became very low-spirited, and was influenced by the idea that her soul was lost, because she had been wicked to everybody. She attempted suicide on three occasions, twice by strangulation, and the other time by concealing a razor with intent, etc. The patient had had two strokes, one ten years previously, and the other three years before admission. On admission she was extremely dejected and miserable, her mind dwelling incessantly on her supposed sins and misfortunes. She constantly exclaimed that she had no home, no clothes, and that she would never be able to pay the debts incurred for her food and clothing there. For this reason she refused food. She died six months after admission. The post-mortem examination revealed wasting and softening of the angular gyrus, and both postero-parietal lobules, with the adjacent area.

W. GRANT COOPER (" State Hospitals Bulletin," 1897) :

Widow, age sixty, suffered from acute melancholia. Post mortem was found cystic softening of the left parietal lobe extending to the occipital lobe.

J. LOCKHART CLARKE (" British Medical Journal," 1874) :

G., a woman, age seventy-six, one day suddenly became extremely excited, sitting up in bed and throwing about her arms and wringing her hands in apparent mental distress and despair. On being questioned, she replied that she wished to die because she had been wicked. On every other subject she was perfectly rational. This state of excitement lasted for about two months, and recommenced six months later. Night and day she would wander about the house throwing about her arms and turning up her eyes as if in despair, and crying frequently aloud, " Oh dear, what shall I do ? " She was wholly unable, however, to give any definite or intelligible account of her mental suffering. This state continued for about a month, during which time she frequently refused to take food, declaring that she was unable to swallow ; so that she was reduced to a state of great emaciation. Then she became quiet, but still distressed in mind. After remaining for about a week in this condition, she gradually and quietly sank. Post mortem, the convolutions of the upper part of the parietal lobes were so atrophied that the spaces between them were in some instances three-quarters of an inch in breadth. It was over this space that the membranes were adherent to each other, as well as to the falx and skull.

Other cases of Softening of Parietal Lobes with Melancholia.

VOISIN and BURLUREAUX, *De la Mélancolie*, Paris, 1880. Numerous cases.

J. LUYS, *L'Encéphale*, 1881. Two cases.

JAMES SHAW, *Brain*, 1882 ; and another, *ibidem*, 1895.

F. LALLEMAND, *Rech. anat.-path. s. l'Encéphale*, vol. II.

A. ROSENTHAL, *Centralblatt f. Nervenheilkunde*, 1889.

PATRICK NICOL, West Riding Lunatic Asylum Medical Reports, 1872.
PERCY SMITH, *Journal of Mental Science*, 1890.

EXAMPLES OF HÆMATOMA OF THE DURA MATER (PACHYMENINGITIS INTERNA) IN THE PARIETAL AREA IN FEAR, FRIGHT, and MELANCHOLIA

H. AUBANEL ("Annales Médico-Psychologiques," vol. ii.) mentions several cases of sudden shock followed by raptus sanguinis, where post-mortem hæmorrhage in the parietal area and false membrane were found.

J. B. BOUILLAUD and J. L. B. CRUVEILHIER made similar observations.

L. F. CALMEIL ("Traité des Maladies Inflammatoires du Cerveau") gives numerous cases.

AUGUSTE VOISIN and CHARLES BURLUREAUX ("De la Mélancolie," Paris, 1880) also cite numerous examples of localised hæmorrhage in the parietal area, but we will quote only one case as a specimen :

Gr., a woman, age thirty-four, hitherto without any serious illness, during the days of the siege of Paris and the Commune became impressed with fear. For two months she could express only one phrase, indicative of her anxiety. She lost all interest in her work and domestic affairs. One evening, when she heard shooting, she grew excited, tore her clothes, and attempted suicide by jumping out of the window. After her rescue she refused all nourishment, and, being unmanageable, her husband placed her in the hospital. On admission she seemed terribly emaciated. Her face bore the aspect of terror. Her excitement abated and she lapsed into a state bordering on catalepsy, had to be fed with the tube, and uttered only a few words of terror. Post mortem was found a small subarachnoid blood cyst over the left parietal lobe, and the arachnoid in this region was studded with numerous yellow spots, size of pins' heads, which, on microscopical examination, turned out to be dilated capillaries, filled with hæmatosine granulations, hæmatine crystals, mostly discoloured, and blood globules.

RUDOLPH ARNDT ("Archiv f. Patholog. Anatomie," 1871) :

H. B., age twenty-five, watchmaker, mentally always very bright and lively, was noticed by his parent about six years before admission to change in mood and become melancholy. Mentally and physically he became very inactive ; nothing interested him any more. He sat still the greater part of the day, rarely uttering a word, betrayed an anxious uneasiness, and was ultimately removed to the asylum. On admission his face was found pallid and expressionless and his emotional state apathetic. He died of phthisis five years later. In this case a pseudo-membrane was found extending over both parietal lobes, and on the left side the convolutions were flattened by fluid accumulated under the false membrane.

C. FRÖHLICH ("Allg. Zeitschrift f. Psychiatrie," 1875) :

C. U., age forty-six, wife of a manufacturer, suffered from melancholia. Her fear and anxiety were intense. She refused all food, considered herself a great sinner, wished herself dead, and made an attempt at suicide. On admission she was found to have delusions of having to die a frightful death, fears of being put in a boiler with seething oil, and of being swallowed by serpents. Pretending to get a breath of fresh air at the window, she, in an unobserved moment, committed suicide by hanging. The autopsy revealed hæmorrhage under both parietal tuberosities.

W. J. MICKLE ("Journal of Mental Science," 1880) :

A soldier, age thirty-five, was depressed and apathetic, sat by himself, never spoke unless addressed, sighed, and took no apparent interest in his surroundings. He was suicidal. The expression was one of sadness and misery. The obstinacy of the patient as to the taking of medicine and food was a source of much difficulty. The post-mortem examination revealed a false membrane (the organised remains of hæmorrhage), size of a five-shilling piece, symmetrically placed in both parietal lobes just opposite the parietal eminence, which was eroded.

BRIE ("Neurologisches Centralblatt," 1897) :

Catherina D., single, age thirty-six. Five years before her admission she showed the first signs of melancholy. As cause was given rejected love. Her condition gradually got worse, she took no interest in anything, remained silent,

preferably in bed, and when disturbed she was unfriendly. Post mortem was found in each angular gyrus, right and left, a hæmorrhagic focus, with softening of the neighbouring parts.

H. D. MACPHAIL ("Journal of Mental Science," 1915) :

D. S. B., age twenty-five, well nourished and of good physique, suffering from a first attack of acute melancholia. Previous to admission had made two definite attempts at suicide. His mental state was one of intense depression with delusions of unworthiness and marked suicidal tendencies. Post mortem : Pachymeningitis Interna Hæmorrhagica.

Other Examples of False Membrane and Pachymeningitis Interna Hæmorrhagica with Symptoms of Melancholia.

PLINY EARLE, *American Journal of Insanity*, vol. ii.
S. G. WEBBER, *Boston Medical and Surgical Journal*, 1883.
D. J. CUNNINGHAM, *Journal of Anatomy and Physiology*, 1879.
F. A. AMELUNG, *Bericht Uber das Hofheimer Spital*, 1830.
F. C. HOYT, *Medical Record*, New York, 1892.
JOFFÉ, *Vierteljahrschrift f. Psychiatrie*, 1867.
SEIDLITZ, *Zeitschrift f. d. Gerichtl. Medizin*, 1809.
J. WIGGLESWORTH, *Journal of Mental Science*, 1888.
P. REY, *Annales Médico-Psychologiques* vol., viii.
L. MEYER, *Archiv f. Psychiatrie*, 1872.
S. POZZI, *L'Encéphale*, 1883.
GAIRDNER, ROBERTSON, and COATS, *British Medical Journal*, 1875.

In support of this clinical observation may be quoted the experiment of **KREMIANSKY,** of St. Petersburg, who produced artificially a pachymeningitis hæmorrhagica circumscripta in the parietal region of dogs, and observed their mental changes. **The animals exhibited morbid fear, and refused to take any food.**

CASES OF MELANCHOLIA WITH WORD AND PSYCHICAL BLINDNESS

The next cases are such as have shown symptoms not only of different degrees of melancholia, but in addition the symptoms attributed to the angular and supramarginal gyri by Munk and other observers, namely, *word-blindness and psychical blindness, i.e.*, being able to see words and objects, but failing to recognise them. This defect is apparently due to a disruption of the connecting link with the perceptive centres; and not only of the perceptive centres, but of all the stored-up memories; in consequence of which such patients lose all interest in life. The melancholy need not persist; there may be only a sudden, strong depressing emotion at the outset, followed by "word" or "psychical" blindness.

J. M. CHARCOT ("Progrès Médicale," 1883) described the first case :

X., a Viennese merchant, who spoke German, Spanish, and French, and was well acquainted with Latin and Greek, who had a splendid visual memory for words, inherited from his father, a professor of Oriental languages, also a visual memory which enabled him to recall all persons and objects once seen, and a splendid memory for figures; he could furthermore draw, well remembering every detail of landscape. On the other hand, his auditory memory was defective, and he had no ear for music. About a year and a half before consulting Dr. Charcot, patient had *great anxieties* about some debts, which he thought he might not be able to pay. He lost his appetite and could not sleep. When, after all, his financial worry proved groundless, his worry and anxiety did not cease, but went on for a whole year, during which he continued *apprehensive without any reason,* until one day he perceived a great change in himself, which made him think he was going mad. He was already very nervous and irritable. Although he could see everything as before, he had lost the optic memory for forms and colours. This only increased his anxiety.

Whenever his business called him to a town which he had been in the habit of visiting, he now felt as though he were in a new town, not recognising the streets, buildings, or monuments. Only after staying some time could he recollect them anew. He could not figure to himself objects mentally. He could not draw from memory any longer. He could not remember the form and features of his wife and children. In addition he had a certain degree of word-blindness. The examination of his eyes revealed no change. He trained his memory afterwards by his auditory impressions, repeating words aloud.

COTARD ("Archives de Neurologie," Paris, 1884) :

M. P., age sixty-eight, diabetic, came first to the asylum in 1872, when suffering from *melancholia*. He was in a continuous state of fear and apprehension, and refused food. He believed himself ruined, incapable, and wished to end his life. Sometimes he sat quite motionless. At other times he would walk up and down the room repeating that he was the most unfortunate man in the universe, that he was lost, and that he would never recover. It was extremely difficult to get him to dress himself or to perform the most necessary acts of life. Yet a year later he had so far improved that he was permitted to join his family at home. He returned in 1881, with the like symptoms of anxious melancholia, with similar delusions, only more intensified. He thought himself totally incapable, devoid of energy or intelligence, and possessed of all possible miseries. His hypochondriacal ideas increased. He now asserted that he had no blood, that his whole body was rotten, that he was going to die, that he was already dead. For several months he had complained that he could not represent mentally the objects with which he was formerly quite familiar. Thus, he could not remember a single picture of the town in which he had been living for a long time, and every shop and house which he knew formerly and could picture to himself with closed eyes. Even the face of his wife he could not call to mind, and sometimes it seemed to have quite vanished from recollection.

The AUTHOR himself has seen two extraordinary cases of mental depression with loss of memory :

Both received blows on the parietal region, but without leaving scars. The one in a railway accident, the other, a naval officer, in a submarine explosion. Both had recently married, and exhibited, besides mental depression, loss of visual memory. Both after recovery from unconsciousness failed to recognise their wives, and persisted in denying they were married to them. As one of them put it when consulting me, "This lady claims to be my wife. . . . I know nothing about her." The second case led to a separation, as a child was born five months after the accident, the parentage of which the officer denied, notwithstanding the assurances of the entire family.

Case of Parietal Tumour—Melancholia—Psychical Blindness.

C. S. FREUND ("Archiv f. Psychiatrie," 1889) :

Patient, age fifty-seven, suffering from word-blindness and psychical blindness. The mental state is described as follows : "However the moods of the patient may vary, one expression predominates over all others and is perceptible, whether the features are at rest or in motion. It is the expression of anxiety. The patient looks helpless and in fear. He was very emotional, crying easily without sufficient cause. Even to his own physicians he speaks but little, and that guardedly. Only when completely assured of the friendly feeling which the visitor entertains towards him does his reserve give way, and then talks as freely as his defect will allow him." Post mortem, a sarcoma involving the medullary portion of both parietal lobes was found.

Case of Parietal Atrophy—Melancholia—Psychical Blindness.

The SAME AUTHOR (*ibidem*) :

C. K., age sixty-eight, gave constant sighs, groans, and lamentations, without any reason, certainly not from pain. His face and whole demeanour expressed helplessness and perplexity. His surroundings seemed strange to him. He

seemed psychically blind, and he did not know where he was. He did not understand that he was being medically examined, but looked on the physicians as his enemies, against whom he must defend himself. He was in fear to leave his bed, and when he did get out he moved about with the utmost caution. No paresis, however. He sat brooding, a picture of absence of all will-power. After three weeks his weeping, sighing, and moaning still continued.

Case of Tactile Amnesia—Psychical Blindness and Melancholia.

CHARLES W. BURR ("Journal of Nervous and Mental Disease," 1897):
Patient suffered from inability to recognise objects by the sense of touch, and had mind-blindness, *i.e.*, inability to recognise objects by the sense of sight. She remained in bed, dull, apathetic, talked little, and showed no interest in anything.

Other Examples of Melancholia with Psychical Blindness.

G. ANTON, *Wiener Klinische Wochenschrift*, 1889. Symmetrical lesion.
A. CHAUFFARD, *Revue de Médecine*, 1881.
KUCZINSKI, *Neurologisches Centralblatt*, 1910.

CASES OF SYMMETRICAL ATROPHY OF THE PARIETAL BONES IN MELANCHOLIC STATES OF MIND

Numerous observers—Larrey, Broca, Virchow, Rokitanski, Maier, Chiari, Féré, George M. Humphry, and others—have been in possession of skulls with symmetrical depressions on both parietal bones. There is also one in the College of Surgeons' Museum in Lincoln's Inn Fields. The observers have described the "naked eye" and "minute" anatomy of these deformities, but were unable to discover the cause. These parietal depressions commonly exist on the two sides, and are symmetrical in position and more or less alike in size. They are situated at some distance on each side of the sagittal suture, if not on the parietal tuberosity itself. The thinning is sometimes so considerable as to produce a hole or perforation in the centre. These depressions do not present any indication of being the result of disease, such as syphilis, as ROKITANSKY has assumed. They are certainly not the result of external influences or accident. Changes in the circulation alone would not cause in the part such a circumscribed symmetrical wasting. These depressions are not congenital, as HUMPHRI thought, nor is MAIER correct in attributing the circumscribed thinning of the skull to senile atrophy. The author finds that in those authenticated cases in which a clinical history was obtainable, such history was invariably one of psychical pain and melancholia, and that it is therefore probable that these localised changes in the skull may be due to trophic influences.

R. VIRCHOW ("Verhandlungen der Phys. Med. Gesellschaft zu Würzburg," 1854) showed the skull of a man whose chief symptoms besides pain and giddiness were *intense melancholy*, and whose facial expression had been observed to be always one of extreme sadness. On both parietal bones, exactly corresponding to the eminences, the bones were so thin as to be perfectly transparent when held against the light. Virchow described the morbid histology of this affection minutely.

RUDOLF BLOCH ("Prager Medizinische Wochenschrift," 1897):
Patient, age eighty-six, had a round depression of four and a half centimetres diameter on each parietal bone. Patient was in a condition of *mental depression* and bore the indicia of anxiety. She was tremulous, slow of speech, and hesitating in her answers, and wrung her hands despairingly. Her intellect was quite normal. History of suicide in her family. Two weeks before admission she had made two attempts to kill herself, trying to knock her skull in with a hammer, showing still an open wound, and a day later she used a knife, but was stopped just in time. Later on it was ascertained that she had been in the same institution some thirty

years before, and on looking up the case-book it was discovered that she was then treated for symptoms of fear and depression and for boring pains in her head, and that then shortly before her admission she had made four attempts at suicide—two by drowning, one with a pocket-knife, and one with a razor. Post mortem, the examination of her skull showed that in the thinned cranial parts the lamina externa and diploë were completely absent. The lamina vitrea appeared unchanged, and at the borders of the depression the diploë was heaped up and there was hyperostosis of the lamina externa.

The SAME AUTHOR (*ibidem*) gives a second example.

LUDWIG MEYER ("Archiv f. Psychiatrie," 1872):

C. Th., age forty-four, single, became melancholic in his forty-first year, it is said through disappointment in love. Hypochondriacal delusions of changes in his own body, effected by women. Repeated paroxysms of fear, with a tendency to self-mutilation—one attempt, cutting his veins in neck and at wrist, nearly caused his death. On admission he wailed and moaned over his supposed misery. Had attacks of acute fear. The autopsy revealed atrophy of both parietal eminences.

ROSSBACH ("Deutsches Archiv f. Klinische Medizin," 1890):

Patient, age forty-nine, had suffered from melancholia for twenty-five years, had symmetrical atrophy of both parietal bones. The skull and two others, of identical cases, were shown at the German Psychiatric Congress in 1889.

Other Cases of Symmetrical Atrophy of both Parietal Bones with Symptoms of Melancholia.

H. SCHÜLE, *Sektionsergebnisse bei Geisteskranken*, 1874.
W. B. PRITCHARD, *Journal of Nervous and Mental Disease*, 1890.
H. VOPPEL, *Allg. Zeitschrift f. Psychiatrie*, vol. xiv.
W. FRÄNKEL, *ibidem*, 1877.
KIRCHHOFF, *ibidem*, 1883.

CASES OF ABNORMAL EXPANSION OF PARIETAL BONES IN MELANCHOLIA

The author has seen several such cases, but they are rarely mentioned in medical literature.

J. E. D. ESQUIROL ("Mental Diseases") mentioned some.

F. A. H. VOPPEL ("Allg. Zeitschrift f. Psychiatrie," vol. xiv.) recorded four such cases.

M. RIVET ("Bulletins de la Société Anatomique de Paris," 1887) mentioned the case of a melancholic with suicidal tendency whose parietal bones were of extraordinary expansion and thickness, and whose brain was flattened in this region.

A. CAMPBELL CLARK ("Journal of Mental Science," 1879):

John R., age thirty-eight, showed post mortem a uniform increase of the natural convexity of the left parietal bone, and the left parietal eminence jutted out abruptly about one inch below the sagittal suture, and therefrom downwards showed a well-marked convexity. The pia mater adherent to the marginal convolutions on *both* sides. Clark says: "The emotion of fear, as already observed, was very strongly marked. This emotion, believed to be the lowest of its class, was, when excited in him, quite beyond the control of his will, and no amount of experience could rid him of it, or lessen its intensity. Thunder was a great terror to him, and its first peal was the signal for covering himself over with the bedclothes. When placed in an armchair, though protected all around, he was in a state of deplorable misery, until he was brought back to bed, so great was his fear of falling." Altogether, "the most exaggerated faculty in him was the emotion of fear."

CONCLUSION

Sufficient evidence has been given, I hope, to prove that the supra-marginal and angular gyri are in some way connected with the emotion of fear and the mental

disorder known as melancholia. Lesions of the frontal lobes may cause similar symptoms, but only when the emotion of fear and the complex characteristics which underlie melancholia have been previously active, and through the frontal lesion complete control over these mental powers is lost. I admit no other exception. Certainly, simple melancholia does not occur in lesions of the temporal lobe; but only when complicated with delusions of suspicion. (See Chapter XXXII.)

According to **CHATELIN** and **de MARTEL** (*op. cit.*), there are in a certain number of cases **no symptoms in lesions of the parietal lobes,** and in the remainder only disorders of sensibility, and aphasia and apraxia. Although I published the greater part of my evidence in my works on "The Mental Functions of the Brain" (1901) and "Mental Symptoms of Brain Disease" (1910), and originally in the "Journal of Mental Science" (1900), and have been quoted in several text-books, as by BIANCHI and by SCHUSTER, the authors appear not to be acquainted with it, or think it insufficient to deserve notice. But, if Chatelin and de Martel have observed *no symptoms* in lesions of the parietal lobes, then the results of experimental physiology are also discredited, and we are back again where we were fifty years ago, and the laborious and extensive experiments on animals have been in vain.

Dr. RICHARD EAGER ("Journal of Mental Science," April 1920) in his Report (see prev. chap., p. 121) claims to have had only three cases of parietal injury. The *first* case mentioned is that of a man who had been wounded by a shell splinter "just above the right ear," and therefore not in the parietal, but in the temporal region; and the mental change exhibited corresponded to those described in lesions of that area (see next chapter). "Formerly a steady quiet man, he was now noted as showing a marked insubordination . . . laughing in his officers' faces," having "lost all sense of discipline." "Formerly a staunch teetotaller, he now took to drink." The *second* case was that of a boy, age nineteen, wounded by a bullet over the upper part of the parietal region, which, in my opinion, corresponds to the posterior end of the frontal lobes, and so did the symptoms exhibited. He had a record of good conduct all his life, and now became "a notorious liar and full of deceit in every way." The *third* case was that of a man below average intelligence, and should not have been included. One case was returned as "psychasthenia," but seems to have been really one of "morbid fears." This patient suffered from "syphilophobia," which developed some months after a bullet wound in the posterior part of the left parietal region.

CHAPTER XXXI

THE EMOTION OF ANGER AND ITS CEREBRAL ORIGIN

Irascibility is a primitive emotion and has for its object the overcoming of obstacles and foes for our own preservation. **Anger increases the bodily energy, enabling us to remove things that threaten us,** and is thus a reflex mechanism of immense value in the struggle for existence. It is an innate mechanism manifested long before the living creature has had any experience. The disposition to it varies in degree in different individuals. In its healthy state it gives executive power; in its unhealthy state it is manifested in chronic bad temper and quarrelsomeness. Its extreme can be observed in "irascible insanity" (acute mania), in which there are ungovernable spontaneous motor impulses and violent anger, generally without loss of knowledge of the surroundings. The person may be so furious as to exhaust himself in shouts, threats, and actions; or the passion may be less vehement, but in all cases it is "anger." When it is fully established, it is an ungovernable intense excitement, a wild paroxysm with a blind desire of destruction, and must not be confounded with the harmless restlessness of the anxious melancholiac.

It will be seen from several hundred examples cited in the following pages that when the **temporal lobe,** more particularly at its base, is stimulated, **states of excitement** (irascibility) are produced. When FERRIER excited this region in cats and jackals, "the application of the electrodes in this region caused the animal to make a sudden spring or bound forward, pricking up both ears, as if preparing to *fight,* and opening of the mouth, associated with vocalisation and other signs of emotional expression, such as spitting and lashing the tail as if in rage."

Excitation of this area in man produces irascibility, from the simple form of anger to furious and even homicidal mania. When the tendency to irascibility is innate, there need be no temporal lesion, but injury or disease of the frontal lobes may, owing to the loss of control, give it exaggerated activity. But I have not come across a single case of irascibility with disease limited to the parietal lobe, except that form of melancholia called "agitated" melancholia, just as **I have found not a single case of melancholia in which the disease was limited to the temporal lobes.** With the agitation caused by delusions of persecution I shall deal later. The evidence for the temporal lobe being in some way the centre of a reflex mechanism for the protection of self by states of excitement which give additional energy to the entire body is overwhelming.

The temporal lobes are separated only by a very thin partition of bone from the internal ear and can therefore be irritated by *extension of ear disease,* leading to various degrees of excitement and mania, which disappear with the treatment of the ear trouble. Affections of hearing differ in this respect from affections of sight, which, when due to central lesion, lead to mental depression, paroxysms of fear, and melancholia, with attempts at self-destruction. I shall also show that while discharge from the ear continues the patient may be quiet, but on cessation of the escape of pus a violent attack of mania may ensue. These facts are not all proved yet, but observations in confirmation of some of the statements have been made by

a number of authors—Griesinger, Jacobi, Körner, Huguenin, Morel, Paul Robin, Bennett, and MacEwen, besides those whose cases will be quoted.

Further, I pointed out nearly twenty years ago, in the "Mental Functions of the Brain," that **lesions of the temporal lobe may lead to epilepsy** as well as violent mania. No other part is so vulnerable in this respect as the temporal lobe. Recently several observers have admitted that "tumour" situated in this region may give rise to convulsive fits, and THEODORE MEYNERT (1833-1892) long ago found that in epilepsy the greatest atrophy and loss of weight is in the temporal lobes; but that is all that has been acknowledged so far. For a time it has been thought that excitation of the motor area gave rise to epilepsy, but it does so only in what is called Jacksonian epilepsy, not in ordinary epilepsy. ALDER BLUMER trepanned over the motor regions in ten epileptics, but neither the number nor the severity of the fits improved; whereas I shall quote several cases in which the fits disappeared on treating the lesion of the temporal lobes; and not only the fits, but the mania as well.

Sometimes the temporal lobes are sound, but distension of the lateral ventricles causes pressure on them. Sometimes also mania and epilepsy are caused by fractures of the base of the skull through extravasation of blood into the brain tissue and tearing of the structure of this region.

Sometimes an epileptic fit may be replaced by a paroxysm of acute mania, which fact shows the intimate relation between the two, the convulsive and the maniacal attack. Both are paroxysmal and explosive, violent and sudden. The change of disposition in the epileptic is remarkably characteristic. From this change alone an experienced observer will frequently be led to infer the presence of epilepsy. There are present extreme irritability, a combative tendency, undue suspicion, violent outbreaks of temper, and frequently strong homicidal tendencies. Post-epileptic violence is impulsive; it precludes the existence of animosity or premeditation; there is generally an entire absence of motive or cause of quarrel. That this mental state is due to the disease and not to any predisposition to violence is shown by the fact that so many epileptics, in the intervals between their fits, find genuine consolation in religious devotion, that they are ever hopeful, and fully appreciative when sympathy is shown them in their suffering.

J. A. ORMEROD ("Brain," 1884) gives one hundred cases of epilepsy, among which forty-six suffered from ear disease.

It is a well-known fact that there are some insane patients whose mental disturbance dates from the time of an *apoplectic stroke*. Considering the proximity of the temporo-sphenoidal lobe to the corpus striatum, in which most of the hæmorrhages take place, it is not surprising that such patients, even when not insane, become excited, irascible, and quarrelsome. They are rarely seen in asylums, for they hardly ever become so excited as to be dangerous, and, secondly, because the accompanying hemiplegia prevents them from becoming violent. Neurologists, on the other hand, study more the derangements of the motor and sensory functions, and would take but little, if any, notice of the mental changes.

J. LUYS ("L'Encéphale," 1881) found that in hemiplegics, whose temper is easily irritated, the temporal lobe was involved.

ALBERT ROSENTHAL has described cases of patients with hemiplegia who manifested agitation and bad temper, and in whom the temporal convolutions showed lesions post mortem. ("Centralblatt f. Nervenheilkunde," 1884 and 1889.)

If further proof were needed of the fact that congestion of the temporal lobes leads to irascibility, violent and destructive tendencies, we have it in the frequency of *hæmatomata auris*, which seem to be due to a sanguinous perichondrial effusion of the auricle, and appear to withdraw the blood from the adjacent brain substance;

hence, on the appearance of the hæmatoma, it is not uncommon that the mania ceases.

If this theory be correct, one would expect also in chronic mania an increase in the size of the temporal lobes, and I shall publish some cases in confirmation thereof.

Neurologists and alienists should also be interested in the fact that in the congestion of the temporal lobes caused by various lesions, **patients otherwise aphasic can still utter "oaths"** when they can articulate nothing else. Sir **W. T. GAIRDNER** (1824-1907) and **HUGHLINGS JACKSON** (1834-1911) called attention to this peculiar affection, and I shall also cite some such cases.

Another observation of interest and confirmatory of this localisation is that **word-deafness and acute mania can and do sometimes occur together,** while word-blindness is never found associated with it, but always with melancholia.

In the "Gazette Médicale de Bordeaux," July 16th, 1911, is an article entitled "La Jargonaphasie Logorrhéique," in which volubility without word-deafness in lesions of Wernicke's area is described. When the lesion bordered on the parietal the patients were sad, otherwise all the cases were gay and *irascible.*

Altogether there will be placed in this chapter at the disposal of the physician and physiologist an overwhelming mass of clinical material and pathological observations which cannot be passed over lightly.

RECOVERY AFTER SURGICAL OPERATION

HERBERT A. POWELL ("The Surgical Aspect of Traumatic Insanity," 1893) quotes the following case from the "Pacific Medical and Surgical Journal," 1884:

A Swede, age thirty-five, in the Arizona Penitentiary for manslaughter, was found by the medical officer in a state of wild mania. On examining him, he found a depression covered by a cicatrix above and rather behind the ear. No history of the cause of this depression was forthcoming from the man. He grew much worse, and, as a last resource, was trephined, and depressed bone, two and one-eighth inches by seven-eighths of an inch in area, was removed. Shortly after his recovery from the anæsthetic, he said in English, "I am hungry—I want something to eat." It was not before known that he could speak English. He talked quite rationally with his attendants and seemed cheerful. Twelve days after the operation he gave his own history.

DANIEL MOLLIÈRE ("Lyon Médicale," 1881):

Patient, age forty-one, was admitted on account of maniacal furor. His roaring terrified his companions. On examining the head, a slight wound was found in the left temporal region, just above the external auditory meatus. On probing it, a fracture of bone beneath was detected. Patient was trepanned, and pus was found beneath the dura mater. Two days later he recognised his friends, made sensible inquiries, and after a month left the hospital a normal man. He reported himself three months later perfectly well.

E. HOFFMANN ("Deutsche Medizinische Wochenschrift," 1881):

A man, age fifty, was struck by a heavy board falling from a great height on to his head. He lost consciousness and became delirious. Afterwards he had attacks of furious mania, in which he caused tremendous destruction in his household, so that he had to be removed to the asylum. He complained of pain in the head. He had no convulsions or any motor or sensory symptoms. On the right side of the head, a little above and behind the external opening of the ear, was found a small but tender depression of bone, about the size of a shilling, which was resected, when on incision of the dura four spoonfuls of cerebro-spinal fluid streamed out. The pia was turbid and œdematous, and more fluid escaped therefrom. The wound healed well. No further attacks of destructive mania—in fact, no psychical symptoms of any kind. Discharged cured, and reported himself six months afterwards as perfectly well.

E. v. BERGMANN ("Volkmann's Hefte," No. 190):

A. H., age thirty-nine, fell from a scaffolding about six yards high. The only

marks of injury were on the right side of the head just above the ear. Patient was so excitable and restless that he had to be restrained. He recovered after surgical treatment.

JAMES HOWDEN ("Journal of Mental Science," 1875) :

J. S., age fifty-one, received an injury to his head, and became insane. He was restless, raging, and dangerous to others, and so remained until the forming of a large abscess in the left temporal fossa, which was opened, when he became sane again.

ERNST SOMMER ("Zur Casuistik der Gehirnverletzungen," 1874) :

A coachman, age twenty-five, fell from a ladder and fractured his right temporal bone ; hæmorrhage from right ear. The temporal arch was much swollen. Patient became acutely maniacal and had to be isolated. An abscess formed over the left ear. After surgical intervention and removal of necrosed piece of bone he recovered.

J. A. E. ESTLANDER ("Finiska Läk Handlingar," 1897) :

Boy, age thirteen, with violent mania after injury to temporal bone. Operation. Recovery.

P. GUDER ("Die Geistesstörungen nach Kopfverletzungen," 1886) :

Case 7, periodical attacks of violent mania. Two long scars across temporal bone. Operation. Recovery.

SERGER ("Allg. Zeitschrift f. Psychiatrie," 1911) :

Mania after fracture of temporal bone. Operation. Recovery.

SAVORY ("British Medical Journal," 1869) :

J. B., age twenty-two, a brakesman on the underground railway, was found lying across the line by the guard of another train. When admitted he was quite unconscious. There was a slight wound behind the left ear. There was grinding of the teeth. The right temple was swollen. He became so violent that he had to be strapped down. He was noisy and used obscene language. He recovered after surgical treatment and was discharged six weeks after the accident. He had no recollection of it.

A Boy with Uncontrollable Propensities Improved by Craniectomy.

A. SPANBOCK ("Neurologisches Centralblatt," 1895) :

Lipe Spielmann, a boy of fourteen, had been physically and mentally slow in development. He teethed only at the end of the second year, learned to walk only when three, and began to speak when four years old. He was sent to school in his ninth year, but made absolutely no progress ; took three days to learn one letter and then forgot it. All efforts to teach him anything were fruitless ; he did not learn to read, write, or to count. Morally, also, he remained undeveloped. He thrashed his fellow-pupils when he could. The older he grew the more dangerous he became to the family. He had to be constantly watched to keep him from destroying things, or beating or throwing stones at someone. His deeds brought him frequently before the police courts, to the great annoyance of his family. The boy getting worse, a medical consultation was sought. The boy was well built. On admission it was observed that his frame, with the exception of the skull, was regular. The latter showed signs of degeneration ; low forehead, big ears, abnormally high palate, teeth widely apart. He also had "tic convulsif" of the right M. orbicularis palpebrarum. The patient could not remain still in any one place, he shouted abusive words at everybody, did not reply to questions, or repeated in a senseless manner the questions put, or, if he did reply, it was with foul words. He could not fix his mind for one second, there was a constant flight of thoughts. He told falsehoods and had a tendency to steal. He had no sense of decency or feeling for others. Craniectomy was proposed and carried out. An incision was made in the sagittal line, another vertically down to each ear. The latter incision revealed the site of a former injury. The tissues above the right ear were adherent to the temporal bone. After several trepannings had been made the bone was cut away, when on the right side the cortex was found œdematous, and looked as if covered with gelatine. There was no improvement, mentally or morally, immediately after the operation ; on the contrary, the strait-jacket had once to be

used. Yet in the course of a year there was a gradual change. He now behaved properly, did not disturb anybody, showed no inclination for destruction, but on the contrary tried to make himself useful to his family. He spoke politely, and showed gratitude. "He was even able to blush." Intellectually, improvement could only take place with education.

Homicidal Tendencies Apparently Relieved by Surgical Operation.

G. BURCKHARDT ("Zeitschrift f. Psychiatrie," 1891):

B. R., widow, age thirty-seven, had hallucinations of hearing with impulses to kill her sister and child. A portion of the brain weighing three grammes was removed from the posterior part of the first and the middle of the second temporo-sphenoidal convolutions on the left side. The substance of the brain was found unusually soft. Sensory aphasia after the operation, but fewer hallucinations. Her quarrelsome tendencies and impulses to kill seemed to have disappeared, and she was delighted to be with her child again. She was discharged. She was unexpectedly found drowned one day, and it was possible she committed suicide, though she was then quite free from mental disturbance.

Operative Cure of Homicidal Mania and Epilepsy of Twenty-five years' Duration.

BOUBILA and PANTALONI, of Marseilles ("Gazette des Hôpitaux," 1892):

Woman, thirty-one years of age, received at the public insane asylum at Bouches-du-Rhône for imbecility with uncontrollable impulses of violence. The only noticeable incident in her history was that she had a fall at the age of six, which still left a scar with depression in the bone in the left temporal region. Before that accident she was a normal child. After it she became queer, insubordinate, irritable, and quarrelsome, and could not be kept in any school. At the asylum she was the terror of her companions, and even attacked the physicians. Epileptic fits developed. She was trephined, and a portion of bone which pressed on the brain removed. A month after the operation it was noticed that she had changed in her conduct; there was no more disgraceful language, insolent behaviour, acts of violence, but modesty, deference, and grateful emotions. She was anxious to work. Her fits ceased. She was released a year after the operation.

Cases of Homicidal Mania, with Recovery after being Trephined.

LAMPHEAR ("University Medical Magazine," 1893).

COHUIRSCO and MILHAERCO ("Spitalerd," Aug. 1907):

Patient struck in right temporal region by a horse's hoof developed acute mania. Recovery after trepanation.

Case of Violent Delirium, with Recovery after Surgical Operation.

ERNEST LAPLACE ("Medical and Surgical Reporter," 1896):

Mrs. D., age fifty-four, was struck by her husband with his fist on the left side of her head. She became insane with violent mania a short time afterwards. She was taken to the asylum, where she was in a violent delirium, "causing so much disturbance as to be handcuffed and isolated." She was trephined in the left temporal region, where the bone was found very much thickened and the dura congested. "Three weeks after the operation she returned to her home absolutely well, and is so still, at this moment, six months after the operation."

Example of Epilepsy and Homicidal Mania of Seven Years' Duration cured by Operation.

W. B. FLETCHER ("American Journal of Insanity," 1887):

C. E., age thirty-seven, was struck on the head when thirteen years old with a small wagon wheel; had epilepsy when twenty years old, and married at twenty-two. In a fit of frenzy he killed his two-year-old child by catching hold of its feet

and beating its brains out. Admitted to the hospital at the age of thirty, he continued violent and homicidal. Trephined. The convulsive fits and mania ceased. Six months after discharge still well.

Examples of Bullet Wounds, causing Mania; Operation; Recovery.

AZAM ("Archives Générales de Médecine," 1881):

X., age thirty-eight, was shot in 1870, the ball penetrating his skull at the upper end of the fissure of Rolando, and coming out about nine centimetres above the external auditory meatus. A peaceful, agreeable man previous to the injury, he had changed to a bad-tempered fellow who became violent without provocation. He was trepanned and the ball extracted. After the operation the patient regained his former character.

H. F. W. WENDT ("Allg. Zeitschrift f. Psychiatrie," 1875):

A soldier, age twenty-five, received a shot along the whole of the temporal region at the battle of Hallue. A year and a half later he had hallucinations of hearing and became violently maniacal, the attack setting in with a piercing pain in the left temple, and lasting five to eight days. Patient when well was a quiet and modest man. In his attacks he was noisy, quarrelsome, abusive, and violent. Two pieces of lead were extracted. Six months later he reported himself well and free from attacks.

Sir THOMAS SMITH ("Lancet," 1879):

Similar case of bullet wound in temporal lobe, with recovery.

MANIA SUBSEQUENT TO EAR DISEASE SUCCESSFULLY TREATED

Case of my own:

Young girl, age fifteen, had regular fits of maniacal excitement, in which she destroyed whatever she could lay her hands on, threw the furniture about, tore her younger sister's hair out, and tried to stab her eyes when unobserved. When free from attacks she was a modest, quiet girl. She suffered from middle ear trouble, for which she was surgically treated. On evacuation of the pus, she became perfectly well.

LUDWIG MEYER ("Deutsche Klinik," vol. vii.):

T., age forty-five, changed in character about two years previous to his admission. Always of cheerful temper, amiable towards his family, peace-loving and sociable, he grew irascible, kept in ill-humour for days together, and was often violent and dangerous to those about him, and the strait-jacket had to be applied to him frequently. A few days after admission a putrid discharge from the ear was noticed, and simultaneously his mania ceased. Two months later the discharge stopped, and then his fury recommenced, so that he had to be isolated. In three days' time the discharge reappeared, and the mental excitement diminished and ultimately gave way. This repeated itself so often that the attendants began to regard the otorrhœa as a barometer of the mental state of the patient. One day, however, the discharge ceased without any signs of mental excitement, but it was observed that the pus had made its way to the mastoid cells, where a tumour could now be seen. On incision and subsequent proper treatment, patient was cured of his ear trouble and with it of his mental derangement.

J. KÖPPE ("Archiv f. Ohrenheilkunde," 1875):

Hoffmann, bricklayer, sustained in his forty-ninth year several injuries to his left ear. Gradually he became irascible, quarrelsome, and dangerous to his wife and children, with whom he had lived on happy terms previously. On treatment of the ear disease he recovered his sanity.

B. BALL ("L'Encéphale," 1881):

Patient, age twenty-two, received a blow on left ear when thirteen years of age, which was followed by perforation of the tympanic membrane with putrid discharge, also noises in the ear. He sought treatment on account of his uncontrollable paroxysms of anger. Later he also heard voices of an insulting character. The otitis media was treated, and with it the mental symptoms gradually disappeared.

Ear Disease in Child leading to Violence and Destructive Tendency. Treatment; Recovery.

E. BOUCHUT ("Gazette des Hôpitaux," 1877):

A child, six years old, alarmed its parents considerably by its frequent attacks of delirium, presenting all the characters of madness. Not recognising its parents, it would endeavour to strike and beat them; it would break up all the furniture in the place and run its head against the walls, thinking them living beings, all the time shouting noisily. The attack would last several hours, and occurred at night as well as during the day. The attack being over, the child would grow calm, recognised those around him, and be none the worse but for a slight headache. There was no sign of epilepsy or meningitis, or any other nervous symptom other than those mentioned. On questioning the parents, it was ascertained that the child had had a discharge from the right ear. On examination, the parts around the ear, particularly along the sensory nerves, were very tender. After treatment the attacks ceased and did not again recur.

Another Similar Case.

W. S. BRYANT ("Journal of Nervous and Mental Disease," 1906):

A girl, age five, had chronic ear trouble of a purulent nature. Whenever there was retention of pus the child had maniacal attacks, during which she broke everything within reach and fought desperately with all the members of the family, including those she was most fond of at other times. Drainage of the pus cured the patient.

Case of Irascible Mania with Improvement after Treatment.

R. v. KRAFFT-EBING ("Uber die durch Gehirnerschütterung u. Kopfverletzung hervorger. psych. Krankheiten," 1868):

J. S., age twenty-five, innkeeper, no hereditary predisposition, previously healthy and of peaceful character, married to an evil-tempered woman, who one day threw a porcelain jug at him which struck him on the left temple. Two deep wounds in front and above the ear were the result, one having cut the temporal artery across. The wounds healed normally, but already after three weeks there was pain radiating from the scars and evoking great irascibility. The patient became violent, attacked those who approached him, complained of sleeplessness, buzzing in the left ear, from which pus oozed. His violence and destructiveness increased, necessitating his admission. There was œdema around the scar, and at the posterior part one could feel a distinct depression of the bone with projecting edges. The part on pressure proved very painful. Tormenting tinnitus aurium. On the ear trouble being attended to, the excitability of the patient diminished, and he was able to be discharged four months after admission. On later inquiry it was found that he still suffered from pain over the area of the depressed bone, was still easily roused to anger and rage, but they passed quickly away.

Other Examples of Maniacal Excitement cured by Treatment of Ear Disease.

H. SCHÜLE, *Handbuch der Geisteskrankheiten*, 1878. Three cases.
W. RHYS WILLIAMS, *Lancet*, 1877.
G. C. BABLETT, *American Journal of Insanity*, 1877. Two cases.
J. O. GREEN, *Boston Medical and Surgical Journal*, 1905.
SIR WATSON CHEYNE, *British Medical Journal*, 1890.
FRANCIS SKAE, *Edinburgh Medical Journal*, vol. xi.

VIOLENT MANIA AFTER INJURY TO INFERIOR TEMPORAL CONVOLUTIONS

A Medico-Legal Case.

R. v. KRAFFT-EBING ("Uber die durch Gehirnerschütterung und Kopfverletzung hervorgerufenen psychischen Krankheiten," 1868):

J. L., healthy up to his twenty-first year, a quiet, peaceful man; family history

good ; was attacked one day and struck on the left side of the head above the ear, causing hæmorrhage from the ear. He was unconscious for nine days and subsequently deaf in left ear. From that time he became avaricious, greedy for money, irascible to an ever-increasing degree, so that he could bear no contradiction and at once took to personal violence. Four years after the accident he married, but he ill-treated his wife and children for no or but very trifling cause, and beat them until they bled and were half-dead. Punishment had no effect on him. One day a neighbour teased him and challenged him to shoot if he dared. L. did so and killed him. He immediately gave himself up with the pistol still in his hand. His state of mind was inquired into. He was transferred to an asylum. His irascibility and violence continued there, also his covetousness. He threatened to shoot all the doctors. He suffered from headache, giddiness, and tinnitus aurium, but there were neither motor disturbances nor hallucinations.

The SAME AUTHOR (*ibidem*) :

G. G., age fifty-eight, a farmer, untainted and hitherto healthy, was run over at the age of twenty-three by a cart in such wise that the wheels passed over his head, producing a dent in the bone over the left ear three inches long, one inch broad, and half an inch deep. Patient was unconscious for a long time, recovering, however, completely, there remaining only some deafness in the left ear with an occasional paroxysm of rage. These affections did not, however, interfere with his vocation for twenty-three years. Two years prior to admission, subsequent to some financial losses, his excitability increased, and he had an attack of acute mania, lasting several weeks, which was repeated again and again after lucid intervals of eight weeks. In these intervals he was mentally torpid, and had to keep a good deal in bed suffering from headache. After admission to the asylum the paroxysms of acute mania continued with shorter intervals, varying from three weeks to ten days, and lasting, as a rule, from six to ten days. Besides the mania, he showed a morbid impulse for hoarding. The ebullitions of rage, his great destructive propensity, and his active kleptomania necessitated his isolation. He died of bronchitis after ten years' residence. The autopsy revealed a deep scar on the left temporal bone half an inch deep, pieces of bone having pressed on the brain substance and caused softening there.

The SAME AUTHOR (*ibidem*) :

A. W., age twenty-eight, fell when twenty years old from a height on to his head, from which injury a still visible scar and fissure on the left temporal bone resulted. He showed mental confusion at first, then broke out into violent mania.

GUSTAV SPIES ("Zur Casuistik der traumatischen Manie," Würzburg, 1869) :

Margarete L., age thirty-six, married, mother of three children, was most irascible, though an affectionate mother and industrious housewife. After knocking her head one night in the darkness against a stone, her husband was alarmed at her irascibility, which seemed to increase every day after the slight accident. She became furious, raging, aggressive and voracious. A slight contradiction would result in personal violence. In the intervals she was good-humoured and loquacious. A week after the accident she became so violent that she had to be brought to the asylum. Her destructive, aggressive, and noisy mania soon necessitated the application of the strait-jacket. Her muscular power during these attacks was astounding. In another week she had sitophobia, and great difficulty was experienced in feeding her by reason of her violent resistance. The lucid intervals grew briefer with each attack. After one of these outbreaks of fury she collapsed and died. The post-mortem examination revealed hæmorrhage in both middle fossæ, more so in the right, and adhesion of the dura mater to the base of the skull.

REGINALD HARRISON ("British Medical Journal," 1869) :

A dock labourer, age forty-three, had fallen head foremost down a ship's hold, a distance of about thirty feet. On admission he was insensible, cold, and almost pulseless. In the course of the afternoon he partially recovered sensibility, but on being aroused he became exceedingly riotous. On the day following his admission he was in a semi-conscious state. On speaking to him he endeavoured to answer but became exceedingly noisy and riotous. On the third day he became so excited and violent that at times he required two attendants to restrain him. There was

no fever. On the fifth day he gradually became completely insensible, and died on the tenth day. Post mortem it was seen that the temporal lobes at the base were of a dark olive colour, gradually fading into the normal appearance as traced upwards ; they were also much softer than natural, in some parts almost diffluent. Rest of the brain free.

A Medico-Legal Case, with post mortem-evidence.

SERGER ("Allg. Zeitschrift f. Psychiatrie," 1911) :

Patient, a man in the fifties, always shy and of a retiring disposition, abstainer, slipped on the ice in the street, blood oozing from nose and ears. Subsequently he suffered from headache and insomnia. The accident was discussed in a Court of Law, his own doctor declaring him incapable of ever resuming work, the insurance experts arguing to prove only temporary disablement. Patient sought further independent advice and, his case being thought serious, he went for a few weeks to Dr. Serger's asylum for observation. It was found that he suffered from constant restlessness, excessive irritability, and an unwarrantable dislike of his family. The Court declared the case to be one of hysteria ; but as *he made a murderous attack on his family,* the police sent him back to the asylum, where he showed a still greater increase of irascibility than on his first stay. Nearly two years after the accident patient hanged himself with a kitchen-cloth in the lavatory. The post-mortem examination revealed a double fracture in the temporal fossa in the middle line, the membranes being adherent to the bone.

Another Medico-Legal Case.

Reported in the "Daily Telegraph," London, January 24th, 1902 :

This was an action brought by a Lambeth tailor, on behalf of his seven-year-old son, to recover damages from Messrs. J. T. & S., Ltd., for injuries sustained by the boy through the negligence of the defendants' servant. It appeared that a truss of hay fell from the defendants' van on the boy's head and knocked him to the ground. He was picked up and carried home, where he was found to be suffering somewhat severe injury. A lad who worked in the shop after school hours described the child as a lively little boy before the accident ; now he was dull and miserable ; formerly he was well-behaved, now he hit his mother frequently. The father supported this statement, adding that the boy would now take anything and break it, and once he deliberately set fire to a pair of trousers to see them burn. Formerly quiet, well-behaved, he now rushed out into the street, frightening passers-by, picking up stones and throwing them at their heads. He was also given to swearing. The medical superintendent of the Tower Hamlets Dispensary, who attended the boy, expressed his opinion that there had been slight fracture of the base of the skull. During the first week or two there were signs of paralysis, but these symptoms passed away. There was no defence, and the jury assessed the damage at £50.

Other Cases of Fracture of Base of Skull with Serious Symptoms.

ERNEST TREDINNICK ("British Medical Journal," 1900) :

Patient, who sustained fracture of base of skull, killed his wife and then shot himself.

The SAME AUTHOR (*ibidem*) :

Patient received a kick from a horse, fracturing skull at left mastoid process. He became maniacal.

CHARLES L. DANA ("Journal of Nervous and Mental Disease," 1889) :

Kate C., age thirty-two, domestic. Always healthy. No epileptic history. Two years prior to admission patient fell down an air-shaft, distance of thirty-five feet, striking her head. She was unconscious for several days ; was in bed for several weeks. Her friends say she grew different in disposition afterwards, and became "queer" in her mind. At times she was very destructive. Eighteen months later supervened chill, three days fever, temporary rigidity of left arm, continuous headache with vomiting. Four months later vertigo, forced movements, sudden falling, always backwards and to the right. When the headache

was less severe and she grew more conscious she proved very restless and would throw herself out of bed continually, always on the right side of the bed. At last she was tied in. At the autopsy, on removal of the brain, a good deal of blood was seen in the right middle fossa. On the under surface of the right temporal lobe was a focal lesion consisting of softened brain tissue mixed with blood. The lesion involved the third and fourth temporal convolutions in their middle three-fourths.

Examples of Injuries to Temporal Lobes leading to Violent Mania and Epilepsy.

FRANCIS SKAE ("Edinburgh Medical Journal," 1866):

J. E., age fifteen, son of a farmer. His father's statement was as follows: He was a very intelligent boy until he was five years of age, and at that time he was struck immediately behind the ear by his schoolmaster with a ruler. The blow caused swelling and ecchymosis—no fracture. The same night he screamed out in his sleep; in the morning a change in his manner and appearance was noticed; he seemed stupid and silent; he ceased to speak entirely for six weeks. When he began to speak again he talked nonsense. It is now ten years since he received the blow; he is often very noisy at night, and he *swears* a great deal. His father managed him at home until he brought him to the asylum on account of his violence and his dirty habits. He never had any fits or any symptoms of paralysis. On admission he seemed perfectly imbecile, and his bodily condition was weak. He was very noisy at night, swearing profusely, and he was very dirty in his habits. He was put among the noisy patients, and continued unchanged for a year and three months. Then followed a succession of very severe epileptic fits for three days, in one of which he died. The post-mortem examination revealed four drachms of serum in the lateral ventricles, so that it could have been pressure only that caused the symptoms.

LAWSON and MAJOR ("Lancet," 1876):

B. W., when six years old, was knocked down and run over by a carriage wheel, injuring the whole of the right temple and leaving a depression. Some portion of the bone had necrosed and came away. From that time he had fits. Previous to the accident he was a bright and intelligent boy; he now became more and more demented. He was given to paroxysms of noisy excitement, in which he fought fiercely and attacked his companions. On his admission he continued aggressive and quarrelsome. He had an offensive discharge from the left ear, and gradually a small abscess formed behind the ear. Two years after admission he had severe hæmorrhages from mouth, nose, and left ear, up to a quart of pure blood at a time. He continued querulous and stupid. He died after a frightful outburst of bleeding. Post mortem, there was an old clot in the right temporal lobe, and both grey and white substance were degenerated. There were depressions and rough projections on the petrous portions of both temporal bones and brown staining of both bone and dura mater. The hæmorrhage was caused by friction of the larger vessels against the corroded osseous prominences.

Case of Slate-pencil in the Head causing Violent Irascibility and Epilepsy.

MAX HUPPERT ("Archiv der Heilkunde," Leipsig, 1875):

Carl T., age forty-two, well educated, industrious, and always of a cheerful temperament, received an injury to his head about a year before admission and was thereafter irascible, ill-treating his wife, and in the institution his fury continued. Hæmatoma auris appeared spontaneously in both ears. A year after he had epileptic fits. He died of œdema of the lungs. On post-mortem examination there was found stretching from the inner wall of the squamous portion of the right temporal bone, along the middle fossa to the cornu ammonis, a slate-pencil seventy-three by five millimetres, i.e., three inches long and one-fifth of an inch broad. How the pencil got there could not be ascertained. The appearance was much as if the pencil had been in this situation all the patient's life, and had caused no symptoms until the accident, a year before the patient's death.

Case of Temporal Injury with Irascibility and Aphasia, yet Swearing Fluently.

(See remarks on p. 148):

R. BRUGGIA ("Archiv. Ital. par la Malat. Nervos," 1884) :

A fireman, age thirty-five, was hit in an explosion by the point of a wooden rod so violently in the left temporal region, about two to three millimetres above the external opening of the ear, that the bone was indented to the extent of admitting the point of a finger. Fourteen days' stupor followed this accident, after which he was unable to speak, though he understood everything that was said to him, and easily got into a temper, in which he could use abusive words quite fluently, which he could not articulate when quiet again. He could reproduce melodies without a mistake.

Another Similar Case.

M. JOWETT ("Western Journal of Medicine," 1868) :

Patient received injury to temporal lobe, became aphasic, but could swear when in rage.

Example of Temporal Injury followed by Character Changes, apparently only temporary.

CHARLES GIBBS ("International Clinics," 1902) :

G., a young officer, received an extensive wound at the base of the skull and in the neck, which had been sown up. In spite of the severity of the wound, he fought on. He reached the Langman Hospital forty-eight hours after. Blood was oozing from the wound. The stitches were removed and the whole extent of the wound was explored. There was considerable injury to the structures of the neck, the main mass of the mastoid process and the adjacent petrous bone had been blown away. The upper part of the wound was full of brain matter reduced to a sanguinary pulp. At least one ounce was removed at the first dressing. This was the wound of exit ; the wound of entrance was about four inches above this and a little behind it. It was an ordinary Mauser puncture of three-eighths of an inch in diameter. There was complete facial paralysis on this side and complete deafness. The general condition of the patient was extremely good ; he was perfectly conscious, understood what was said to him, answered properly, and took his food well. *The only mental change was in his temper.* This could hardly have been worse. He grumbled at everything and everybody. This irascibility was quite abnormal, for he was well known as a man of great amiability and very popular with his regiment. Since his recovery of health the irascibility has completely gone, and he is once more of charming amiability. The wound was surgically attended to and in a few weeks healed up. The author concludes : "This case is interesting as showing what a grave amount of destruction the brain is able to sustain without losing any of its functions." But both the examination and the history given are incomplete. On inquiry, it appears the man has not done so well.

Three other cases are given by the author where nothing mentally has been observed.

Other Examples :

CHARLES PHELPS, 42 cases. *New York Medical Journal*, 1893.

O. HERPIN, several cases. *Bulletins de la Société Anat.* and *Progrès Médical*, 1876.

JAMES ROSS, several cases. *Diseases of the Nervous System*, 1883.

R. v. KRAFFT-EBING, several cases. *Friedreich's Blätter*, 1868.

PAUL SCHULLER, several cases. *Psychosen nach Kopfverl.* 1882.

BERNHARD BECK, several cases. *Die Schädelverletzungen*, 1865.

LANDERER and LUTZ, several cases. *Christophsbad Asylum Reports*, 1878.

L. SCHLAGER, several cases. *Zeitschr. d. Ges. d. Aerzte z. Wien*, vols. vii. and viii.

HARTMANN, several cases. *Archiv f. Psychiatrie*, 1884.

LIEBER and BEDSTUBNER, *ibidem*, vol. xv.

HERMANN DEMME, several cases of bullet wounds. *Militär-Chirurg. Studien*, Würzburg, 1864.

BAX, bullet wound. *Fricke's Zeitschrift*, vol. viii.

R. W. AMIDON, bullet wound. *Journal of Nervous and Mental Disease*, 1880.
J. CHRISTIAN, bullet wound. *Archives de Neurologie*, 1889.
Sir W. S. SAVORY, *British Medical Journal*, 1869.
SHAW and CRIPPS, *ibidem*, 1890.
W. H. BATTLE, *ibidem*, 1890.
J. LANE, *ibidem*, 1872.
J. RUSSEL, *ibidem*, 1865.
FLEMMING, homicidal case. *Sachsenberg Heilanstalt Bericht* and *Allg. Zeitschrift f. Psychiatrie*, vol. ix.
W. J. MICKLE, two homicidal cases. *Journal of Mental Science*, 1881 and 1885.
J. R. WHITWELL, *ibidem*, 1891.
W. B. FOX, *ibidem*, 1891.
C. A. T. BILLROTH, *Chirurgische Klinik*, 1871.
H. VOPPEL, *Allg. Zeitschr. f. Psychiatrie*, 1857.
A. PICK, *Prager Mediz. Wochenschrift*, 1880.
J. WAGNER, *Jahrbuch f. Psychiatrie*, 1889.
VAN DEVENTER, *Psychiatr. Bladen*, 1887.
ZIERL, *Friedreich's Blätter f. gerichtl. Med.*, 1882.
THOS. CLAYE SHAW, *Archives of Medicine*, 1882.
F. LALLEMAND, *Récherches Anat.-Path. sur l'Encéphale.*
L. F. ARNAUD, *L'Encéphale*, 1888.
G. J. GUTHRIE, *Injuries to the Head affecting the Brain.*
ALCOCK, *Lancet*, 1877.
G. THOMSON, *Brain*, 1884.
DANIEL CLARKE, *American Journal of Insanity*, 1881.
SCHAFER, *Centralblatt f. Nervenheilkunde*, 1881.
JULIEN TELLIER, *Traumatismes du Crâne*, 1890.

VIOLENT MANIA FOLLOWING TUMOURS OF TEMPORAL LOBES

KAPLAN ("Allg. Zeitschrift f. Psychiatrie," 1897) :

A nursemaid, age thirty-two, suffered for about four years from great irritability and sudden attacks of anger, after which she sometimes became aphasic. She suffered from loss of consciousness and attacks of giddiness for twelve months. During the two years she was at the asylum she proved very excitable without cause, exaggerated little matters, and was continuously quarrelling with the other patients. She had outbursts of fury and made obscene remarks. During the last weeks of her life she suffered from headache, giddiness, and vomiting. The necropsy revealed a tumour occupying nearly the whole base of the left temporal lobe.

E. KLEBS (" Prage Vierteljahrschrift," 1877) :

A man, age thirty-three, whose mental symptoms were violent anger with paroxysms of fury, had a neuroglioma in left temporal cortex.

LINDSTRÖM (" Hygiea," vol. xviii.) :

Male, age fifty-five, had fracture of temporal bone when twenty years old, which healed completely. Paroxysms of fury every three or four weeks. Headache in right temporal area. Vomiting. Post mortem, a tumour was found in right temporal lobe adherent to dura mater.

H. SCHÜLE (" Sectionsergebnisse bei Geisteskranken," Leipsic, 1874) :

Jacob Hock, age fifty-six, admitted for furious mania with impulses to violence and destruction, tearing whatever was within reach. Patient developed enormous gluttony. His speech was most obscene. Post mortem, two gummata were found at the tip of the left sphenoidal lobe in the thickened dura mater, adhering to the brain substance.

WILLIAM BOYD and STANLEY HOPWOOD (" Lancet," 1913) :

A man, age forty-seven, by trade a moulder, suffering from chronic mania, a useful and capable worker in the asylum, though weak-minded and having auditory hallucinations. He had periodic attacks of noisy excitement and at times became very abusive. He died after ten years' residence. Post mortem, the greater part of the left temporal lobe was replaced by a large cyst. Remainder of brain normal.

Case of Tumour of Temporal Lobe mistaken for "Hysteria."

A. HUGHES BENNET ("Brain," 1878):

Miss A., a young lady, age sixteen, at the first consultation complained chiefly of blindness and loss of power in her lower extremities. Father had suffered from acute mania. Patient in her extreme youth exhibited unusual sharpness and intelligence, generally exercised for mischievousness or destructive purposes. She was always a "very naughty child," who took a special delight in annoying and playing mischievous tricks on her companions and relatives. She was unusually developed for her age, physically and mentally, and she still retained her reputation for wilfulness, cunning, and bad temper, although she could make herself amiable and agreeable if she liked. She had been expelled from school for misconduct. Six months prior to the consultation, being apparently in robust health, while in an angry fit and sulking after correction for misdemeanour, she became suddenly blind. It was thought she was malingering, and, indeed, a few days afterwards, she recovered her sight. She had a second attack of blindness, and in addition deafness, which lasted some weeks, when she regained her hearing, but not her sight. Several physicians diagnosed "hysteria." Four months later she also lost power over her lower limbs. Every now and then she had attacks lasting from one to three hours, which had all the appearance of hysterical fits, involving shouting, laughing, crying, throwing herself about, striking the nurse, etc. Later on she became restless and greatly excited, chiefly at night, and frequently alarmed the household by crying aloud and getting out of bed. The excitement continued to increase, until on the third day there supervened mind-wandering and delusions. She was now totally blind, deaf, and could not stand on or move her limbs. She did not know anyone. She complained of violent headache. On the fifteenth day she became unconscious and wildly delirious, until she died on the twenty-fourth day. At the autopsy all the organs were found healthy, except the brain. A tumour, the size of a hen's egg, was discovered in the medullary substance of the temporo-sphenoidal lobe, highly vascular, with extravasation of blood on its surface.

Another Case of Tumour of Temporal Lobe mistaken for "Hysteria."

ALEXANDER BRUCE ("Brain," 1883):

L. M., age forty-five, single, previously a nurse, until two years prior to consultation had been remarkably healthy, of a cheerful and kindly disposition. Then it was first noticed that she had become nervous and excitable. Six months later patient began to grow very selfish, irritable, and jealous of her sisters, and had grown so passionate as to be almost unbearable at home. Then for nine months she seemed to be in perfect health, and held a situation as nurse. Then, however, she began to get excitable, and to quarrel without cause with her fellow-servants. Finally her excitement became so great that she alarmed everyone by rushing about the house at night screaming. Two physicians diagnosed "hysteria," and a surgeon thought her simply excitable and recommended her to go to the country for a time. There she had her usual fit of laughing and crying, especially the latter, for no apparent reason, and the medical man who had been summoned, again assuming hysteria, recommended treatment by "firmness with kindness." Two months later she had what appeared to be an attack of paralysis, but what was thought by the physicians to be either functional or "shamming." She was removed, however, to the infirmary, where she died the following month. The autopsy revealed a tumour extending from the tip of the left temporo-sphenoidal lobe to the junction of the anterior with the middle third of the pons, pushing the convolutions of the temporo-sphenoidal lobe outwards and pressing on pons and medulla.

More Cases of Temporal Tumours mistaken for "Hysteria."

Sir W. T. GAIRDNER ("British Medical Journal," 1877):
Woman, age thirty, diagnosis hysteria, tumour left inferior temporal convolution.
BRAULT and LOEPER ("Arch. Gén. de Médecine," 1900):
Case of mistaken hysteria. Tumour right inferior temporal convolution.

BALL, "Buffalo Medical Journal," 1898:
Girl, age sixteen, supposed hysteria; tumour right temporal lobe.

Temporal Tumour with Mania and Convulsions.

JACOB WEISS ("Wiener Medizinische Wochenschrift," 1877):
H. D. F., a potter's assistant, age fifty-one, was on admission in a state of acute maniacal fury. He tore the clothes off his body, jumped and rolled about on the floor, shouting, kicking, biting, and rendered a medical examination impossible. It was ascertained that patient had clonic convulsions of his right extremities for a year, and that the fits during the last few weeks had continued daily. The maniacal excitement went on day and night, patient striking the door so violently with his hands and feet as to produce numerous excoriations. In the end he got exhausted, fever set in, strabismus divergens, and facial paralysis on left side. He died of pneumonia a month after admission. The post-mortem examination revealed a tumour, size of a walnut, embedded in the left temporal lobe, and extending along the base to anterior part of the pons and left crus.

Tumour of Temporal Lobe with Violent Mania and Epilepsy.

T. S. CLOUSTON ("Journal of Mental Science," 1872):
J. R., male, age thirty-eight, married, butcher. No hereditary predisposition. Had shown symptoms of insanity for four years. His first mental symptoms seem to have consisted of a change in temper, great irritability, and an altered affection for his wife and family. His first bodily symptoms were intense headache, slight deafness and gradually increasing blindness. He had been getting mentally much worse, being excessively irritable, violent towards his wife and daughters, very abusive and foul in his language, and then accusing his wife of all such violence. During twelve months before admission he had had several epileptic attacks. On admission he proved sharp and intelligent, and had no delusions; the gait was that of a tipsy man. He was quite blind, and deaf in his right ear. In nine months his legs were paralysed. It was noticed during the first fortnight that on the very slightest provocation he became wild with passion, completely losing control over himself and capable of doing any violence to those about him. The excessive irritability with violent paroxysms of passion, often coming on without cause, were his chief mental characteristics during the remainder of his life. He died ten months after admission. Post mortem, a tumour was found attached to the right temporal bone, having disorganised the internal ear of that side, and having caused complete softening of the temporo-sphenoidal lobe by pressure.

More Tumours of Temporal Lobes with Violent Mania and Epilepsy.

J. B. TROWBRIDGE ("Neurologisches Centralblatt," 1881):
Acute mania and epilepsy. Cyst in right temporal lobe.
B. M. McDOWALL ("Rivista di Freniatria," 1889):
Epileptic mania, very dangerous, homicidal. Tumour of left temporal lobe and hippocampus.
RUSSELL ("Medical Times and Gazette," 1873):
Maniacal excitement, threatening, epilepsy. Post mortem, cyst middle of base of left temporal lobe.
KAPLAN ("Allg. Zeitschrift f. Psychiatrie," 1898):
Spinster, age thirty-two, bad-tempered, abusive, quarrelsome, later epileptic. Sarcoma of left inferior temporal convolution.

Other Examples of Temporal Tumours with Violent Mania, and most of them with Homicidal Tendencies.

MILLS and McCONNEL, *Journal of Nervous and Mental Disease*, 1895.
F. X. DERCUM, *ibidem*, 1912.
S. J. SHARKEY, *ibidem*, 1889.
J. B. TROWBRIDGE, *ibidem*, 1891.
J. RORIE, *Journal of Mental Science*, 1890.

B. M. McDOWALL, *ibidem*, 1881.
W. H. PACKER, *ibidem*, 1882.
CONOLLY NORMAN, two cases. *Ibidem*, 1890 and 1893.
J. RUSSEL, *Medical Times*, 1875.
Sir JAS. CRICHTON-BROWNE, *British Medical Journal*, 1873.
Sir W. T. GAIRDNER, 2 cases. *Ibidem*, 1873 and 1877.
J. A. ARBUCKLE, *Glasgow Medical Journal*, 1876.
Sir SAMUEL WILKS, *Guy's Hospital Reports*, 1866.
H. M. HURD, *American Journal of Insanity*, 1896.
OTTO SNELL, *Allg. Zeitschrift f. Psychiatrie*, 1875.
A. RICHTER, *ibidem*, 1883.
J. JENSEN, *ibidem*, 1889.
W. FRANKEL, *ibidem*, 1896.
E. K. HOFFMANN, *Zeitschrift f. rat. Medizin*, 1869.
K. OPPENHEIM, *Archiv f. Psychiatrie*, 1877.
M. HUPPERT, *Archiv der Heilkunde*, 1875.
ROUSSEAU, 2 cases. *L'Encéphale*, 1888.
E. CHAMBARD, *ibidem*, 1881.
H. LUTZ, *Bayr. Aerztl. Intelligenzblatt*, 1864.
GEOFFREY, *Annales Médico-Psychologiques*, 1865.
BALL, *ibidem*, 1876.
C. BOUCHET, *ibidem*, 1853.
C. BAUZE, *Jahrbuch f. Kinderheilkunde*, 1876.

Cases of Tumours in Lateral Ventricles, etc., with Oedema of Temporal Lobes.

ALFRED H. MARTIN, *British Medical Journal*, 1875.
W. B. RANSOME, *Brain*, 1895.
J. P. FALRET, *Bullet. de la Société Anatomique de Paris*, 1866.
N. FRIEDREICH, *Intracranial Tumours*, Würzburg, 1853.
M. ROSENTHAL, *Med. Jahrb. der Ges. d. Aerzte z. Wien*, 1882.
A. HOLLANDER, *Jahrbücher d. Psychiatrie*, vol. iii.
F. K. STAHL, 6 cases. *Allg. Zeitschrift f. Psychiatrie*, 1869-1873.
C. FÜRSTNER, *Archiv f. Psychiatrie*, 1875.
GOTTFRIED JEHN, 3 cases. *Ibidem*, 1878.

EXAMPLES OF INFLAMMATION AND SOFTENING OF THE TEMPORAL LOBES WITH VIOLENT AND HOMICIDAL MANIA

H. SCHÜLE ("Sectionsergebnisse bei Geisteskranken," Leipsic, 1874). Three cases, of which one is quoted herewith :

M. M., age thirty, was admitted on account of an increasing mental excitability and intense headache. He soon became violently maniacal, with a stormy motor restlessness, shouting, and destroying everything in the room, and threatening those approaching him. Opium relieved him only temporarily, then the scenes of violence and destruction began anew. Pulse and temperature arose proportionately with the degree of excitement. Much grinding of teeth. No paresis. Two months after admission he died from convulsions. Post mortem, the anterior part of the temporal lobe and the whole of its base was found softened. Basal ganglia not involved.

B. ASCHER ("Allg. Zeitschrift f. Psychiatrie," 1893) :

A man, age forty-five, was admitted on account of violent mania. The post-mortem examination revealed softening of both temporal lobes, more marked in the left than in the right.

J. MacKENZIE BACON ("Journal of Mental Science," 1869) :

William G., age fifty-seven, kept well till within a few days of his admission into the Cambridgeshire Asylum, when he became noisy and excited. When admitted he was in a state of restless delirium. He was fed with the greatest trouble, resisting all efforts in a blind fury, without any particular object. He died after eleven days. On removing the dura mater there was thick greenish lymph, limited to the left middle fossa of the base of the skull.

FURSTNER and STÜHLINGER ("Archiv f. Psychiatrie," 1886) :

Reibold, a married woman, age forty-seven, irascible from childhood, in continuous conflict with her husband. On admission noisy, abusive, aggressive. Died after eight months. Post mortem, the left temporal lobe was bulging, and both temporal lobes were tougher than usual. They had a yellowish discoloration and numerous granules on their surface, the size of pins' heads.

CLOVIS GALLOPIN ("Annales Médico-Psych.," 1879) :

Louis Cheval, age sixty-one, admitted for violent mania, cried and shouted all night long. Six days after found dead in bed. Post mortem, softening of left temporal lobe was found.

WM. JULIUS MICKLE ("Journal of Mental Science," 1880). Four cases, of which one is quoted herewith :

J. M., soldier, age thirty-three, developed suddenly homicidal impulses. On admission restless, meddlesome, irritable, quarrelsome, foul and obscene in his language, and dirty in his habits. Post mortem, marked changes in the middle fossæ, where there was a false membrane and the temporo-sphenoidal lobes were eroded. There had been tenderness over the temples during his illness.

T. DUNCAN GREENLEES ("American Journal of Insanity," 1887). Two cases, of which this is one :

Hannah Eliza F., age fifty-six, single, was suffering from acute mania, but remained coherent. Died in an apoplectic seizure after five years' residence. Post mortem, softening of the left temporo-sphenoidal lobe was found, and blocking of left meningeal artery.

Case of Destruction of Left Temporal Lobe without Sensory Aphasia.

ADOLF KUSSMAUL ("Berliner Klinische Wochenschrift," 1885) :

Woman, age sixty-three, could hear quite well, read letters and newspapers, and spoke German and French fluently. Nothing was remarked of her mental condition, save that for the last two years her character had changed. She was selfish and quarrelsome. She died of abdominal trouble. On examination there was found wanting the greater part of the left temporo-sphenoidal lobe, including the half of the Wernicke's sensory speech centre (she was right-handed), without either the comprehension or the utterance of words or the power of hearing in either ear being injured.

Lesion of Temporal Lobe with Irascibility.

ALBERT M. BARRETT ("Journal of Nervous and Mental Disease," 1910) describes the case of a man, named Taft, a good business man, who enjoyed perfect health till he was about forty-five. Then he became weak in his legs. He gave up business at fifty-two. "For some years previous there had been developing an increasing *crankiness* in his disposition and he showed a number of eccentricities of conduct, such as doing little things to *annoy his family*—as shouting, whistling, and slamming doors. In more recent years these peculiarities became more pronounced." Otherwise he retained his mental capacity up to the age of sixty-seven, when he became word-deaf and lost the use of his legs. "Throughout his illness he was *irritable* and *fault-finding*." Post mortem, the posterior portions of the right and left first temporal convolutions showed signs of softening and were sunken inwards.

Other Cases of Softening of Temporal Area with Violent and Homicidal Mania.

BYROM BRAMWELL, *Edinburgh Medical Journal*, 1879.
R. B. MITCHELL, *ibidem*, 1883.
M. MARIANI, *Archiv. Ital. per le Mal. Nerv.*, 1886.
RASORI, *Centralblatt*, vol. xiv.
STUCKLE, *Allg. Zeitschrift f. Psychiatrie*, vol. xiii.
H. VOPPEL, *ibidem*, vol. xiv.
C. FROHLICH, two cases. *Ibidem*, 1875.
L. WILLE, *ibidem*, 1875.

G. H. BERGMANN, *ibidem*, vol. iii.
TH. ZACHER, *Archiv f. Psychiatrie*, 1888.
A. ALZHEIMER, *ibidem*, 1897.
M. KÖPPEN, two cases. *Ibidem*, 1896.
J. B. TROWBRIDGE, *Journal of Nervous and Mental Disease*, 1891.
CHARLES L. DANA, *ibidem*, 1889.
O. KÖRNER, *Berl. Klinische Wochenschrift*, 1885.
H. LUTZ, *Bayr. Aerztl. Intelligenzblatt*, 1864.
J. LUYS, *L'Encéphale*, 1891.
LABORI, *Bullet. de la Soc. Anatom.*, 1867.
J. CHRISTIAN, *Annales Médico-Psychologiques*, 1874.
T. R. GLYN, *British Medical Journal*, 1878.
H. ZINGERLE, *Journal f. Psych. und Neurologie*, 1911.
ANGLADE, *Gazette Médicale de Bordeaux*, 1911.
WM. BOYD and S. HOPWOOD, *Lancet*, 1913.
LAUDER LINDSAY, *Murray's Royal Asylum Report*, 1860.
KENNETH McLEOD, *Journal of Mental Science*, 1861.
F. NEEDHAM, *ibidem*, 1872.
W. R. WOOD, *ibidem*, 1884.
BLEYNIE, *Dissertation sur l'Inflammation du Cerveau.*
T. D. GREENLEES, two cases. *American Journal of Insanity*, 1887.
ADOLPH MEYER, *ibidem*, 1895.
Sir G. H. SAVAGE, *Brain*, 1879.
A. ROSENTHAL, two cases. *Centralblatt f. Nervenheilkunde*, 1884 and 1889.

Examples of Hæmorrhage into Temporal Fossæ.

H. VOPPEL, two cases. *Allg. Zeitschrift f. Psychiatrie*, vol. xiv.
A. EICHHOLT, *ibidem*, 1885.
E. KUNDT, three cases. *Ibidem*, 1894.
T. KREBS, *ibidem*, 1895.
E. K. HOFFMANN, *Vierteljahrschrift f. Psychiatrie*, vol. ii.
H. T. TILING, *St. Petersburg Med. Wochenschrift*, 1879.
M. A. FOVILLE, *Annales Médico-psychologiques*, 1871.
J. B. ANDREWS, *American Journal of Insanity*, vol. xxv.
T. KIRKBRIDE, *ibidem*, 1879.
F. L. A. KELP, *Deutsches Archiv f. Klin. Medizin*, 1872.

A Medico-Legal Case of Homicidal Mania and Epilepsy with Post Mortem.

STUCKLE ("Allg. Zeitschrift f. Psychiatrie," vol. xiii.):

J. D., an epileptic, married, father of three children, was much ill-treated in his youth by his father, who was of violent temper. He often lost consciousness after severe chastisement. Patient studied well, was good-natured, sociable, industrious, and economical. Epileptiform convulsions commenced in his twentieth year, and simultaneously with them his character changed. He became less sociable, irascible, and inasmuch as his business brought him into public-houses, his irascibility was thought to be due to drink. When twenty-six years old he had an attack of mania furiosa, lasting several days, during which he was restrained. The attacks recurred every three or four weeks. A private physician who took charge of him seemed to have cured him for a time. He married shortly after this cure. The year after the attacks of rage recurred and grew more frequent. They were accompanied by oaths and threats against his nearest relatives. He was frequently restrained. In his lucid intervals he was very religious. Two years after marriage, now in his twenty-ninth year, he locked a woman, whom he employed in business, in his room, where a prayer-book and some butcher's knives were lying on the table, and told her that she would have to suffer with her life for her want of piety, and that he was destined to kill her. Her cries for help saved her life, but she lost an eye in the adventure. The raging maniac was handcuffed and locked up. The following year he was again sent to a private asylum for his repeated attacks of mania, and was once more discharged as normal. Immediately on his arrival home he

threatened his brother-in-law, was again arrested and again sent to a private asylum, and then to another, and finally died in the State asylum in his thirty-sixth year. Post mortem, osteophites were found in the middle fossa of the skull, and the lateral ventricles were very much dilated.

A Case of Pyromania and Homicidal Mania and Epilepsy with Post Mortem.

FR. MESCHEDE ("Allg. Zeitschrift f. Psychiatrie," 1873):

Natalie X., an epileptic girl, age seventeen. She showed a tendency to mischief a year before her admission. She stuck a knife into the lungs of her father's horse; another time she cut up a perfectly new dress, and another time unchained a dog known for his viciousness. She frequently laid fire, and on each occasion said she could not resist the impulse: she felt she had to do it. She learnt well at school, but had to be removed because of her interrupting the lessons. Her father thought her a wicked child and punished her, but she did not appear to feel the chastisement. An aunt of hers in another town took charge of her, until she was caught one night attempting to pierce the eyes of the children with a hairpin. After the injury was done she confessed that an inner voice prompted her to do so. She made several more attempts to set on fire. Several experts had examined her, and advised her being consigned to an asylum. At the institution she had a mania for taking hold of burning objects, and collected all the matches. During the Christmas festivities, when supervision was somewhat relaxed, for precaution sake her bed was examined, and a collection ot matches was found in it. Even when she was free from fits she was very noisy and aggressive, beating, kicking and scratching other patients. She kicked a can of oil over, tore numerous dresses, and notwithstanding the supervision, succeeded in hiding objects with which she could lay fire. She had otorrhœa dextra, which increased latterly very much. She died of miliary tuberculosis. Altogether she succeeded in causing fires six times. The autopsy revealed a prominent osteophite in the form of a crest in the middle fossa. The arachnoid membrane was turbid and remarkably thick at the temporal lobes, which were firm and hard.

Another Case of Epilepsy with Homicidal Impulses.

The SAME AUTHOR (*ibidem*):

Martin Kluszikowski, an epileptic, age eighteen, with perfect calm, without motive or cause, loved to injure people. He had the mien of a cat; the noiseless, elastic tread and treacherous glance, but otherwise he seemed harmless. His derangement showed itself mainly in impulses of harmful mischief and in attempts to cause personal injury. They were not accompanied or preceded by feelings of rage or anger; not done blindly nor noisily—as is common with epileptics; they were committed slyly, as if in gratification of some morbid impulse or desire. He appeared conscious that he was doing wrong. The cat-like seizure of opportunities to do wrong made him highly dangerous. Thus, a workman was putting down a file for a moment, which the patient promptly seized, and stabbed another patient with it in the back. The autopsy revealed basal meningitis, limited to the middle fossa. All the membranes were adherent in this region, both to the skull and brain, and the cornu ammonis was sclerotic.

Other Cases of Osteophites in Temporal Region with Epilepsy and Violent Mania.

LUDWIG MEYER ("Archiv f. Psychiatrie," 1872):

Heinrich S., joiner, age thirty-six, married, fell into the street from a window he was repairing. He seemed uninjured except for a superficial contusion, but from the right ear flowed fluid, and on recovery from the shock there was impairment of hearing. Later on he had difficulty of hearing also on the left side. Some weeks later he had general convulsions. His character changed and he was easily roused to violence, attacking his wife and friends, and destroying the contents of a room. At the institution he so often attacked his fellow-patients that he had frequently to be isolated. He had an apoplectic stroke and died four years after the accident. Post mortem there were several large and sharp exostoses in the right middle fossa with localised pachymeningitis.

T. S. CLOUSTON ("Journal of Mental Science," 1875):

T. M., thirty-eight years old, admitted six months after severe epileptic fits, coherent, but intensely irritable, would strike out at anyone on the slightest provocation or contradiction. Irritability greatest after the fits. Used foul abuse and most vituperative language, if he did not strike, at the refusal of a request. Post mortem, osteophites in temporal bone, dura thickened, and lower parts of temporo-sphenoidal lobes atrophied.

The SAME AUTHOR (*ibidem*):

D. G., engineer, age thirty, five years an epileptic, after a fall on the left side of the head in a ship. He had been very dangerous and violent to those near him, In the asylum very irritable and violent in an impulsive way. Post mortem. irregular excrescences in squamous portion of left temporal bone, membranes and brain matted together in this region by fibrous tissue. Temporal convolutions atrophied.

Sir FREDERIC BATEMAN (on "Aphasia," London, 1890):

C. G., a gentleman, age thirty-six, subject for many years to great mental excitement, had to be placed in asylum. There he had convulsions, followed by right hemiplegia and aphasia. Post mortem, exostosis found in middle fossa, with membranes adherent.

Other Examples of Temporal Lesions with Violent Mania and Epilepsy.

ZOHREB, *Allg. Zeitschrift f. Psychiatrie*, 1886.
FEITH, *ibidem*, 1867.
OTTO SNELL, *ibidem*, 1875.
F. LÜHRMANN, *ibidem*, 1896.
Sir SAMUEL WILKS, *Guy's Hospital Reports*, 1866.
A. CULLÈRRE, *Annales Médico-Psychologiques*, 1890.
M. FOVILLE, *ibidem*, 1882.
W. J. MICKLE, *Journal of Mental Science*, 1881.
S. W. D. WILLIAMS, *ibidem*, 1869.
T. B. WORTHINGTON, *ibidem*, 1880.
W. R. WOOD, *ibidem*, 1884.
FRANK HAY, *ibidem*, 1895.
A. TAMBURINI, *Rivista Sper. di Freniatria*, vol. v.
C. BOUCHET, several cases. *De l'Épilepsie.*
BOURNEVILLE and D'OLLIER, two cases. *Récherches sur l'Èpilepsie*, Paris, 1881.
BECK, *Archiv f. Psychiatrie*, vol. xv.
T. CRISP ENGLISH, *Lancet*, 1904.
J. S. BOLTON, several cases. *Journal of Mental Science*, 1905.

EXAMPLES OF CHRONIC MIDDLE EAR DISEASE WITH VIOLENT AND HOMICIDAL MANIA

Observation by the Author. Medico-Legal Case.

A highly esteemed and widely-known professional man, a devoted husband and father, killed one day his wife and both his daughters, ten and thirteen years respectively, by cutting their throats. He then took his own life. There were signs of a struggle with the victims, but no evidence that there had been a quarrel beforehand. Indeed, his brother had spoken to him a few hours before, and at the inquest declared that he found him in full possession of his reason and with his usual amiable character. Nor had he any cares or sorrows. Patient suffered from a chronic abscess in the ear, for which he had already once been operated upon, and for which he was still under treatment. The inflammation had extended to the adjacent brain.

Another Medico-Legal Case.

K. CRAMER ("Gerichtliche Psychiatrie"):

The wife of a working man, age thirty-two, family history normal, suffering from disturbance of the inner ear, after a confinement in which she lost a great deal of blood, heard voices: "You must cut the throats of your children." The voices became more powerful, until they took entire possession of her, so that she could no longer resist, and, with a large kitchen knife, she cut the throats of her children, of whom she had so far been the loving mother.

Still Another Medico-Legal Case.

"American Journal of Insanity," vol. v., p. 34.:

William Freeman, a servant. Several members of his family were insane. At the age of sixteen he was sentenced to five years' imprisonment for stealing a horse. It was the general opinion that he was innocent of the charge. Whilst in prison, Freeman was struck a severe blow over the side of the head, which caused a chronic purulent discharge from the ear and deafness. The unjust imprisonment seemed constantly to prey on his mind, and when he left the prison at the expiration of his sentence he sought compensation, but in vain. Remuneration with him was the one idea. He enjoyed three years' liberty. During this time he is reported never to have spoken much and to have spoken only when addressed; never to have asked any questions, and to have answered very briefly those put to him. He was now twenty-two years of age. One evening he armed himself with a common butcher's knife and left his lodging, no one knowing for what purpose. After examining two or three premises he finally selected those of Mr. Van Nest as the proper place to begin "his work," as he termed it, and there massacred Mr. Van Nest, his wife, one child age two years, and Mrs. Wyckoff, age seventy. He stabbed another man, Mr. Van Arsdale, in the chest, who subsequently recovered. In the affray he entered every room in the house, both above and below, but took nothing away. He went to the stable, unfastened and mounted a horse, and was some rods from the scene of devastation in the incredibly short period of not more than five minutes from the time of entering the house, as was proved in evidence. Three days afterwards he was committed to jail to await his trial. The excitement caused by the killing of a well-known family, the character of the act, the plea of insanity which was made in defence, the protracted trial, the reputation of the distinguished counsel (Van Buren), and the number and standing of the medical witnesses called all conspired to give the case an unusual interest. Freeman died of phthisis while under trial. The post-mortem examination revealed caries of the inner part of the petrous portion of the left temporal bone. The dura mater covering this portion of the skull was red and congested, and the internal structure of the ear was mostly obliterated. There was also a collection of fœtid pus in the cavity of the bone having no connection with the external ear. These changes, it was proved, were consequent upon the injury Freeman received when an inmate of the State prison; he was struck on the head with a board, the blow splitting the weapon into fragments. The medical opinion was that this injury was the cause of the diseased condition of the brain and of the violent and sudden derangement for which the defendant was on trial.

Case of Middle Ear Disease in a Boy leading to Violence and Destructive Tendencies.

E. BOUCHUT ("Gazette des Hôpitaux," 1877):

The wife of an English naval officer brought to him her boy, age six. When three years old the boy had measles and chronic bronchitis. Two years later he was sent to Nice for cure. He there had scarlet fever, and after recovery otorrhœa of the left side, which had lasted for three months. Since this otorrhœa he heard indistinctly with that ear, suffered with his head, and had nervous crises, several in a day and even during the night. No vertigo nor loss of consciousness, no vomiting. He became wild, yelled furiously, and threw himself on his mother, kicking her and striking her with his fists. His attacks were made as if he meant to kill her. He smashed everything he could lay his hands on. After that he became calm again, began to cry, embraced his mother, until the next storm broke out shortly afterwards with exactly the same symptoms. The noise he made was so great that the hotel people would not allow his mother to stay any longer, and she had to seek apartments elsewhere. She was recommended to reside with a medical man, and during

residence there the same violent scenes occurred as before. Before the treatment was concluded the mother returned to England with her son.

Other Examples of Violent Mania due to Ear Disease.

E. GRISSOM, *American Journal of Insanity*, 1877.
G. C. BABLETT, two cases. *Ibidem*, 1877.
H. SPITTA, homicidal. Medico-legal case. *Praktische Beitrage zur Ger. Ärztl. Psychologie.*
JANSEN, *Berliner Klinische Wochenschrift*, 1891.
L. SCHLAGER, *Zeitschrift d. Ges. d. Aerzte zu Wien*, vol. xiii.
HOMER, *Monatsschrift f. Ohrenheilkunde*, 1863.
WM. MacCORMAC, *Lancet*, 1886.
G. FABRI, *Italia Medica*, 1883.
H. SCHULE, three cases. *Handbuch d. Geisteskrankheiten*, 1878.
H. KUKARZEWSKI, *Progrès Médical*, 1894.
W. H. BENNETT, *Dublin Quarterly Journal of Medical Science*, 1871.
A. BABINSKY, *Languedoc Médical*, 1891.
EDWIN W. DAY, two cases. *Annals of Otology*, 1911.

In view of the above cases, the frequency of homicide in ear disease is not surprising. Recently I have collected a number of cases committed by deaf-mutes. They have certain features in common. As in most of the cases quoted, the murder is committed with unwonted brutality, more than one person may be attacked, sometimes perfect strangers, and not infrequently the guilty person attempts suicide after the deed. Still, in strict accordance with the law, these afflicted persons are sentenced to death or varying terms of hard labour.

A FEW EXAMPLES OF SENSORY APHASIA WITH VIOLENT MANIA

GIUSEPPI SEPPILLI ("Rivista Sperimentali di Freniatria," 1884):
A widow, age fifty-one, entered the hospital in a state of violent mania. She suffered from word-deafness, though her hearing was perfect. Her mental faculties after the subsidence of the attack seemed unimpaired. Post mortem, the membranes were adherent over the first and part of the second convolutions of the left temporal lobe.
ALBERT ROSENTHAL ("Centralblatt f. Nervenheilkunde," 1886):
Engineer, age forty-three, suffered from sensory aphasia. Two years later violent maniacal excitement. He was easily aroused to anger, became dangerous and destructive. Post mortem, the left temporo-sphenoidal lobe, particularly the inferior convolution, was so softened that it was washed away by a jet of water.
The SAME AUTHOR (*ibidem*, 1889):
F. K., age thirty-nine, had an apoplectic stroke, followed by hemiplegia on right side, sensory aphasia, inability to count ten, though formerly a good arithmetician. Agitated mental condition. Left temporal lobe, especially superior and middle temporal convolutions, atrophic.
L. BIANCHI ("La Emiplegia," Naples):
Cerbone J., age sixty-one, a working man of low type, always fighting, violent, quarrelsome, woke one morning with sensory aphasia. Though hearing well, he could not understand a single word spoken. The upper half of the left temporal lobe was found softened.

Other Examples of Sensory Aphasia with Violent Mania.

H. LIEPMANN, homicidal. *Neurologisches Centralblatt*, 1900.
LEOP. LACQUER, *Neurologisches Centralblatt*, 1888.
BANCROFT, *American Journal of Insanity*, 1879.
W. L. WORCESTER, *ibidem*, 1896.
SCHÄFER, *Centralblatt f. Nervenheilkunde*, 1881.
M. BERNHARDT, *ibidem*, 1882.

A. PICK, *Archiv f. Psychiatrie*, 1892.
E. BISCHOFF, three cases. *Ibidem*, 1889.
L. BRUNS, *Allg. Zeitschrift f. Psychiatrie*, 1892.
G. HEBOLD, *ibidem*, 1894.
J. FRITSCH, *Wiener Mediz. Presse*, 1879.
F. BAIZER, *Gazette Médicale de Paris*, 1884.
MILLS and McCONNELL, homicidal. *Journal of Nervous and Mental Disease*, 1895.
A. M. BARRETT, *ibidem*, 1910.

CASE OF ABNORMAL DEVELOPMENT OF THE TEMPORAL LOBES

WARREN L. BABCOCK ("State Hospitals' Bulletin," New York, 1896):

F. C., female, age thirty-one, single, habits good, tendencies destructive and criminal in character. During childhood she was eccentric and unruly, markedly disobedient, perverse in her tastes, irritable on slight provocation, and when angered would fly into a passion, become destructive and greatly overwrought. This would soon pass away, but it was noticed as the child grew older she became worse, less susceptible to control, and developed sundry degenerate traits of character. From the father's statement, it seems that the girl reached the age of eighteen without very serious trouble, maintaining fair self-control with only an occasional manifestation of viciousness. At the latter age, however, she had a serious outbreak and for several weeks lost entire control of her mischievous and perverse tendencies. This was followed by a somewhat tumultuous interval of four years, at the end of which she again had an outbreak extending over a like period of time. She threatened her parents with a knife, broke dishes and furniture, and was a menace to the family safety except when in the presence of her father. Through the earlier months of her residence in the hospital she was subject to paroxysms of fury and destructiveness, during which she was mischievous, vicious, and subject to great mental restlessness. During one of these she seized a bottle of camphor and chloral liniment from a nurse and drank a portion without subsequent injury. She repeated this rash act immediately afterwards, and regretted that she was unable to control her impulses. She remained excited and disturbed for four months, and then began to improve rapidly, becoming quiet, orderly, and finally manifesting few perverse tendencies. Second admission, constituting her fourth outbreak, was after an interval of three years. During this period she was turbulent and mischievous, but maintained fair control. Her second residence in the hospital was marked by a repetition of her former excesses. If anything, this last attack was marked by an increase in vicious and destructive tendencies, sometimes premeditated, while others had the appearance of being entirely impulsive. She would emphatically deny all of her behaviour which was unobserved but readily traceable to her as the offender. When discovered in any of her depredations, she acknowledged her guilt with profuse regrets, and promised to restrain herself in future, but, nevertheless, would take the first opportunity and from time to time attack slyly fellow-patients when nurses were not looking. One minute she would talk sociably and kindly with an associate, while the next, if unobserved, or if the converser's attention was distraught, she would strike a violent blow with anything which might be ready at hand to inflict injury. She seemed to appreciate the enormity of her offences, and regretted her lack of self-control. She was a confirmed kleptomaniac, and exhibited a high degree of secretiveness following upon her lapses. She was also a pyromaniac, having on one occasion set fire to her father's residence. It was observed that she had excessive bulging of the temporal bone on the right side, making the head prominently asymmetrical.

Other Cases of Abnormal Development of Temporal Lobe.

ARNOLD PICK ("Prager Mediz. Wochenschrift," 1879):

Patient was brought to the asylum strapped down on an ambulance by the police, he having become suddenly acutely maniacal, threatening to kill someone,

and could only be overcome by the combined strength of several men. On the following day patient was calm and perfectly normal. He gave his history correctly, and stated that he always got easily excited to acute anger, but that the anger as rapidly disappeared. The cause in this case arose within himself; some reflections about past events made him angry, and his fury increased at the attempts of wife and friends to pacify him. On examination an asymmetry of the head was noticed. The left temporal bone bulged so much that it formed a perfect groove at its junction with the frontal and parietal bones. No other evidence of disease or other abnormality could be found.

H. VOPPEL ("Allg. Zeitschrift f. Psychiatrie," vol. xiv.), published several such cases.

Cases of Hæmatoma Auris in Violent Mania.

E. H. VAN DEUSEN ("American Journal of Insanity," 1874):

A young farmer of good constitution, age twenty-one, was seized with acute mania, persistent destructiveness of everything within reach and incessant motion. Five weeks after admission well-marked hæmatomata occurred in both ears, passing through the usual stages and terminating in the characteristic disfigurement. It was followed by an abatement of the excitement, convalescence was established, and he was discharged recovered. He continued in good health.

MacDONALD (*ibidem*, 1887):

Patient, age eighteen, maniacal and violent. This was his second admission, when he developed double hæmatomata, which increased rapidly and were apparently painless. In each case the swelling was confined to the concha, giving a very peculiar appearance. Absorption was rapid and at the end of a month the tumours had nearly disappeared, leaving the usual thickening. At the same time the mental disturbance had gradually subsided and convalescence was established. The patient was observed for the three years following his illness, he being a prisoner, and he kept perfectly well during that time.

Other Cases of Hæmatoma Auris in Violent Mania with Recovery recorded by:

TEATS, homicidal. *British Medical Journal*, 1881.
FRED. NEEDHAM, *ibidem*, 1890.
TISHKOFF, *Lancet*, 1892.

CHATELIN and de MARTEL (*op. cit.*) **have made no such observations** as are cited n this chapter. As disciples of PIERRE MARIE, they deny even the existence of vord-deafness in lesions of the temporal area; "not a single case has been observed" by them, whereas about twenty cases have been quoted by me. They acknowledge, however, that the patient "often speaks too much" and that "he presents jargonaphasia," symptoms that are familiar to psychiatrists, being common in acute mania.

The evidence I have quoted in this chapter is also of importance in showing the requency of epilepsy in lesions of the temporal lobes. It should receive more than ursory attention by neurologists.

Dr. RICHARD EAGER (see p. 121 and 145) had only three cases of serious njury in the temporal region. *One* of these suffered from "maniacal excitement," as we should expect; *another* is claimed by him as melancholic, but in reality complained only of pain in the head, and got well on "persuasion." The *third* seemed confused and wandered about aimlessly. There were three other cases of temporal injury, in the posterior region (described in next chapter under "Delusions of Persecution"), and one of these is mentioned as suffering from "an acute hallucinatory state and was for weeks in a state of acute maniacal excitement."

CHAPTER XXXII

OTHER PRIMARY MENTAL DISPOSITIONS AND THEIR CEREBRAL ORIGINS

SUSPICION AND ITS CEREBRAL ORIGIN

IN Chapter XXVII. it has been shown that **a feeling of suspicion is a necessary element of self-preservation.** It varies in degree in different individuals. From the examples of brain lesions which will be quoted it would appear that the upper posterior part of the temporal lobes has some connection with it, *i.e., a part of brain midway between the supra-marginal and angular convolutions of the parietal lobes*—the centres of the emotion of fear—*and the lower part of the temporal lobes*—the centres of the irascible emotion ; consequently both these psychical tendencies may be involved.

Morbid suspiciousness and delusions of persecution can arise, particularly in young people, from other causes than a limited brain lesion, as an exaggeration of a natural disposition to taciturnity and distrustfulness, to seek solitude, to sensitiveness of character, and a hypochondriacal condition. Such people begin to interpret everything that happens in a bad sense and as intended to do them harm. They suspect everybody and everything, and see hostility everywhere and are constantly on their guard, and the most trifling incidents acquire in their eyes an extraordinary importance. Sometimes they begin to imagine that everybody is looking at them or talks about them. All the words they hear they refer to themselves. Gradually they suspect people of spying and listening at the door, and following them when going out. Their mistrust makes them exceedingly reserved. For a time they struggle against their delusions, recognising the possibility that they are such, but gradually their delusions assume a more systematised form ; then they accuse a certain person or persons, authorities or societies of conspiring against them, and for definite reasons, which they can make very plausible. They now think themselves important personages to be the object of so much hate, conspiracy, or other unpleasant attention on the part of their fellow-creatures.

At this stage, or even before, actual **hallucinations** may set in, the principal one being that of **hearing.** Hallucinations of sight are extremely rare in these cases—the sight centre not being in the temporal lobe—but hallucinations of smell and taste are not uncommon, hence the idea of being poisoned. These hallucinations, it will be seen, can be explained on anatomical grounds ; for it will be shown that the lesion found in delusions of persecution is in the temporal lobe, so that the propinquity of the ear will account for the hallucinations of hearing, and, as will also be demonstrated, the gustatory centres are in the same vicinity, and are subject to the same liability of morbid excitement.

W. T. TIGGES (" Allg. Zeitschrift f. Psychiatrie," 1888) has shown that in this form of insanity the weight of the frontal lobes is least diminished, next come the parietal lobes, and the **temporal lobes suffer the greatest diminution.**

Delusions of persecution may occur without any other signs of disease, and they nay occur as complications in melancholia as well as in mania furiosa. The latter wo are merely extensions of disease already existing, from the central parietal area n melancholia and from the inferior temporal area in mania furiosa to the posterior uperior temporal region.

It has been shown in the last chapter that epilepsy frequently involves the emporal lobes. Hence on the one hand the violence and homicidal tendency of nany epileptics, and on the other the hallucinations of hearing and delusions of ersecution. This observation was also made by PARANT ("Archives Cliniques le Bordeaux," 1895).

The proximity of the internal ear to this brain area accounts for hallucinations of earing being so frequent in the delusions and mania of suspicion and persecution—hey are generally of a threatening nature—and also explains why this same morbid nental state may arise when ear disease spreads to the temporal lobe. It is also a ell-known fact that deaf people are particularly subject to ideas of suspicion and ersecution.

It has been observed by several authorities that **chronic middle ear disease may roduce a psychosis.** Whether this connection is dependent on increased intra-ranial pressure, direct meningeal irritation, reflex nervous conditions, or disturbed erebral circulation is not determined. But the fact remains that, in these cases, **ure of the ear disease cures the psychosis,** and if pus is formed and retained the ental defect is aggravated. Hence, whenever we get unreasonable suspicion or elusions of persecution, we should examine for ear disease and inquire for hallucina-ons of hearing. FISHER ("American Journal of Insanity," 1888) found only two xceptions in forty-seven cases of mania of persecution that came under his notice. OUCHERON ("Gazette des Hôpiteaux," 1887) observed mental troubles of spicion and persecution to accompany ear disease. PIERRE MARIE did the me, and so did E. C. LASÈGUE and C. FÜRSTNER. Increased pressure alone ems to suffice to set up delusions; and the moment pus escapes from the ear the ental trouble disappears. This is an observation made by SCHÜLE, KÖPPE, RIESINGER, JACOBI, KÖRNER, HUGUENIN, MOREL, ROBIN, BENNETT, d MacEWEN who have all reported similar cases. REDLICH and KAUFF-ANN found ninety per cent. of paranoia cases among patients suffering from ear ouble. W. S. BRYANT claims fifty per cent., but puts nearly the whole of the maining cases under "dementia."

Dean Swift suffered from middle ear disease, which gave rise to insane suspicion d irritability, and to this may be ascribed his cruelty to Stella.

se of Injury to Posterior Temporal Region with Delusions of Suspicion and Persecution

By THE AUTHOR:

A young South American had been sent to London for a change of scene, after had fractured the mastoid process in a fall from his horse, and had become entally unsound. At first he seemed able to exercise some control, but later, at e time of the consultation, he had secluded himself from all society, and com-ained, amongst other suspicious ideas, chiefly of threatening persecutors. An eration was arranged, but before the day fixed upon he threw himself from a third-or window and was killed.

RECOVERY AFTER SURGICAL OPERATION

By THE AUTHOR:

Patient had chronic ear disease from his childhood. He was mentally quite rmal and an active business man until two years before, when in consequence of as of persecution he changed his occupation rather frequently and succeeded in

none. Getting worse, he refused to eat any food that had not been first tasted by others, and refused to speak with anyone except his nearest relatives, to whom he spoke quite rationally, thus showing that he was suffering from a *disordered state of feeling*, and not of the intellect. An examination was made of his ears. The disease in the right ear was healed, but there was necrosis of the left ear. When he was operated upon, the left temporal bone was found of ivory-like hardness, there was not a trace of mastoid cells, and the bone had to be chiselled through to get at the brain. The dura was thickened and was cut cross-like in two. The wound healed readily, and patient spoke to his attendants directly after the operation. He got perfectly well, and remained so.

W. RHYS WILLIAMS ("Journal of Mental Science," 1879):

D. C., age twenty-six, had enjoyed good health, was industrious and sober until some days before admission, when he became excited, noisy and violent. He was continually swearing and screaming, said he saw devils, and was violent. Six months later it was noticed that he had a profuse purulent discharge from the left ear. He said he had this for months past. Slowly a large puffy swelling formed over the left mastoid process and spread up over squamous portion of temporal bone. On pressing this the discharge ran freely from the meatus. As a rule the patient was sullen and dangerous, and would not allow anyone to examine him. He fancied the doctors wanted to injure him. The following month, the abscess having got still bigger, it was opened, and he became sane at once. No further discharge took place from the ear.

J. M. KÖPPE ("Archiv f. Ohrenheilkunde," 1875):

Richter, a miner, sustained, when thirty-one years of age, a fracture of the base of the cranium, was eight days unconscious, and ill for three months. He became somewhat deaf, and there continued buzzing in the right ear. Two years after the accident he became mentally changed. He suffered from delusions of persecution: people robbed him of everything, intended to poison him, spoke badly of him. He threatened to kill his wife and children and to commit suicide afterwards. The otorrhœa got worse, and with it his delusions. On treating the ear-disease his mental derangement disappeared completely.

E. REGIS ("Annales Médico-Psychologiques," 1882):

A young man, age twenty-two, received, when thirteen years old, such a severe box on the left ear that purulent middle ear disease resulted from it, which became chronic. Typhoid fever in his sixteenth year made the ear disease worse, and he became quite deaf in the left ear. Since then he had hallucinations of hearing of an insulting character: yet the patient was conscious of their origin, and had no delusions about them. Local treatment of the disease made the hallucinations disappear.

B. BALL ("L'Encéphale," 1882):

Similar case with cure.

CHARLES PHELPS ("Traumatic Injuries of the Brain," 1898):

Male, age forty-five, thrown from a truck in a collision, unconscious. Third day ecchymosis over right mastoid process and extending upon the back of the ear. Irrational and required restraint, had delusions, saw imaginary persons, and heard scoffing voices, was easily annoyed when spoken to, considered it an outrage to find himself subjected to having his temperature taken. His mental faculties were completely restored after operation.

W. SOHIER BRYANT ("Annals of Otology," St. Louis, 1905) describes *four* cases of persecutory mania with auditory hallucinations. All recovered after operative treatment.

The same author ("Journal of Nervous and Mental Disease," 1906) has an article on "The Great Psychical Importance of Ear Disease." He again gives numerous examples of purulent inflammation of the middle ear followed by psychoses, which disappeared on treatment of the ear trouble. The following is an example:

"The author has a case of a child, five years old, who has recurrent purulent inflammation of both tympani. If there is any retention of pus, maniacal attacks come on, during which the child makes inarticulate cries, breaks everything within reach and fights desperately with all the members of the family, including those it is most fond of at other times. These seizures are constant during the attack.

Attention to the middle ear conditions and drainage of the pus relieves the cerebral irritation at once."

EDWIN GOODALL ("Lancet," 1898):

Male patient, age twenty-nine, previously healthy, always temperate. No hereditary tendency. Six weeks before admission he received a kick from a horse on the left mastoid process, which rendered him unconscious. He bled from left ear. After coming round he developed marked delusions of suspicion, and exhibited violence, so that he had to be transferred to Hanwell Asylum. Considerable scar over left mastoid process. Complete left facial paralysis. After surgical treatment he became perfectly rational. Discharged three months later, and a month after discharge patient reported himself well and at work.

DAMER HARRISON ("Journal of Mental Science," 1902):

A gentleman, age forty-six, who held an important Government appointment, and was admitted into Haydock Lodge Asylum in 1906. He had suffered for the past year from delusions of persecution of disparaging and threatening character. An operation was decided on in the region of the temporal lobe—auditory centre—on the left side. The brain bulged into the opening of the wound, and on incision into the dura mater a considerable quantity of serum escaped. On the day after the operation the voices appeared to the patient more like a jumble of noises. On the fourth day he could still hear the voices at times, but he was peaceful and comfortable. Instead of being wrapped up in his own misery, he watched what was going on in the room, was inclined to talk, and his manner was bright. On the fifth day the sounds became indistinct and were no longer heard as voices. On the twelfth day the noises too had disappeared, and on the twenty-fourth day he was discharged cured. He reported himself three months later free from relapse.

E. AMBERG ("Journal of Nervous and Mental Disease," 1906):

Auditory hallucinations and persecutory mania. Recovery after treatment of ear affection.

G. BURCKHARDT ("Allg. Zeitschrift f. Psychiatrie," 1891):

Mrs. B., married, healthy up to thirty-fourth year, then became melancholic, suicidal, developed delusions of persecution, and became dangerous to those around her. For sixteen years she remained in this condition in the asylum. Dr. Burckhardt removed a strip of the parietal lobe (gyrus angularis and supra-marginalis—seat of melancholia, see preceding chapter) and a strip of the posterior part of first and second right temporal convolutions (also part of Broca's convolution without influencing her speech). He claims that patient lost her desire for attacks and abuse and her delusions, and instead of the depressed condition she became lively and communicative.

The SAME AUTHOR (*ibidem*):

This subject was a man, age thirty-five, who had been four years in the asylum. He was suspicious, had fear of being poisoned, became threatening, heard voices, and was violent and destructive. Dr. Burckhardt trephined for the auditory centres above left ear, and removed about 2·8 grammes of brain substance. The brain was found of a slate colour. *The patient did not become word-deaf* after this operation, but the hallucinations became less intense and the mental condition improved. He was now perfectly quiet, and took an interest in things.

The SAME AUTHOR (*ibidem*):

M. M., artist, delusions of persecution with hallucinations of hearing which caused irascibility. Auditory area excited, weight of brain removed 4·6 grammes. Patient lost his irascibility. Dr. Burckhardt in a second operation removed another strip, when the patient's mind cleared up. He began to draw again, could play a game of cards and billiards correctly, became polite and obedient.

HENRY MAUDSLEY ("Lessons of Materialism," 1879):

"Some years ago a miner was sent to the Ayrshire District Asylum who, four years before, had been struck to the ground insensible by a mass of falling coal which fractured his skull. He lay unconscious for four days after the accident, then came gradually to himself, and was able in four weeks to resume his work in the pit. But his wife noticed a steadily increasing change for the worse in his character and habits; whereas he had formerly been cheerful, sociable and good-natured, always kind and affectionate to her and his children, he now became irritable, moody, surly,

suspicious, shunning the company of his fellow-workmen, and impatient with her and the children. This bad state increased ; he was often excited, used threats of violence to his wife and others, finally became quite maniacal, attempted to kill them, had a succession of epileptic fits, and was sent to the asylum as a dangerous lunatic. There he showed himself extremely suspicious and surly, entertained a fixed delusion that he was the victim of a conspiracy on the part of his wife and others, and displayed bitter and resentful feelings. At the place where the skull had been fractured there was a well-marked depression of bone, and the depressed portion was eventually removed by the trephine. From that time an improvement took place in his disposition, his old self coming gradually back ; he became cheerful again, active and obliging, regained and displayed all his former affection for his wife and children, and was at last discharged recovered."

TEMPORAL INJURY WITH DELUSIONS OF PERSECUTION

Case of Recovery.

THOMAS DRAPES (" Journal of Mental Science," 1904) :

Patient, age thirty-six, employed at office work, most temperate all his life, always healthy and athletic, an enthusiast about games. Many years ago, when playing football, he got a kick on the left side of his head, just over his ear, and some six months after he began to suffer from deafness, which he attributed to the injury. An eminent London aurist, however, did not attach much importance to this, and seemed to regard the deafness as due to Eustachian obstruction. For a number of years he had some discharge from the ears. He had a slight blow again on the top of the head by a hockey stick, and from that day he was very fidgety and restless, except when under the influence of sleeping draughts. One night, the month following, he sprang over the foot of the bed, imagining he saw men coming in at the door. Another day he saw two men, one in the wardrobe, the other standing opposite the side window, of which the shutters were shut. He seized his hot water jar and flung it with all his force at the latter, as he thought, and it went within a few inches of his sister's head, who was sitting at the fire with her back to him. Had he aimed at the man in the wardrobe, he must have hit her and might have killed her. All this time his hearing was much more acute than normal. He made slow recovery, and as he got better the deafness gradually returned. He wrote afterwards a long account of his delusions, which were connected with a conspiracy.

Medico-Legal Case of Temporal Injury followed by Homicidal Tendencies.

JULIUS KRATTER (" Friedreich's Blätter f. Ger. Medizin," 1889) :

Josef H., while walking with some companions, had, as afterwards was shown, a momentary delusion of persecution, and this delusion incited him to knock one of his friends down, and, when attacked by the other, he stabbed him several times, apparently in self-defence. On arrival home he boasted of his intention to murder thirty persons, and became very noisy and threatening. Numerous witnesses declared H. to be a violent, threatening and dangerous man, and that the change of his character dated from the receipt of an injury to his head. One medical witness declared him to be simulating ; another described him as intellectually very clear-headed, definite in his statements, adhering to them under cross-examination, having a good memory of facts and events, and never contradicting himself. He stated that twenty years before he was run over, and received a severe wound which caused him to be paralysed and speechless for a few weeks, and altogether indisposed for a whole month. A brother of his stated that since that time defendant had been intolerant of alcohol. Defendant remembered every detail of the act he was accused of, but stated definitely that his two companions intended to kill him. Questioned further, he said he was not mad ; he heard them distinctly arranging the plot ; he knew what he was doing, and was not going to let himself be murdered without some self-defence. It was then ascertained that defendant construed some remarks made by his companions in this sense, and when he walked faster to escape them they also followed him more quickly, whereupon he turned

round and fought, with the result given above. In reply to inquiries by the medical experts, he admitted having other enemies in the village, and gave their names and their intentions. Asked why he did not prosecute his enemies, he admitted that he applied for a summons against one of them, but the magistrate would not grant the summons. He believed the magistrate had been bribed. The physical examination revealed the following anomalies: facial paralysis and paresis of sympathicus on right side; over the ear at the junction of the right temporal with the parietal bone there was a depression, the size of a five-shilling piece, holding three fingers easily. Superficial tissues were adherent. Scar not tender but sometimes painful. Right pupil larger than left. Opinion of experts that defendant had suffered for many years from delusions of persecution; that these delusions dated from the injury, and had increased when hallucinations of hearing appeared. Moreover, he construed everything that might be said or done in the sense of his delusion. Since the injury he had grown very irascible. In his anger he often spoke nonsense, and the laughter and remarks caused thereby by those around him only increased his irascibility and delusion. Simulation was declared to be out of the question. In a postscript Dr. Kratter stated that the Court handed the prisoner to the mayor of the district to deal with him as he thought proper. The mayor intended to send him to a lunatic asylum at once, but a superior authority intervened, so that H. was left at large. He immediately resumed his threats and violent behaviour, and to such an extent that the local people had to petition the Government to place H. in an asylum, since he was a public danger. Dr. Kratter added a special certificate. Only then was H. secured.

Another Medico-Legal Case.

W. FRÄNKEL ("Allg. Zeitschrift f. Psychiatrie," 1869):

S. A., a very conscientious woman, age twenty-nine and a half, whose house was burnt, including all her property, which was not insured, interpreted some remarks by the neighbours as meaning that her husband had caused the fire. Fearing his arrest, she got into a state of terror, and left quietly, with her two children, the scene of her misfortune. An hour afterwards her cries were heard from a pond in the neighbourhood, where she had drowned her children and made an unsuccessful attempt to take her own life in the same way. She was arrested. At the trial she remained reticent, but betrayed in every feature and look her extreme anxiety, and gave the judge the impression that she felt her guilt so much that she was afraid to betray herself if she spoke. Expert evidence showed that her silence, refusal of food, sleeplessness, fever, etc., indicated some mental derangement. She was sent to the psychiatrical clinic for further observation. She was found much depressed, but this condition had begun long before the fire. She was hereditarily tainted. On her head in the region of the left parietal bone some ulceration was observed. Her fever increased, and with it her fear of death. She asked for a priest, and confessed to him that she herself laid the fire to get away from the town, which she abhorred, and gave details of the preparations she had made to fix the suspicion on others, which confession left the impression on the judge, to whom she repeated it, that she had told the truth and was not under a delusion. She died of pyæmia. Post mortem, there was a necrosis of the left parietal bone with loose pieces, the parietal lobe being covered with pus, which had made its way to the temporal area and middle fossa. Dr. Fränkel thought the necrosis was the result of an injury.

Another Medico-Legal Case.

A. KÖHLER ("Allg. Zeitschrift f. Psychiatrie," 1877):

A woman, age forty-seven, a habitual thief with long records of imprisonment, whose trials were always interesting by reason of the craftiness with which she planted her guilt on others, became quarrelsome and violent in manner. Four weeks after being discharged she committed another theft, and received one year of hard labour for it. But this time her mental state received notice, and she was sent to an asylum. Her violence was accounted for by horrible delusions of persecution with hallucinations of the same kind; she saw only enemies, detected poison everywhere; but, unlike a melancholic, who would simply refuse to eat, she destroyed the plates

and dishes, and behaved altogether outrageously. She remained in this condition for years. Gradually paralysis set in. She died of phthisis. Post mortem, there was softening of the temporal lobe.

Other Cases of Temporal Lesions with Delusions of Suspicion and Persecution

CONOLLY NORMAN ("Journal of Mental Science," 1894):

Patient, age forty-two, entertained fixed persecutory delusions, chiefly to the effect that people in the jail had put beasts in his inside to torture him; that his chest was full of gnawing beasts, and so forth. He complained bitterly of his treatment, and said that the asylum authorities were conspiring with the prison warders to persecute him. No hallucinations. Post mortem, porencephaly was found involving the greater part of the left temporo-sphenoidal lobe and supra-marginal gyrus, holding sixteen ounces of perfectly clear fluid. The left parietal eminence and left parietal cortex were distinctly more prominent than the right.

ALBERT ROSENTHAL ("Centralblatt f. Nervenheilkunde," 1884):

Patient, age twenty-five, with ear disease, which in three months' time left him deaf. Simultaneously therewith mental derangement took place, the patient having delusions of persecution and attacks of maniacal fury. To escape from his persecutors he made an attempt to jump down from a fourth-floor window. The excitement never abated. Epileptic convulsions followed in such rapid succession that he was dead in a few hours. Post mortem, there was a focus of yellow softening in the right temporal lobe extending to the external capsule.

PAUL SCHÜLLER ("Psychosen nach Kopfverletzungen," Leipsic, 1882):

F. B., age sixteen and a half, an apprentice, with ear disease from his earliest youth, received in a fight a blow with a piece of wood which broke into pieces. It hit him at the posterior junction of the right temporal and parietal bones, leaving a scar. He became insane, suffering from delusions of persecution. He was in fear of being hacked to pieces and of being poisoned; he was suspicious of everybody and everything, and to defend himself became extremely noisy violent, and made attempts at homicide.

J. T. ESKRIDGE ("Journal of Nervous and Mental Disease," 1889):

J. P., male, age thirty, Colorado ranchman, was left after typhoid fever with a purulent discharge from the right ear. During the following fortnight he was observed to be getting irritable, and one day was found in bed delirious, and with the delusion that his attendants were trying to kill him. His eyes followed the physicians and people in the room, as if suspicious of the actions of those by whom he was surrounded. He accused his attendants and Dr. Eskridge of seeking an opportunity to kill him, and cursed them accordingly in the unpolished language of a Western ranchman. The doctor received profane abuse for every question that he put to him. There was a sanious or semi-purulent discharge from the right ear, slight in amount but offensive in character. His appearance was depressed and anxious. His left arm and muscles of left angle of mouth were paretic. He was trephined and a large abscess cavity emptied; but the patient's improvement was only of short duration, and he died on the fifth day. Post mortem, there was found, besides this cavity, pus on the petrous portion of the right temporal bone with meningeal inflammation around.

JOHN KEAY ("Journal of Mental Science," 1894):

Patient, age fifty, was suffering from monomania of suspicion of about a year's duration. He had auditory hallucinations. Mentally he was an excitable, irritable monomaniac, full of delusions of suspicion. He charged people with hatching plots to do him injury, was extremely hot-tempered, and answered the most civil remark with a torrent of abuse and threats of civil action or physical violence. Thus he continued for four months, when his hitherto robust health declined, his appetite failed, and his weight diminished. It was then observed that he frequently placed his hand on the right temporal region, and at the same time it was noticed that there was a slight purulent discharge from the right ear, in which he seemed deaf. Patient resisted all personal examination. A month later he had fever and became semi-comatose. There was a swelling with tenderness on pressure over the mastoid

bone. It was agreed that the case was one of basal meningitis, arising from the purulent otitis media. The skull was trephined half an inch posterior to the external auditory meatus, and the pus allowed to discharge. Improvement seemed to follow the operation, but the patient died the following day. Post mortem, the convolutions of the temporo-sphenoidal lobe on the right side were softened. The walls of the ventricles were also soft, and they contained a quantity of semi-purulent fluid.

CHARLES W. BURR ("Journal of American Medical Association," 1907):

Case 15: A negro, age thirty, sustained a depressed fracture behind the left ear from a blow from a baseball bat, for which he was trephined on account of pressure symptoms. After the operation he became partially word-deaf and at the same time had auditory and visual hallucinations. He soon became unmanageable, and was violent and abusive. He had delusions of persecution. The brain showed distinct injury to the auditory speech centre.

TEMPORAL TUMOURS WITH DELUSIONS OF PERSECUTION

Tumour of Temporal Lobe found in a Murderer.

W. C. SULLIVAN, then Medical Officer, Holloway Prison, now one of H.M. Prison Commissioners ("Lancet," 1911):

Case of Dr. R. Cunyngham Brown, of H.M. Convict Prison, Parkhurst: "The patient, who was stated by the police to be a heavy drinker, murdered his wife; while awaiting trial he complained of visual and auditory hallucinations, and developed a persecutory delirium; after a period of remission the persecutory symptoms recurred with increasing mental confusion and apathy, and the patient died some seventeen months after the crime. At the post-mortem examination a large tumour was found infiltrating the right temporo-sphenoidal lobe." Dr. Sullivan continued: "So far as I am aware, this is the only case on record of actual homicide in this disease."

Numerous cases of temporal tumours with homicidal tendencies have been given in this and the previous chapter, and here are some more.

Other Cases of Temporal Tumours with Delusions of Persecution and Homicidal Tendencies.

F. J. MANN and J. O. STRACHAN, *State Hospitals' Bulletin*, 1891.
R. M. MARSHALL, *Journal of Mental Science*, 1909.
HARTMANN, *Archiv f. Psychiatrie*, 1884.
HENRI D. DAGONET, *Annales Médico-Psychologiques*, 1882.
H. SCHULE, *Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874.

INFLAMMATION OF TEMPORAL LOBE WITH DELUSIONS OF PERSECUTION

Examples of other Temporal Lesions with Delusions of Suspicion and Persecution.

TOMASCHEWSKY and SIMONOWITSCH ("Wjestnik Psichiatrii i Nevropatologii," 1888):

Patient, age thirty-three, always of good health, was frequently struck on the head by a drunken husband. She had subsequently several attacks of general convulsions which continued till her death. On admission, the principal symptoms were excitement, sleeplessness, delusions of persecution, and hallucinations of hearing. She heard with both ears the voices of her tormentors. There was chronic catarrh of the left Eustachian tube. Post mortem, there was thickening, adhesion, and injection of the dura over the gyri supra-marginalis and angularis and posterior half of first temporal convolution, and the brain substance of these parts appeared injected and wasted.

CH. VALLON ("L'Encéphale," 1881):

Patient, age thirty-five, had delusions of persecution. Four months later he had hæmatoma of right ear. He died a fortnight later of pneumonia. Post mortem, there were sanguinary effusions of both right and left temporal lobes in the posterior parts.

T. DUNCAN GREENLEES ("American Journal of Insanity," 1887):

James K., age fifty-three, had been insane for eighteen months previous to admission, consequent upon a paralytic seizure, the effects of which had partly disappeared. On admission he had a suspicious look, was very restless, and had the fixed delusion that persons wished to poison him. During his residence he was passionate, and became easily excited. If left to himself he was dull, and would speak to no one, preferring the solitude of his own company. Eighteen months after admission he had another paralytic seizure, accompanied by aphasia. Death nine days later. Post mortem, the whole of the left temporo-sphenoidal lobe was in a state of red softening, and broken down into a cavity. Part of the adjacent lower parietal lobe was also involved.

WM. JULIUS MICKLE ("Journal of Mental Science," 1883):

A soldier, age thirty-five, eighteen years' service, temperate and of good conduct. Ten years previously he was struck on the parietal bone, scar still visible. Six years later he became mentally changed: depressed, discontented, making silly and unfounded charges against those around him. He had absurd delusions of ill-treatment, of being starved, of having daily frightful corporeal injuries inflicted, of his life being threatened, and attempts being made to poison him. Right mastoid process was tender to the touch.

C. PRICE TANNER ("Brain," 1890):

T. R., age thirty-three, married, telegraph clerk. The history obtained from his wife was to the effect that he had always enjoyed good health, and had had no illness till twelve months before admission. At that time he suffered from "writers' cramp" and was low-spirited. After a holiday he recovered. A month prior to admission he was found with right hemiplegia, unconscious for four days. Paralysis improved, but his speech remained unintelligible. After a fortnight, when he got up from bed, his moral character was found changed. From being a fond father he seemed to take an aversion to his children, and was found by his wife more than once ill-using them. On one occasion he was holding one of them on the floor, kneeling over her with a knife in his hand. He became also very suspicious, and since his attack had slept with a hammer and knife by his bedside. He had also lately extra locks and bolts put on his doors. In consequence of his threatening behaviour to his wife and children it was found necessary to put him under restraint. He suffered from word-deafness and word-blindness. He died three months after admission. Post mortem, the whole of the left insula was found destroyed, apparently the result of hæmorrhage, and the hæmorrhage had invaded the superior part of the temporal lobe, extending right across to the inferior parietal lobule.

H. SCHULE ("Sectionsergebnisse bei Geisteskranken," Leipsic, 1874):

Hy., age thirty-nine, first suffered from indecision and irritability, later became bad-tempered and more irascible. He had several apoplectic strokes, which passed off, and after which his irascibility became permanent. In his paroxysms of excitement he expressed delusions of persecution, tried to run away, shut himself up in other people's rooms to escape from his persecutors, who were going to kill him. He offered active resistance to those who came near him. Emotionally he was in a depressed condition ever since the commencement of his illness. Patient died of pneumonia after four years' illness. Post mortem, dura was found adherent to the posterior portion of the temporal bone. The right temporal lobe was much atrophied, so was the left at the base. On section, a cavity three-quarters of an inch in diameter was found in the left temporal lobe. Large osteophites in the middle fossa. Right parietal eminence more prominent than the left, and containing also more brain substance.

Sir GEORGE H. SAVAGE ("Brain," 1878):

Sarah N. N., age thirty-five, aunt and cousin insane, father died of "brain softening." About five years prior to admission she had a love disappointment, and since then on several occasions she had short attacks of mental excitement, but these rapidly passed off. A few days before admission she became rather suddenly noisy and violent. Fancied people had knives concealed and meant to murder her. She said "her bed was an infernal machine," and that she was "surrounded by devils." She had wonderful visions, talked incoherently, and was very violent. She had hemiplegia a month after admission and died a week after of pneumonia.

Post mortem, it was found that the right temporal lobe was flat and bulging, and o incision an ounce of thick pus escaped, disclosing a thick-walled abscess occupyin the whole of this part of the brain. Rest of the brain apparently normal.

T. C. SHAW ("Archives of Medicine," New York, 1882):

M. R., age thirty-four, married, four children, had a sudden attack of los of consciousness, lasting two weeks, since when she was insane. The certificat committing her stated that she said some men were trying to kill her, and sh screamed without cause, and was at times violent. A month after admission sh had a severe epileptiform fit, after which she continued noisy, screaming un intelligibly night and day. Post mortem was found atrophy of superior temporo sphenoidal convolution extending to parietal lobe in both hemispheres.

CHARLES K. MILLS and WILLIAM G. SPILLER ("Journal of Nervous an Mental Disease," 1907):

Case of delusions of persecution, after fracture of the base of the skull—in whic was found post mortem contusion of the posterior part of the first and secon temporal convolutions.

Other Examples:

F. JOLLY, bullet wound. *Archiv f. Psychiatrie*, 1872.

R. v. KRAFFT-EBING, bullet wound. *Über die durch Gehirnersch. u. Kopfver hervorger. psych. Krankheiten*, 1868.

K. CRAMMER, *Archiv f. Psychiatrie*, vol. xxi.

L. SCHLAGER, *Zeitschr. Ges. d. Aerzte z. Wien*, vol. xiii.

LANDERER and LUTZ, two cases. *Christophsbad Asylum Report*, 1878.

P. DEECKE, *American Journal of Insanity*, 1883.

G. C. GABLETT, *ibidem*, 1877.

J. B. M. PARCHAPPE, *Traité de la Folie.*

D. M. B. BOURNEVILLE, *Archives de Neurologie*, 1880.

F. BAIZER, *Gazette Médicale de Paris*, 1884.

W. C. HOOD, *Journal of Psychological Medicine*, vol. xi.

EDWIN W. DAY, *Annals of Otology*, 1911.

W. FRÄNKEL, *Allg. Zeitschrift f. Psychiatrie*, 1869.

G. HEBOLD, *ibidem*, 1894.

HUNGER AND THIRST AND THEIR CEREBRAL ORIGIN

The most elementary instinctive impulse of animal nature is the impulse t satisfy hunger and thirst. The substrata of the appetite for food and drink are th stomachic branches of the vagus nerves and their cerebral centres; and as loc conditions of the stomach may destroy or increase the feeling of hunger and thirs so central disease may give rise to ravenous appetite, sitophobia, conditions e emplified in certain forms of insanity.

It is objected that hunger, or the desire for food, is referable exclusively to th state of the stomach. Facts, however, are against the objection. A certai condition of the stomach gives rise, no doubt, to the sensation of hunger, just as certain condition of the eye does to that of light; but the sensation itself take place in both instances in the brain. If we never experienced a desire to eat c drink except when the stomach required food or liquid, intemperance and diseas would play a much smaller part in the drama of life than they actually do. If th stomach were the sole seat of appetite we should never witness the apparen anomaly of excellent digestion existing without any desire for food, or great cravin without the power of digestion.

Hunger and thirst are commonly given in physiological text-books as marke and typical examples of "general sensibility." On the other hand, impulses t satisfy hunger and thirst have always been set down as instinctive. Now, the fee ings of hunger and thirst themselves prompt to the same sort of conduct as these s called instinctive impulses. Indeed, it seems possible that the same inner core

the psychic happenings, which in the one case is regarded as a visceral feeling, may be identical with that which, in the other, is named an instinct. What, then, should result if, instead of conceiving the inner core of the feelings of hunger and thirst to be the counterparts of certain visceral currents running to the brain, we were to turn squarely about and regard them as motor ideas seated congenitally in the brain, and let loose from it to prompt the creature to specific action for procuring sustenance ? Unquestionably our attitude of investigation of such matters would be revolutionised, and a wider horizon would be given to the problem. We should now expect these instincts to be aroused in more than one way—by smell, by sight, and even by sound, as well as by a condition of the stomach. Moreover, since in cases of instinctive impulses aroused through vision, for example, of an animal at sight of its prey, we should think it ridiculous to seek an explanation of these instincts wholly in the eye, so we should now be led, maybe, to recognise how faulty it has been for physiologists to seek an explanation of hunger and thirst wholly within the viscera. Of course, the mere taking of this wider view would not, of itself, solve all the mysteries of hunger, nor illumine beyond shadow all the realms of physiology, of insanity, and of emotion. But it would bring light into all these regions. It would enable us to understand how herbivora and other animals, whose stomachs are commonly more or less full, should yet feel hungry at the sight of food. It would enable us to imagine at least how hunger, proceeding from an empty stomach, may be explained in different ways, and yet in conformity with the conclusion that the viscera afford no direct sensory currents save of pain from pain-nerves and of muscle sense from muscular contractions. It may be that the mere emptiness of the stomach, or, again, the undue presence of its juices, incite muscular and peristaltic disturbances of such persistency or strength that they force their way to the cerebral centre, and thence arouse by association the proper instinctive feelings of hunger. Or in place of muscle sense, it may be that obscure and feeble pains are commonly the only direct visceral sensations, and these rising by pain nerves (sympathetic) to the cortical centre. Again, all these things may be brought into line with the fact that long-continued hunger may be lessened and apparently satisfied by the injection of food into the bowels. It is a small matter how hunger be explained—whether as visceral sensation or as instinctive motive—but the collateral issues are momentous.

In the instincts of hunger and thirst animals eat and drink before they can know that food and drink induce that pleasant external sensation which constitutes the satisfaction of the instinct. But if the animals become conscious of the objects of the instinct the volitional element is added, and the blind impulse of nature co-operates with the inclination of the animal to obtain it. The blind instinct is become the volitional instinct for food and drink.

In the pregnant, chlorotic, and hysterical female there is a desire for strange substances, and amongst the ordinary occupants of lunatic asylums we find sometimes morbid desires, longings, or impulses for various substances generally regarded with loathing and disgust. In the condition called **bulimia,** the patient has an irresistible longing for food of a normal kind, so that an exaggerated form of gluttony results. This may occur first when the stomach is enlarged, and, secondly, when it is of a normal size. Under either condition the person devours an enormous quantity at each meal—as much, indeed, as would suffice for three or four ordinary men, and yet he may be haggard and gaunt in the extreme. Amongst the insane bulimia is common—some, having devoured their own ample allowance, seize all they can lay hands on, prowling about the entire day in search of food. Another condition, called **dipsomania,** signifies a disordered cerebral condition, in which the individual madly drinks to excess, yet may loathe the degrading stimulant. On the other hand, the desire for food may be distinctly lowered in intensity or even lost. This is called **anorexia.**

Dr. HOPPE, of Copenhagen, was the first to observe a gustatory centre and centre for the alimentive instinct in the brain. In 1823 ("Edinburgh Phrenological Journal," vol. x.) he expressed the opinion that, besides the nerves of the stomach and palate, of which alone he conceived the sensations of hunger and thirst to be affections, there must be also a centre in the brain of animals for the instinct of nutrition for the preservation of life, which incites to the sensual enjoyments of the palate, and the activity of which is independent of hunger and thirst. In a second communication, in 1824, he gave the results of numerous observations, locating **the centre of taste at the anterior extremity of the temporal lobe.**

Dr. **CROOK,** of London, claimed that several years before the publication of Dr. Hoppe's papers, he himself had arrived at similar conclusions with regard to this propensity and the position of its centre.

FERRIER has located the gustatory centre at the anterior tip of the temporal lobe, in close relation to the olfactory centre. He says :

" It was noted in connection with electrical irritation of the lower extremity of the temporo-sphenoidal convolution in the monkey, and of the same region in the brain of the cat, that movements of the lips, tongue, cheek-pouches, and jaws were occasionally induced—phenomena which might be regarded as indications of the excitation of gustatory sensation. This interpretation receives support from the results of destructive lesions, and we have therefore reasonable ground for concluding that the gustatory centres are situated at the lower extremity of the temporo-sphenoidal lobes, in close relation with those of smell." (" The Functions of the Brain," London, 1876.)

Mr. **STEPHEN PAGET** read a paper some twenty years ago " On Cases of Voracious Hunger and Thirst from Injury or Disease of the Brain," published in the " Transactions of the Clinical Society " of London, 1897, in which he quoted some ten cases, the lesion being in all at the anterior extremity of the temporo-sphenoidal lobe.

Voracious appetite or bulimia, according to this theory, should be due to irritation of a certain part—the anterior tip—of the temporal lobe. If so, we should expect to see a manifestation of it in the two derangements we have already described as being due to lesions of the temporal lobe, namely (1) in acute mania, and (2) in epilepsy. This is actually the case. Of the former, several cases have already been quoted, and some more will be given ; and with reference to the latter, we may refer to Féré's paper on " La Faim-Valle Epileptique " (" Revue de Médecine," 1899).

Extraordinary Case of Voracious Appetite.

PERCY and LAURENT (" Dictionnaire des Sciences Médicales," article " Homophage ") cite the case of a Frenchman, named Tarrare, who when a lad would eat all sorts of odd substances to satisfy his ravenous hunger, with the result that he was frequently seized with colic. No sooner relieved than he resumed his previous practice. At the age of seventeen, when he weighed one hundred pounds, he would consume twenty-five pounds of beef daily. When in the army he would often devour his comrades' rations besides his own. When they guarded themselves, Tarrare was nearly famished, and had to go to the hospital. There they had to grant him a quadruple allowance, and yet he ate the refuse of the kitchen as well, and sometimes would swallow the poultices and anything else that came in his way. He was reported to have eaten dogs and cats, and once to have eaten the dinner of fifteen labourers. He was utilised by the officers of his regiment for comical adventures, but gradually the novelty wore off. He lived a little while on what food he could steal from poultry-yards and elsewhere, but in the end returned to the hospital. There he was discovered to have eaten the flesh of dead bodies, and when once the dead body of a little girl had mysteriously disappeared he was

suspected of it and dismissed from the hospital. He turned up again at the hospital of Versailles, where he died shortly afterwards of purulent diarrhœa, at the age of twenty-six.

Another Case of Voracious Appetite. ("Annales de la Médecine Physiologique," 1832):

A woman of the name of Denise furnished a curious example of insatiable appetite for food. In infancy she exhausted the milk of all her nurses, and ate four times more than other children of the same age. At school she devoured the bread of all the other scholars. And in the Salpêtrière Hospital it was found impossible to satisfy her habitual appetite with less than eight or ten pounds of bread daily. Nevertheless, she there experienced, two or three times a month, violent attacks of hunger, during which she devoured twenty-four pounds of bread. If, during her fits, any obstacle was opposed to the gratification of her imperious desire, she became so furious that she used to bite her clothes, and even her hands, and did not recover her reason till hunger was completely satisfied. On one occasion she drank the soup prepared for twenty persons and ate twelve pounds of bread. On another occasion she drank all the coffee prepared for seventy-five of her companions in the Salpêtrière. Post mortem, the anterior part of both temporal lobes were found abnormally developed.

Yet Another Case of Voracious Appetite.

J. B. F. DESCURET ("Lancet," 1836):

Patient, a woman, when at the Salpêtrière, ate the allowance of from fifteen to eighteen persons a day. When turned out of the hospital she seized every possible occasion for stealing bread and other food. At last she was compelled to retire into the country without resource, and there devoured every species of vegetable food which presented itself within her reach. But deprived of the faculty which herbivorous animals possess of distinguishing wholesome plants, she gorged injurious vegetable substances, and at last died from the effects of violent gastritis. The anterior tips of the temporo-sphenoidal lobes were found remarkably developed.

Voracious Appetite following Injury to Temporal Lobes ("Archives Générales de Médecine," 1860):

A man fell from a high scaffold, and was removed to hospital. He had a contused wound of the temple and hæmorrhage from the left ear. When he recovered consciousness after five days he was agitated, and constantly asked for food and drink. He drank daily from seven to twelve pints. He would call at the top of his voice for food and drink, and on one occasion he drank twenty-four and a half pints in one day. After some weeks his thirst slowly abated, and he left the hospital, in good health, eight weeks after admission.

Another Case of Injury with Intense Thirst.

BAUDIN ("Revue Générales de Médecine," 1860):

A young man, age eighteen, working in a saw-mill, was struck with a piece of wood on the right temple, and was unconscious for some hours; then came violent headache, fever, shivering, and intense thirst. Two days later he was well enough to go back to work, but his thirst persisted, and three weeks later he came to the hospital, begging to get relief from it. He was in good general health, his appetite for solid food was not excessive, he complained of nothing but extreme thirst, drinking all day, and waking at night again and again to drink. On one occasion in twenty-four hours he drank no less than fifty-two and a half pints. His urine was almost pure water, and did not contain any trace of sugar. He was treated with large doses of valerian, and in three weeks his thirst had much abated, and was daily getting less.

Other Cases of Injury.

PUTAWSKI ("Lancet," 1890):

A young man fell out of a waggon and struck his head against a stone. He was

admitted to hospital, unconscious, and bleeding from left ear. The diagnosis was fracture of petrous portion of temporal bone. On the fifth day he regained consciousness, and at the same time became inordinately hungry. The usual diet wholly failed to satisfy him. He constantly complained of hunger, and even cried for food. Six pounds of bread daily, besides other articles of diet, were not enough for him. The bowels acted regularly. There was no excessive thirst. After ten weeks his appetite fell to normal.

HERMANN NOTHNAGEL ("Virchow's Archiv," 1887):

A man, age thirty-three, in consequence of a kick by a horse, fell and came down with his right ear against a piece of wood. He was stunned, and unable to rise. Half an hour later he felt great thirst, and drank more than five pints in the next three hours, before admission to hospital. He was still suffering from thirst a fortnight after the accident, when he left the hospital at his own request. Within three hours of the accident he drank five pints of fluid, next day twenty-one and a half pints, the day after thirty-two and a half pints, the seventh day twenty-eight pints, on the eleventh day thirty and a half pints. A few days later, when he left hospital, his average had fallen to nine pints. There was no dryness of the mouth or throat, and the skin acted freely. The urine was clear, acid, free from sugar and albumen.

W. H. BENNETT ("Clinical Society Transactions," London, 1897):

A man, twenty-two years old, was struck with a hockey stick on the left temple, and was unconscious for about a quarter of an hour. About a month after the injury he began to have a voracious appetite for solid food. He would eat a whole chicken at one meal, and on one occasion ate twelve large slices of meat for lunch, besides vegetables, sweets, etc. He had no excess of thirst. This abnormal hunger lasted over a year, and the appetite had not yet quite become normal at the date of report.

Case of Temporal Abscess with Voracious Appetite.

STEPHEN PAGET ("Clinical Society's Transactions," London, 1897):

Case of a boy, twelve years old, with an abscess in the left temporo-sphenoidal region. The patient was twice trephined. Three days after the first operation the notes say: "His appetite is remarkable; he begs for solid food, and says, 'I want to go home; they don't give me enough to eat here.'" Two days later the notes say, "Restless and noisy, appetite ravenous." At this time he had partial aphasia. He slowly recovered. Even when he was at his worst—delirious, lying in a state of stupor, or screaming wildly—he would eat and drink greedily, taking more food than any man in the ward, asking for more, and saying, "What's the good of that to me?"

Case of Temporal Softening with Insatiable Thirst.

WERNICKE and FRIEDLANDER ("Fortschritte der Medizin," 1883):

Patient was deaf, had epileptic convulsions, and suffered with thirst so excessively that she drank water by the bucket. Post mortem, there was gummatous softening of both temporo-sphenoidal lobes.

Other Cases of Temporal Tumours with Voracious Appetite.

N. FRIEDREICH, *On Intra-Cranial Tumours*, 1853.
CRICHTON-BROWNE, *British Medical Journal*, 1873.
S. W. D. WILLIAMS, *Journal of Mental Science*, 1869.

Other Examples of Temporal Lesions with Voracious Appetite.

E. F. BRODIE, bullet wound. *American Practitioner*, 1880.
H. SCHÜLE, *Sectionsergebnisse bei Geisteskranken*, 1874.
R. v. KRAFFT-EBING, *Uber die durch Gehirnerschütterung und Kopfverl. hervorger. psych. Krankheiten*, 1868.
LANDERER and LUTZ, *Christophsbad Asylum Report*, 1878.
G. SPIES, *Zur Casuistik der Traumatischen Manie*, 1869.

ROSENTHAL, *Uber Magen Neurosen*, 1886.
MONRO, *Morbid Anatomy of the Stomach*, etc.
BLEYNIE, *Dissertation sur l'Inflammation du Cerveau.*
H. VOPPEL, two cases. *Allg. Zeitschrift für Psychiatrie*, vol. xiv.
C. P. JOHNSON, *American Journal of Insanity*, 1858.
MORTIMER, *Philosophical Transactions*, vol. xiii.
KENNETH M'LEOD, *Journal of Mental Science*, 1861.
W. J. MICKLE, *ibidem*, 1885.
B. B. FOX, *ibidem*, 1891.
F. LALLEMAND, *Récherches anat-path. sur l'Encéphale*, 1830.
J. P. FALRET, *Bulletins de la Société Anat. de Paris*, vol. xii.
Sir THOMAS SMITH, *Lancet*, 1879; and another case, *Clinical Society's Transactions*, 1897.
E. V. LEVINGE, *British Medical Journal*, 1878.
F. C. WALLIS, *ibidem*, 1897.
W. H. BENNETT, *Clinical Society's Transactions*, 1897.
W. S. COLEMAN, *ibidem*, 1897.
KINGSTON FOWLER, *ibidem*, 1897.

HOARDING PROPENSITY AND ITS CEREBRAL ORIGIN

Love of possession is a natural disposition implanted in the human organisation. In order to preserve existence certain animals and man store up things for future use. The desire to acquire property varies in strength in different people; and, like other propensities, it is liable to become morbidly exaggerated to cupidity, greed, miserliness, and kleptomania. The hoarding instinct in man has become greatly changed through the substitution of money, and can be seen only, in its primitive form, in those in whom the intellect is undeveloped—*i.e.*, in infants, idiots, and imbeciles, or where the intellect and the moral sense are in temporary abeyance, as in insanity.

The impulse to acquire and hoard—kleptomania—is of most frequent occurrence in the weak-minded, who steal without reflection and merely to satisfy their animal instinct. They will purloin whatever takes their fancy. Sometimes they display a considerable amount of ingenuity and low cunning in their methods of procedure. Acts of stealing occur also in the initiatory stages of general paralysis and sometimes in the later stages as well. The patients steal under the delusion that everything they see belongs to them. They appropriate all sorts of articles, hoard and conceal them, and immediately afterwards lose all recollection of them. Theft may also be the unconscious act of an epileptic. Cases of pure kleptomania, not complicated with any other disorder, occur more in private than in asylum practice, hence there are few cases officially recorded where a post-mortem examination has been undertaken to determine the seat of the lesion. According to the evidence about to be cited, the probable seat of the lesion seems to be the upper anterior part of the temporal lobe. But it has to be admitted that the evidence is so meagre, that the localisation must be considered highly problematical.

Morbid Love of Hoarding arising from an Injury to the Head.

CESARE LOMBROSO ("Archivio di Psichiatria," 1882):

The patient, age sixty-four, a rich citizen, was renowned for his sordid avarice. He was found to have an immense inclination to theft. He kept a set of burglary instruments, by means of which he robbed not only his servants, whom he frequently changed, but the guest whom he invited to his house and entertained there. The proceeds of his robberies he sold. This man fell, when a boy eight years of age, from a height on to a stove, and injured his left temple. He lost his left eye through the accident, and the temple bulged for ever afterwards. Lombroso held that this injury had caused changes in the brain which produced the morbid inclination. Here would have been a case for the surgeon.

A Medico-Legal Case.

ZIERL ("Friedreich's Blätter f. Gerichtl. Medizin," 1882):

L., age thirty-four, was wounded in the left temple in the war of 1870. The wound healed only after a year. There was a depression in the bone to which the superficial tissues were adherent, which became tender on pressure and in changes of weather. Patient, who was previously mentally sound and honest, had a delusion that everything he saw belonged to him. He had been sentenced eleven times before for appropriating other people's goods. On the twelfth occasion he was sent to the asylum for observation, where paroxysms of irascibility were noticed, which were accompanied by the delusion that everything he saw belonged to him. Acting on this delusion, he had kept other people's property, and hence the numerous committals for embezzlement. He was declared not guilty, as suffering from kleptomania.

A Case with a Post Mortem.

LUDWIG MEYER ("Archiv f. Psychiatrie," 1872):

Wilhelm H., a stonemason, age thirty-three, overworked himself, being anxious, as he said, to save some money for his children. One day, after a prolonged exposure to the sun's heat, he fainted and afterwards became irascible. Simultaneously he developed a delusion that he might starve, and to save himself he often asked excessive wages for his work, but inasmuch as the results of his work only deteriorated, he was discharged. He then went out thieving. For some days he stole loads of fish, at other times cartloads of wood. At the institution he loved playing at cards, but was only pleased when he could win. He died of an apoplectic stroke. Post mortem, a cyst was found in the anterior part of the left temporal lobe.

Head Injury leading to Kleptomania.

R. v. KRAFFT-EBING ("Über die durch Gehirnerschütterung und Kopfverletzung hervorgerufenen psychischen Krankheiten," 1868) gives a number of such cases, of which the following is an example:

C. D., age thirty-nine, labourer, single, hitherto healthy, who had fallen over a staircase and had knocked his head on the right temple so hard that he remained unconscious for some time. Apart from the local swelling, there were no signs or symptoms, and patient quickly recovered. Soon, however, he developed two morbid tendencies, for which he was sent to the asylum two years after—kleptomania and voraciousness. He could not distinguish what was his own and what was other people's property. He showed some maniacal excitement occasionally only; as a rule he was quiet. The kleptomania continued up to his death, four years after the accident.

WM. JULIUS MICKLE ("Journal of Mental Science," 1885):

J. W. T., age forty-seven, married, had sustained a very severe blow on the head from a stone nearly two years previous to admission. The place struck was in front and slightly above the left ear. Patient became subject to delusions about money, and would secrete trifling objects about the house and fill his pockets with coke. Post mortem was found decortication and adhesion of the left temporal lobe.

Other Examples:

KENNETH M'LEOD, two cases. *Journal of Mental Science*, 1861.
J. CHRISTIAN, *Archives de Neurologie*, 1880.
Sir THOMAS SMITH, *Lancet*, 1879.
E. KLEBS, *Vierteljahrschrift f. prakt. Heilkunde*, 1887.
WARREN L. BABCOCK, *State Hospitals' Bulletin*, 1896.
A. SPANBOCK, *Neurologisches Centralblatt*, 1895.
PAUL GUDER, *Geistesstörungen nach Kopfverl.*, 1896.
F. L. A. KELP, *Deutsches Archiv f. Klin. Medizin*, 1872.
CLOVIS GALLOPIN, *Annales Médico-Psychologiques*, 1879.

A. KOHLER, *Allg. Zeitschrift f. Psychiatrie*, 1877.
H. KURELLA, *ibidem*, 1895.

THE AFFECTIONS AND THEIR CEREBRAL ORIGIN

The mental functions of the occipital lobes are still unknown ; nor can we throw much light on them. But from anthropological and clinical observations it would seem that they are related to the gregarious instinct, *i.e.*, with the affections. A psychical symptom of the softening of the occipital convolutions that follows hæmorrhage is emotionalism, or loss of inhibitory power over muscles that express the affective states. Women, speaking generally, are (or used to be) more emotional and less intellectual than men. In harmony with this statement is the observation that women have more brain than men posterior to the great central fissure, and less anterior to it.

HERMANN WELCKER (1822-1897) found seventy-three per cent. of female skulls dolichocephalic (long-headed).

RICHTER ("Virchow's Archiv," vol. cxxviii.) and **BROCA** confirmed the results of Welcker. According to them, it would appear that the greater length of the female head, as compared with that of the male, is due to the additional occipital length.

D. J. CUNNINGHAM (1850-1909), according to Havelock Ellis, assigns to women a longer occipital lobe. Huschke found the same. Dr. **A. WEISBACH,** in his book "Der deutsche Weiberschädel," also certifies to the larger occiput of women as compared with men.

CESARE LOMBROSO (1835-1909) found in female criminals a short occiput, hence brachycephalic heads, and a complete absence of affection, though their libido sexualis is increased.

PAUL NÄCKE ("Archiv f. Psychiatrie," 1893), too, examined the brains of female criminals, and found that those committed for murder had a deficient occipital lobe. In the others—thieves, etc.—the occipital lobes were of normal size.

MORIZ BENEDIKT (1835-1920) has described the brains of three murderesses in whom the occipital lobes were short and did not cover the cerebellum.

DAVID FERRIER observed "that the only effect after extensive destruction of these lobes on both sides in a monkey was a remarkable state of depression with refusal of food." Sensation and voluntary motion were unaffected.

HERMANN MUNK says of a dog whose posterior lobes he destroyed : "The sight of men whom he used to greet joyfully now leaves him cold, and even the company of dogs with whom he used to play leaves him unmoved." Thus showing destruction of the gregarious instinct which gives social affection.

JACQUES LOEB found that after destruction of the most posterior part of the brain (occipital region) of a bitch, it lost its parental attachment and neglected its puppies directly after delivery.

Monkeys, of all animals, are the first to possess distinct occipital convolutions ; and they are considerably larger in the female than in the male, so that it is easy to distinguish the sexes by the appearance of their brains. The female monkey, too, shows as great, if not greater, attachment to its offspring than most animals, and orphan monkeys, according to Brehm, are always adopted and carefully guarded.

All that is positively known about the functions of the occipital lobes is that the calcarine region is related to the sense of sight. This relationship was known to EMIL HUSCHKE (1797-1858), who wrote :

"The posterior lobes are no doubt in ultimate relation with the emotional life and the sense of sight. No other sense organ has such an intimate connection with the tender feelings and grief as that of the nerve of sight, the fibres of which can be traced to the convolutions of the posterior lobes. Apart from the mimicry of

the eye, in which all affections are most vividly reflected, weeping is the best of all proofs."

With reference to clinical histories, there is this difficulty, that occipital lesions are very difficult to isolate. They involve nearly always the parietal or parieto-temporal convolutions. Nor has any attempt ever been made to differentiate the mental characteristics of occipital lesions. Therefore the cases about to be quoted are nothing more than very vague indications of possible functions of this part of the brain. Any serious inquiry would have to start without any preconception whatsoever.

EXAMPLES OF LESIONS OF OCCIPITAL LOBES

T. M. T. MacKENNA (*Journal of Nervous and Mental Disease*, 1908) :
Tumour—Jealousy, delusions of unfaithfulness.
WILLIAM BOYD (*Journal of Mental Science*, 1873) :
Tumour—Insane with jealousy.
T. S. CLOUSTON (*ibidem*, 1872) :
Tumour—Loss of affection for wife and family.
JANY (*Centralblatt f. Augenheilkunde*, 1882) :
Tumour—Excess of grief, weeping.
Sir DAVID FERRIER (*West Riding Lunatic Asylum Medical Reports*, 1874) :
Softening—Excessive cruelty to children.
W. CHARLES HOOD (*Journal of Physiol. Medicine*, vol. xi.) :
Serous infiltration—Infanticide.
ERNEST BISCHOFF (*Archiv f. Psychiatrie*, Berlin, 1899) :
Atrophy—Loss of recognition of children.
H. SCHÜLE (*Sectionsergebnisse bei Geisteskrankheiten*, 1874) :
Yellow infiltration—Insane grief at loss of child.
O. HOTZEN (*Vierteljahrschrift f. Ger. Medizin*) :
Arrested development, cerebellum uncovered—Matricide.
G. H. BERGMANN (*Zeitschrift f. Psychiatrie*, vol. iii.) :
Prominent occipital lobes, fully one inch projecting beyond cerebellum—Insane with thoughts of love.
The SAME AUTHOR (*ibidem*), a second identical case.
CESARE LOMBROSO (*The Criminal*) :
Osteophites in middle fossæ, arrested development of occipital lobes—Strocco, age sixteen, killed father, brother, and made an attempt to poison mother.
CHARLES PHELPS (*Traumatic Injuries*, 1898) :
Injury to occiput—Delusions of death of wife and child.
S. V. CLEVENGER (*Alienist and Neurologist*, 1888) :
Injury to occiput—Hallucinations of being with friends.

CHATELIN and de MARTEL (*op. cit.*) observe that "nothing is known of the functions of the external convolutions" of the occipital lobe ; only the visual area in the region of the calcarine fissure is admitted.

THE SEXUAL PROPENSITY AND ITS CEREBRAL ORIGIN

The sexual propensity has a spinal centre and a cerebral centre. As regards the situation of the former in the lumbar enlargement of the spinal cord all physiologists are agreed. As regards the latter, modern opinion is divided, some favouring the pineal gland, others the hypophysis cerebri. But according to the very latest observations, such bodily glands as the thyroid, thymus, and suprarenal appear to be involved.

The **pineal gland** (a structure at the base of the brain) seems to undergo some involution in adult life, the process apparently starting at about the seventh year ; but even in the aged it appears to perform some function, and not to be merely a

surviving remnant like the remains of the thymus. Clinical research has been devoted chiefly to *tumours* of this structure. Of these, approximately ten per cent. have exhibited symptoms of nutritional change, the most typical being precocity of the genital apparatus (but only in boys, not in girls) and also to some extent of the mental powers, and marked adiposity (RAYMOND and CLAUDE, "Bulletin de l'Académie de Médicine," 1910). The former is held to be associated with defect of the pineal secretion, the latter with excess of it, while total absence may give rise to a peculiar form of cachexia.

The **pituitary body,** or *hypophysis cerebri*, is considered the cerebral sexual centre by others. (See ARTHUR MUNZER, "Berliner Klinische Wochenschrift," 1911.) According to AXENFELD ("Neurologisches Centralblatt," 1903), tumours of the base of the brain, especially those which involve this structure, are most commonly productive of cessation of menstruation. Persons suffering from acromegaly, due to tumours of the hypophysis, are said to have complete amenorrhœa as one of its first symptoms. HARVEY CUSHING, of John Hopkins University ("Journal of Nervous and Mental Disease," 1906), called attention to cases in which tumours affecting the hypophysis were complicated not only by optic atrophy, but also by sexual infantilism, this latter condition involving complete absence of menstruation.

There seems to be some antagonism between the pineal and the pituitary bodies, as removal of the testicles is said to lead to atrophy of the pineal and to hypertrophy of the pituitary.

In the opinion of others, not only pituitary insufficiency, but also insufficiency of the **thyroid** secretion may cause the genital organs to remain infantile, and disease of these structures may cause retrogression in the genitalia even after they have functioned normally. Removal of the thyroid is said to produce an intense degree of atrophy in the uterus. The ovaries, however, do not retrogress; on the contrary, there appears to be increased activity.

The **thymus** gland is also mentioned in connection with this function, removal of the ovaries leading to its hypertrophy.

According to the most recent investigation, yet another bodily structure appears to be involved. It is claimed that **suprarenal** tumours in *male* children are practically always associated with precocity of the sexual organs and secondary sexual characteristics; whereas the sequence in *female* children is not precocity of the sexual organs, but a tendency to produce the characteristics of the male in the sexual organs, together with a deep voice.

The evidence in favour of these structures, cerebral and bodily, is, however, poor compared with the evidence which Gall produced for his cerebellum theory, and which has greatly increased in the course of a century. But, it will be said at once, "Surely you do not intend to revive that long-discredited theory of Gall? Scientific opinion is absolutely agreed that it is utter nonsense." I am fully aware that the mind of physiologists and neurologists is made up on this question. They have given their verdict. But I am also aware, by the abuse that is heaped upon Gall, that his evidence has never been read, and that no attention has been paid to the extraordinary number of clinical cases which favour his theory, and these I propose to quote for whatever they are worth. For the present I would ask the scientific expert to be indulgent, and let me restate the whole problem, not with a view to prove Gall's conception of it, but to enable future investigators to *discover* what is the cerebral seat of this fundamental propensity.

Before doing so, let me remind the expert that the thyroid secretion has a marked influence on the intellectual and emotional manifestations; yet he would not dream of locating these in the thyroid gland. Similarly the structures mentioned may influence the sexual organs, and yet not be the seat of the sexual propensity.

At the outset, it has to be remembered that Gall was the first to describe the structure of the cerebellum, so that there can be no question of his qualification as an anatomist.

Next, it has to be pointed out that all investigators have proceeded on the false assumption that Gall located in the cerebellum the sexual potency; but he did nothing of the kind. Gall did not say that every vital function concerned in propagation depends immediately upon the cerebellum, but that the *idea* or *feeling* which prompts to the generative act is organically dependent upon it. He located only the sentiment which involves consciousness in the cerebellum. The second factor in the process, the reflex action, must take place through the agency of the appropriate segment of the spinal cord, namely the lumbar enlargement. And the last factor in the process—the secernment—may occur through the sexual organs. Therefore, to do Gall justice, we must observe whether changes in the thymus, thyroid, pineal, pituitary, or suprarenal glands affect the libido, *i.e.*, the psychical sexual condition.

Gall located only the *libido sexualis* in the cerebellum, not the *potentia coeundi*; and he did not locate the libido in the central portion of the cerebellum, but in the *lateral lobes*, of the functions of which—to this day—we know nothing. The lateral lobes of the cerebellum are situated in the occipital fossæ, externally visible in an arch between the occipital protuberance and the mastoid processes behind the ears. The greater the size of the cerebellum, the deeper the fossæ, and the more prominent these arches, the larger the surface for attachment of the muscles, making the nape of the neck rounded, large and thick. When the lateral lobes are small, the distance between the two mastoid processes is narrow; the ears lie close together, and the nape of the neck is flat and depressed.

But, of course, the size of the cerebellum must be calculated in relation to the size of the entire brain. Taken in such relation, the cerebellum in infants up to the age of puberty is small. In the human race the cerebellum is a sixteenth to a twenty-fifth part of the whole brain at birth; but after puberty the ratio between cerebellum and cerebrum is as 1 : 6 or 1 : 7. Gall thought this was due to the development of the sexual passion, and I am not aware that any other explanation has ever been offered.

Both **MEYNERT** and **NOTHNAGEL** ("Centralblatt f. Nervenheilkunde," 1878) have observed that the cerebellum increases in size accordingly as one ascends the scale of life; and even when the cerebrum has reached its absolutely highest weight, the cerebellum continues to grow, and represents most definitely the scale of rising and declining manhood. Why is this?

According to Gall, the cerebellum is relatively largest in man, whose sexual activity is not, as in the case of animals, confined to the heat periods. He claimed to have observed that castration in early infancy prevents its full development; and that frequently the cerebellum is of excessive size in offenders against morality, and there is turgescence or disease in persons suffering from satyriasis or nymphomania. He even went so far as to assert that removal of one testicle not infrequently diminishes the size of the cerebellar lobe on the opposite side.

REICHARDT ("Allg. Zeitschrift f. Psychiatrie," 1906) declares this latter statement as "undebatable nonsense." He bases this very strong opinion on three cases he had observed. The first was that of *a general paralytic, seventy years old*, who had one testicle crushed by a waggon that went over it; the second, a man, fifty-seven years of age, also lost a testicle through an accident; and the third was a *cretin*, thirty years of age. Surely, these are not suitable cases for an investigation, neglecting the most primary precaution that the subject should not suffer from any other disease.

Gall further showed that when the cerebellum is inordinately developed at an early period there is precocious manifestation. He gave other cases to show the effect of emasculation on male children. If mutilated in infancy, there is no desire; if mutilated after puberty, or at that period, the desire remains, but is feeble.

Gall performed numerous dissections and experiments on animals, the results of which supported his theory. I must leave it to the expert to examine this mass of evidence. Here I can mention only a few facts. He observed an increased turgescence of the cerebellum in animals killed at the moment of heat as compared to the cerebellum of animals destroyed in another season. The emasculation of the males of our domestic quadrupeds at an *early* period of life is stated to prevent the development of the cerebellum. Hence the smallness of the neck of the castrated horse, ox, sheep, and hog compared to that of the uncastrated one. And those that are castrated soon after birth have no sexual propensity. But in those castrated after maturity some share of the propensity remains, although the power of performance is taken away. And in these the cerebellum is diminished in size after castration, but never becomes so small as it would have been had they been castrated at an early period. Emasculation affects materially no other portion of the brain but the cerebellum.

The effects of early and late castration on the potency of men were known to the ancients. For this reason Roman women deferred the period of castration until their slaves had passed the age of puberty, and were thus able to satisfy their passions without danger. "*Sunt quas eunuchi imbelles, ac mollia semper oscula delectant, et desperatio barbæ, et quod abortivo non opus est,*" etc.—Juvenal, Sat. vi.

Gall and his followers furnished a number of pathological observations of lesions of the cerebellum, especially of injuries, and showed that when the cerebellum is concussed or atrophies, the libido is extinguished; when the injury inflames the cerebellum, the libido is rendered more intense. Still, it must be admitted that Gall made most of his observations on the living subject, judging the size of the cerebellum by the size of the nape of the neck. Therefore, **even if Gall was correct in his observation, he may have been wrong in his inference.** A large nape of the neck may mean a large occiput, but it does not necessarily mean a large cerebellum. The nape of the neck may be large in consequence of the development of the undersurface of the occipital lobes, and only in a minor degree, if at all, indicate the size of the cerebellum.

That a large nape of the neck indicates an active sexual propensity can be verified by observations both on men and animals. I believe agriculturists are well aware of it. In this connection I may relate the visit of the celebrated Dr. **FÉLIX VOISIN** to Toulon Prison to study the heads of men confined for crimes on women. He was expected to select them out of 372 prisoners of all sorts. He chose 22 individuals, and did not look at the rest. Thirteen of these had actually been condemned for rape; the other nine were committed for other crimes, but were under special surveillance for sexual prochivities. ("De l'Homme Animal," Paris, 1839.)

In the course of my medical practice, a number of children have been brought before me, both boys and girls, some as young as four years of age, manifesting sexual precocity. In all of them I have found a very large occiput, ordinary in length, *i.e.*, not elongated, but extraordinary in width at the nape of the neck from ear to ear. I have observed the same formation in adults for whom the opposite sex had an excessive attraction, amounting in some to a mental obsession. This peculiarity is particularly noticeable in old men who have not given up courting. Maybe that this observation, which can be easily verified, is of no more than physiognomical significance; but I mention it as confirming Gall's view.

HENRY HEAD ("Brain," 1894) finds that the pain and tenderness in diseases of the ovaries or testes is referred to the occiput.

The nape of the neck covers the cervical vertebræ, and it is a common observation that injury to these may cause priapism. **MARSHALL HALL** ("Lancet," 1838) wrote: "I have never met with any case in which priapism took place, except when the cervical spine was the seat of injury. Whenever the cervical vertebræ have been injured priapism has almost invariably occurred immediately after the injury." This is known to those who have observed "hanging by the neck."

T. SYMES PRIDEAUX wrote: "The convexity of the lower fossæ of the occipital bone and their protrusion backwards and downwards really have a connection with the strength of the sexual feeling; but then these conditions are principally due to the development of the under surface of the posterior lobe of the cerebrum, and but in a minor degree to the size of the cerebellum."

That the ancients observed the size of the nape of the neck appears from their nuptial ceremonial. It was customary to measure the neck of the virgin previous to the wedding, and again on the following day, and if it had increased it was a sign that marital relations had taken place. This curious test, which has also been utilised to establish the fact of adultery, has been transmitted to us in the *Epithalamium* of CATULLUS:

> "*Non illam nutrix orienti, luce revisens,*
> *Hesterno collum potuit circumdare filo.*"

Apollonius of Rhodes, speaking of the passionate love of Medea, says: "The fire which devours her attacks all her nerves and makes itself felt behind the head in that spot where pain is most poignant when an extreme fervour seizes all the senses." Of olden time, artists depicted broad necks for sensual people.

Since Gall's time numerous experiments have been performed on animals, all apparently disproving his theory, and their authors vie with each other in heaping contumely on poor Gall, that "idiot," in the opinion of **KONRAD RIEGER.** Still I ask the expert to read these pages patiently to the finish. If his mind is not already made up, he may learn something that may prove of advantage to him in attempting to solve the problem. Remembering Flourens' experiments, which delayed the recognition of the localisation theory for half a century, would it not be wise to reserve judgment until we have a larger store of facts from which to draw our deductions?

From the history of the numerous investigations into the functions of the cerebellum which are about to be given, it will be seen that most authors are agreed that this structure is the centre of co-ordination and preservation of the equilibrium of the body. This does not, of course, exclude the possibility of its being the centre of the libido as well. But regarded purely as a regulator for movement, why does it develop so late in children? Co-ordination and equilibrium are established before puberty. Why does the cerebellum bear no relation to the locomotor capacities of animals? Why is manual dexterity not affected by a lesion of the cerebellum?

It will be seen that some physiologists are against Gall's theory, because faradisation of the cerebellum failed to excite the sexual organs. But Gall did not locate the potentia there, but merely the desire. We might as well expect that faradisation of the left third frontal convolution—the speech centre—should make a man talk. We do not excite the stomach by exciting the gustatory centre.

The great majority of the physiologists are sure of the utter worthlessness of Gall's view because destruction of the cerebellum not only keeps the sexual instinct intact, but seems to excite it. Now, destruction, especially by slow ablation, is bound to act as an irritant, and, secondly, the destruction is probably hardly ever

complete, for as RISIEN RUSSELL ("Philosophical Transactions," 1894) has pointed out, as the result of his experimental researches into the functions of the cerebellum, the destruction of the entire organ is a surgical interference of such magnitude that nearly all the animals experimented on succumb to the immediate consequences of the operation. Even were sexual potency—and not the libido—located in the cerebellum, it would be no more surprising that destruction of this organ shows no loss of the particular function, than that movements are preserved after the entire cerebral motor area has been removed.

Gall's follower, **BOUILLAUD** (1796-1881), "Archives Générales de Médecine" (1827), did not accept the localisation. He thought the sexual instinct was located in the medulla.

THOMAS WILLIS (1622-1675) held the cerebellum to be the source of all *involuntary* movements, especially of respiration, heart, and bowels.

LUIGI ROLANDO (1773-1831), as a result of his experiments, regarded the cerebellum as the central source of all *voluntary* movements.

F. MAGENDIE (1783-1855), "Lectures on the Physiology of the Nervous System," noticed the extreme difficulty of making a conclusive experiment on the cerebellum, and thought it the seat of a propensity to move "forwards," opposed by a propensity to move "backwards," with its seat in the corpora striata. Still, he acknowledged that he was struck to find so many cases of high irritation of the genital apparatus coinciding with atrophy or more or less destruction of the cerebellum.

JULIUS BUDGE ("Researches of the Nervous System," Frankfort, 1841), **VALENTIN, HAMMOND**, and **SPIEGELBERG** saw in the cerebellum an apparatus for the inhibition of motion, and observed after stimulation *movements of the uterus and testicles.*

J. P. FLOURENS (1794-1867) stated that on removing the first layers of the cerebellum in the pigeon or guinea-pig, for instance, weakness and hesitation in walking were produced. When the middle layers were cut out, the animal staggered much, but heard and saw perfectly, and did not express pain. When the whole cerebellum was removed, an inability to fly, walk, or run took place, and the animal lay down; whence he inferred that the cerebellum is the organ by which all the locomotive actions are regulated.

F. LEURET (1797-1851), "Anatomie Comparée du Système Nerveux," 1839, made many investigations to disprove Gall's theory, that castration before puberty causes arrest of development of the cerebellum. He weighed the organ, whereas Gall measured its size. Now, it is quite possible that the size of a cerebral organ may diminish without its weight diminishing, the size may even diminish and the weight increase, as in sclerosis. Leuret thus found the cerebellum in castrated horses rather heavier in weight than normal ones. On the other hand, HUSCHKE ("Schädel, Hirn u. Seele," Jena, 1854) contradicts Leuret, and says that castration in animals has very detrimental effects on the occipital brain (cerebellum, pons, and medulla), which assumes infantile appearance.

Sir **DAVID FERRIER** ("The Functions of the Brain," London, 1876) considers the cerebellum an organ of "equilibration." He thinks that after destruction of the cerebellum the animal has still sexual desires, but fails to execute them on account of its defective control over its limbs, so that it must be put in the necessary position. Nor will the animal seek gratification voluntarily. Still, Ferrier does not seem opposed to Gall's view, for he says ("Functions of the Brain," p. 432): "As morbid irritation of the sexual organs may excite a morbid sexual appetite, so, conversely, the sexual appetite may be morbidly excited by pathological irritation of the cerebral paths and the cerebral centres of the sensations connected with the exercise of the generative functions. To the former belong the satyriasis or nymphomania occasionally observed in connection with disease of the middle lobe of the cerebellum; to the latter the various morbid exhibitions of the sexual appetite in insanity where the centres are functionally or organically diseased." On p. 123 he explains, however, that "disease of the median lobe of the cerebellum has been found to co-exist with priapism, or excitement of the generative organs," but that

"such a condition of things is eminently calculated to cause irritation of the subjacent posterior surface of the medulla oblongata and pons."

Sir **VICTOR HORSLEY** (1857-1916) has shown by his experiments that, unless the cerebellum is intact, running, walking, and even standing, are impossible. The automatic function of standing involves extension, of which the newly-born of most mammals are incapable. But standing does not depend entirely on the cerebellum. There are other centres concerned in this. The cerebellum is not even the centre for equilibration. This is in the labyrinth and semi-circular canals of the ear. The tendency in cerebellar disease to incline the head to the side of the lesion is, I believe, due to lesions of the labyrinth. It is the middle portion of the cerebellum —the vermis—only which is connected with disturbances of movement; the functions of the lateral lobes are still unknown.

According to **W. WUNDT** (1832-1920), "the cerebellum appears to be intended for the direct regulation of voluntary movements by sense impressions. . . . If this hypothesis be correct, it will, accordingly, be the central organ in which the bodily movements incited from the cerebrum are brought into harmony with the position of the animal body in space."

F. L. GOLTZ (1834-1902) destroyed the middle lobe of the cerebellum, and found the sexual functions still intact. This is quite natural, for lesions of the middle lobe were known to Gall to cause inco-ordination of movement. Goltz did not destroy the lateral lobes, and his experiment diminishes in value in the face of another which he performed, dividing the spinal cord in the lumbar region opposite the first lumbar vertebra, when the function, as he says, was also still preserved. This agrees with the observation of W. B. CARPENTER (1813-1885), who performed the same experiment of section of the lumbar cord. Clinical observation, however, has shown opposite results. In transverse lesions of the lumbar region of the cord, impotency is common.

LUIGI LUCIANI (1842-1919), "Il Cerveletto," extirpated one half of the cerebellum in bitches. The animals manifested "heat" at the usual period, though the act could not be effected owing to motor instability. Why should they not manifest heat if the lumbar centres were intact? He also deprived a dog of the entire cerebellum, and the mutilated male and female animals exhibited such sexual eagerness "that my laboratory seemed to be transformed into a lying-in hospital." The possibility that the mutilation set up inflammation, which acted as an irritant, occurred to Luciani, only that he thinks that owing to destruction of the cerebellum "some inhibitory factor had dropped out, causing an abandonment to fleshly lusts." This agrees with CARL OTTO (1795-1879), who regarded the cerebellum as an inhibitory apparatus for the sexual instinct. ("Centralblatt f. Nervenheilkunde," 1877.)

According to Luciani, after cerebellar lesions, the movements lack their normal energy, the tonus of the muscles is lowered, and the movements are uncertain and incoherent. He is inclined to regard the cerebellum as primarily an apparatus for the production of nervous force, an "auxiliary" or "intensificatory system" for the whole cerebro-spinal organ, which is not the seat of any specific or peculiar functions, but reinforces the functional activity of the entire nervous system. In support of this view, he adduces the trophic disturbances that appear, in course of time, more especially after complete extirpation of the cerebellum.

PH. LUSSANA (1820-1898), "Fisiologia a Patologia del Cerveletto," Verona-Padua, 1885, thought the observations of cerebellar lesions have not been conducted with sufficient care, and cited thirty-five cases with affection of sexual "sensation" (senso specifico venereo). The sexual propensity (instincto venerio) which gives the impulse to seek connection he located in the cerebrum. The abuse of the sexual instinct he believed to produce a particular form of vertig. ataxy. It has an effect on the co-ordination of movement. The effect of over-indulgence must be studied pathologically and cannot be determined by experiment.

As is well known, in the initial stages of locomotor ataxia there is frequently a hyperactivity of the sexual instinct, which afterwards becomes extinguished. We might therefore expect, in addition to the spinal lesion, changes in the cerebellum. These morbid changes in the cerebellum of ataxic patients have been described by **ERNST JENDRASSIK** ("Deutsches Archiv f. Klinische Medizin," 1888). He

gives illustrations of the atrophy of the cells. Anæsthesia and analgesia of the genitals was found by Fournier, G. E. Rivière (Bordeaux), Émile Bitôt and Jean Sarrazés ("Revue de Médecine," 1891), and Marinesco ("La Semaine Médicale," 1897).

It is also known that sexual excess is a common symptom in the early stages of general paralysis (Voisin drew attention to the fact), and **J. LUYS** ("Récherches sur le Système Nerveux Cérebro-Spinal") states that in all the autopsies of cases of general paralysis which he had made he had found the grey substance of the cerebellum to be diseased in a more advanced degree than the cerebral convolutions. ADOLF MEYER ("Archiv f. Psychiatrie," 1889) showed atrophy of the cerebellum in general paralysis, in the form of a sclerosis.

JELLINEK described the microscopical appearances of atrophy of the cerebellum in Tabes Dorsalis.

WILLIAM P. KROHN ("Journal of Nervous and Mental Disease," 1892) observed sexual incompetency and ataxy in a cat whose cerebellum was subsequently found uniformly atrophied. A minute histological description was given.

F. A. LONGET (1811-1871), "Anatomie et Physiologie," vol. i, and HEUSINGER found hæmorrhage in the cerebellum with swollen, inflamed testicles.

F. COURMOUL ("Le Cervelet et ses Fonctions," Paris, 1891) regarded the cerebellum as a psychic and sensitive organ.

ANDRÉ THOMAS ("Le Cervelet," Paris, 1897) regarded it as an organ of sensation. The sensation of the generative organs is lost in lesions of the cerebellum.

Sir **JAMES CRICHTON-BROWNE** ("West Riding Lunatic Asylum Medical Reports," vol. ii.) said:

"The exact functions of so large and important an organ as the cerebellum are still undecided, but most authorities incline to the belief that it is in some way connected with the genital system, and is the seat either as a whole or in part of the sexual instinct or of the sexual sensation. When so accomplished a physiologist as Dr. Carpenter, who will certainly not be suspected of any phrenological bias, is found supporting the latter view, and when Brown-Séquard is found corroborating it, and attributing to irritation of the cerebellum an exaggeration of the sexual desires, there can be little hesitation in accepting it as true in the main, but as subject to qualification hereafter in accordance with the increased accuracy of our knowledge of the nervous centres. The effects of injuries in the region of the cerebellum are strongly confirmatory of the opinion that it is in intimate relation with the sexual appetite and apparatus."

CESARE LOMBROSO (1835-1909), in his work, "The Female Offender," said that "female criminals who have a large cerebellar development have no chastity."

ENRICO ROSSI ("Il Manicomio Moderno," 1891) opposed Longet's and Luciani's views and regarded the cerebellum as the organ of the sexual instinct.

HENRY POWER ("Human Physiology," London, 1881) and **AUSTIN FLINT** ("The Physiology of Man," New York, 1873), also support the cerebellar theory. The former quotes Brown-Séquard and also Carpenter, who published seven clinical cases of cerebellar lesions in sexual cases.

R. JAMESON ("Journal of Mental Science," vol. xxii.) located the amative propensity in the cerebellum and considered deficiency in its size a cause of anaphrodisia.

CHATELIN and **de MARTEL** (*op. cit.*) say with reference to the cerebellum that "it would be of little use to recount in detail the complicated history of the *almost useless experiments on animals* carried out in former days." They rely on BARANY'S clinical researches, which appear to prove in the cerebellar cortex (four) *centres of muscular tonicity*, which furnish the groups of muscles of the various joints and maintain their attitude in repose by balancing the antagonistic muscles.

I shall now produce an extraordinary number of clinical cases—extraordinary in view of the fact that the sexual function is so seldom inquired into in cases of cerebral lesions, and that the cerebellum is so seldom examined at autopsies. All we know of the functions of the cerebellum is that the central portion has to do with inco-ordination (cerebellar ataxy), and that extensive and even gross destruction of the lateral lobes may take place without producing any obvious symptom. We have

shown that physiologists ascribe to the cerebellum no mental function whatsoever, and that they consider as exploded the antiquated theory of its relation to libido sexualis. But that there is, in addition to the subsidiary lumbar centre, such a centre somewhere in the brain—and probably adjoined to the cerebellum, if not in the cerebellum itself—can no longer be doubted. For this reason I have reproduced the clinical histories which favour this theory, and we may hope that some investigator may sooner or later discover the actual localisation of this—one of the most primary propensities. I need only add that, with the exception of Gall's contemporaries, the authors mentioned in the succeeding pages had no theory to sustain. They faithfully reported the cases they had witnessed.

The cerebellum receives little or no attention in normal people. Almost all the cases of arrested development which have been recorded have been observed in idiots and imbeciles. Not only is there arrested development of the cerebellum, but the genital organs are also frequently undeveloped. **FÉLIX VOISIN** (1794-1872) noticed this in 150 idiots and imbecile girls at the Salpêtrière ; and **BOURNEVILLE** and **SOLLIER** ("Le Progrès Médicale," 1888) found 55·4 per cent. of idiots under thirteen years of age with anomalies of the sexual organs.

GALL, as already mentioned, cited numerous clinical examples.

Baron **LARREY** (1766-1842), Napoleon's military surgeon-in-chief, in his book on "Observations on Wounds," quoted quite a number of cases of his own experience.

E. R. A. SERRES (1787-1868), "Journal de Physiologie," Paris, 1822, who was physician to the Hôpital de la Pitié at Paris, and whose hostility to Gall is scarcely less known than his anatomical researches, claimed to have found undeniable evidence of the sexual functions of the cerebellum. He published a number of cases of cerebellar apoplexy which had come under his notice, and which all occurred in persons while they had abandoned themselves to venereal excesses, and in all of them he found an inflamed state of the cerebellum. Why is there no surgeon at the present day who will test the validity of this evidence ? We read now and then of such cases, but never that the cerebellum has been examined. The fact is, men only look where they expect to see something ; and since "their mind is made up" that there can be no cerebellar lesion, they do not look for it. But, even if they merely disproved Gall's theory, their evidence would be of value.

G. ANDRAL (1797-1876) and **P. S. SÉGALAS** (1792-1875) cited a number of examples.

COMBETTE ("Revue Médicale," 1831, also quoted in Longet's "Anatomie et Physiologie du Système Nerveux," 1842) published the well-known case of the girl Alexandrine Labrosse, addicted to perversion from infancy, who was found, on post-mortem examination, to have no cerebellum, owing to atrophy. She could co-ordinate all the limbs voluntarily, and had the full use of all the senses. She was, however, subject to falling, and spoke imperfectly.

Sir **ALEXANDER MORISON** (1779-1866), in his "Lectures on Insanity" (1848), published several cases, of which the following is an example :

Robert S., imprisoned in Horsemonger Lane Gaol for attempting to gratify his unnatural propensities, which he indulged in from his early youth and for which he had been sentenced on three previous occasions, was found, post mortem, to have a large ulcer in the cerebellum.

C. F. BURDACH (1776-1847), the celebrated physiologist, produced also in his book, "Vom Bau und Leben des Gehirns," quite a number of such cases.

JOHN EPPS (1805-1869), "Lancet," 1828, brought before the Westminster Medical Society two cases, one of nymphomania, one of satyriasis, both suffering from extensive disease of the cerebellum.

WM. A. HAMMOND (1828-1900), "Quarterly Journal of Psychological Medicine," vol. iii., published three cases.

W. B. CARPENTER (1813-1885), in his "Human Physiology" (1881), as already mentioned, published seven cases.

A. OTTO ("Centralblatt f. Nervenheilkunde," 1877) produced four cases.

PH. LUSSANA (1820-1898), in his "Fisiologia e Patologia del Cerveletto" (1885), published not less than thirty-five cases.

MORIZ BENEDIKT ("Archives de l'Anthropologie Criminelle," 1891) performed the post mortem on Hugo Schenk, whose trial at the time caused a great sensation in Vienna. He formed an extraordinary number of liaisons with servant-girls, and when he grew tired of them, which was usually very soon, he murdered them. He was handsome, very intelligent, and an excellent talker. His sexual vigour was extraordinary, and, being of a lazy disposition, he exercised it for a living. He was executed at the age of thirty-six. Post mortem it was found that his cerebellum was of extraordinary weight, namely 194 grammes, *i.e.*, over twenty-five per cent. above the normal.

GIUSEPPE MAINARDI ("Allg. Zeitschrift f. Psychiatrie," 1873) observed a similar case of a satyriacal maniac and wholesale murderer—Giovanni Grassi—in whom he found, post mortem, inflammatory lesion of the cerebellum.

I could go on giving a hundred more such cases with their unwholesome details, but this being a general and not exclusively a medical work, I shall give merely a classification and the necessary references, for the investigation by experts who wish to take up this problem.

The following is the report of a case of cerebellar tumour which was sent to me from a North Country institution, with the request that, "if the notes forwarded to you are published, would you be good enough to suppress any reference to this asylum?"

T. N., age forty-seven, married, was admitted to the asylum, with all the physical signs of general paralysis except the speech, which was clear, with delusions of great wealth, but otherwise clear intellect until his death six months later. The following history was supplied by the wife to the medical superintendent: "She had been married to the patient nineteen years. She had one child; no miscarriages. He had connection two or three times a week throughout their married life, yet he went with other women, and used to masturbate, having previously made 'soap women,' which he put on the bed. He had a good tenor voice, drank freely, was not specially extravagant, and when sober was a hard-working man. Three weeks before admission the first signs of illness developed." The following notes were made at the autopsy. "*The cerebrum was normal.* The membranes stripped readily, and the arachnoid showed no opacity. Weight of encephalon 1345 grammes; of Pons Varolii, 20 grammes, medulla 9 grammes, and cerebellum 150 grammes. In connection with the cerebellum, there was a small growth of about the size of a filbert; it was of a whitish colour and consisted of numerous small nodules, somewhat resembling small sago grains; it sprang from the membranes, and was removed easily and without in any way damaging the cerebellar cortex. It was situated on the under surface of the cerebellum, and could not be well seen until the medulla was removed. It arose from the membranes in the slight recess situated between the uvula and amygdala of the right side, and pressed on and slightly indented the right lobe of the cerebellum, and the uvula was pushed slightly to the left. There was no sign of any vascular disturbance around, and beyond the fact that some portion of the cerebellum was apparently pushed slightly out of position, there was no other change visible. The post mortem otherwise showed only some slight renal cirrhosis." The writer adds: "We have no pathological laboratory at the asylum, that is why the growth was not examined microscopically."

Examples of **PRIAPISM in Cerebellar TUMOURS,** producing congestion:

N. FRIEDREICH, *Intracranial Tumours*, 1853.
PERSILLE, *Oppenheim's Zeitschrift*, 1849.
JOHN ELLIOTSON, two cases. *Lancet*, 1837.
RIFFORTZ, *Journal f. Chirurgie*, vol. xxiii.
K. F. H. IMMERMANN, *Berliner Klinische Wochenschrift*, 1865.
PÉGOT, *Archives Gén. de Médecine*, 1834.
G. ANDRAL, *ibidem.*
MIGNOT, *Gazette Hebdomadaire*, 1875.

E. R. A. SERRES, *Journal de Physiologie Expérimentale*, 1828.
Also Mance, Dubois, Falret, Dunglison (mentioned by Burdach), etc.

Examples of **PRIAPISM with other Cerebellar LESIONS**:

J. B. F. GIRARDIN, hæmorrhage. *Journal de Physiologie*, 1882.
C. GUIOT, hæmorrhage. *Clinique des Hôpitaux*, vol. i.
WILLIAM STOKES, hæmorrhage. *London Medical and Surgical Journal*, vol. v.
R. DUNGLISON, inflammation. *London Medical Repository*, vol. i.
H. DEMME, bullet wound. *Militär-Chirurg. Studien*, 1864.
E. R. A. SERRES, inflammation and hæmorrhage. *Journal de Physiologie Exp.*, 1828. Six cases.

Examples of **SATYRIASIS with Cerebellar TUMOURS** causing Congestion:

MARTINEAU, *Bulletins de la Soc. Anat.*, 1859.
BORDIER, *ibidem*, 1865.
JOHN D. FISHER, man, age seventy-three. *American Journal of Medical Sciences*, vol. xxiii.
JOHN ELLIOTSON, *Lancet*, 1837.

Examples of **SATYRIASIS with other Cerebellar LESIONS**:

HOSPITAL, inflammation. *Annales Médico-Psychol.*, 1875.
CAFFORT, inflammation. *Archives Gén. de Médecine*, 1830.
ROBERT BIANCHI, inflammation. *Lancet*, 1855.
ROBERT DUNN, inflammation. *Medico-Chir. Transactions*, 1849.
H. SCHULE, inflammation. *Sectionsergeb. b. Geisteskranken*, 1874.
A. W. FOOT, tubercular disease. *Dublin Journal of Medical Science*, 1872.
BOTTENTUIT, hæmorrhage. *Bulletins de la Soc. Anat.*, 1869.
Sir JAMES CRICHTON BROWNE, injury. *West Riding Lunatic Asylum Medical Reports*, vol. ii.
FRANCIS SKAE, injury. *Edinburgh Medical Journal*, vol. xi.
E. ROSSI, *Il Manicomio*, 1891.
A. OTTO, *Archiv f. Psychiatric*, 1874.

Examples of **NYMPHOMANIA in Cerebellar TUMOURS** causing Congestion:

EISENSCHÜTZ, girl, age eight. *Jahrbuch f. Kinderheilkunde*, 1868.
W. EBSTEIN, prostitute, *Virchow's Archiv*, vol. xliv.
BENNETT, girl, age eleven. *Gazette Médicale*, 1834.
SCZYPIOVSKI, *Thèse de Paris*, 1890.
M. JASTROWITZ, *Deutsche Mediz. Wochenschrift*, 1888.
STEINER, *Wiener Medizin. Wochenschrift*, 1870.
J. S. BRISTOWE, girl, age twenty. *Brain*, 1884.

Examples of **NYMPHOMANIA with other Cerebellar LESIONS**:

M. JASTROWITZ, inflammation. *Lokalisation im Gehirn*, 1888.
PAYEN, inflammation. *Essais sur L'Encèphalite*, 1826.
G. FOSSATI, abscess. *Journal de Phren.*, vol. v.
S. W. B. WILLIAMS, prostitute, softening. *Journal of Mental Science*, 1869.
GUSTAV SPIES, hyperæmia. *Traumatische Manie*, 1869.
FR. MESCHEDE, inflammation. *Allg. Zeitschrift f. Psychiatrie*, 1873.
E. HITZIG, suppuration, no inco-ordination. *Archiv f. Psychiatrie*, 1884.
F. MAGENDIE, *Lancet*, 1837.

Examples of **SEXUAL EXCITEMENT**, Obscene Acts, Disgusting Language, etc.:

P. W. MacDONALD, woman, eighty-nine, *Brain*. 1890.
GUSTAV SPIES, hyperæmia. *Zur Casuistik d. Traum. Manie*, 1869.
M. SOMMER, injury. *Monatsschrift f. Psychiatrie*, vol. xxii.
CLOVIS GALLOPIN, inflammation. *Annales Médico-Psychologiques*, 1879.

Examples of **SEXUAL PERVERSION in Cerebellar LESIONS :**

J. W. PLAXTON, carnal assaults, inflammation. *Journal of Mental Science,* 1890.
MUHR, atrophy. *Archiv f. Psychiatrie,* 1875.
F. SKAE, injury. *Edinburgh Medical Journal,* 1866.
WM. STOKES, injury. *London Medical and Surgical Journal,* 1834.

Examples of **ATROPHY of Cerebellum in CASTRATION** before Puberty :

DANNECY, *Annotations Pathologiques,* 1817.
D. J. LARREY, *Bulletins de la Soc. Anat.,* vol. v.

DEGENERATION and **ATROPHY after Destructive Disease** of Genital Organs :

T. B. CURLING, *Diseases of the Testis.*
AMALDI, *Rivista Sperimentale di Freniatria,* vol. xxi.
J. L. LEVISON, *Lancet,* 1851.
ROBERT BAHRDT, *Jahrbuch f. Kinderheilkunde,* 1874.

Examples of **IMPOTENCY after Cerebellar LESIONS :**

MOULARD MATIN, tumour causing atrophy of cerebellum. *L'Union Médicale,* 1868.
F. OBERNIER, tumour causing atrophy of cerebellum. *Tumours of the Brain.*
MILLENBERGER and ROBIN, tumour causing atrophy of cerebellum. *Gazette Médic. de Paris,* 1855.
J. L. B. CRUVEILHIER, tumour causing atrophy of cerebellum. *Anatomie Pathologique.*
T. B. CURLING, atrophy of cerebellum after injury. *Diseases of the Testis,* 1878.
EDITOR, atrophy of cerebellum after injury. *American Medical Int.,* 1839.
FIEDLER, atrophy of cerebellum after injury. *Zeitschrift f. rat. Medizin,* 1869.
BONVILLE BRADLEY FOX, atrophy of cerebellum after injury. *Journal of Mental Science,* 1891.
JOHN D. FISHER, atrophy of cerebellum after injury. *American Journal of Medical Science,* vol. xxiii.
FOLKE HENSCHEN (Stockholm), serous cerebellar cyst in man never potent. *Zeitschrift f. Klin. Medizin,* 1907.
THISU, suppuration. *Arch. Géner. de Médecine,* vol. xii.
MAGNUS HUSS, suppuration. *Seraphim Lazaret Report,* Stockholm, 1842.
GIUSEPPE SEPPILLI, *Rivista Sperimentale di Fren.,* 1879.
J. L. LEVISON, *Lancet,* 1851.
BOULANGER, *Un Cas d'Atrophie du Cervelet,* Geneva, 1909.

RETURN OF **MENSES in Women over Seventy** after Cerebellar *Hæmorrhage* :

G. ANDRAL, *Lancet,* 1836.
ROMET, *Revue Médicale,* 1824.

Examples of **ARRESTED GROWTH OF SEXUAL ORGANS** with arrested development of Cerebellum :

GIUSEPPE SEPPILLI, woman, age thirty-two, never menstruated. *Rivista Sperimentale di Freniatria,* 1879.
JOHN D. FISHER, man of forty-five like boy of ten. *American Journal of Medical Sciences,* vol. xxiii.
CRISP, man of forty-seven like boy of eight. *Lancet,* 1840.
ANGELO VERDELLI, boy of nine like age three; cerebellum size of walnut, *Rivista Clinica,* 1874.
J. WIGLESWORTH, two cases. *Journal of Mental Science,* 1893.
D. J. LARREY, two cases. *Observation on Wounds,* 1832.

Examples of **PREMATURE DEVELOPMENT** of Sexual Organs :

JOHN ELLIOTSON, cerebellar tumour; girl fully developed at five. *Lancet*, 1837.

EISENSCHÜTZ, cerebellar tumour; boy fully developed at eight. *Jahrbuch f. Kinderheilkunde*, vol. ii.

C. G. CARUS, abnormal size of cerebellum ; girl fully developed at four ; menstruated at two. Examined by Prof. Beck and Seiler, of Dresden. *Canstatt's Jahreberichte*, 1842.

SECTION III

GENIUS, INSANITY, AND CRIME

CHAPTER XXXIII

HEREDITY, EDUCATION, AND THE CHARACTERISTICS OF GENIUS

NATURE AND NURTURE

No two persons think, feel, or act in the same way ; no two take the same view of any question ; no two can be said to observe the same object in an identical manner or from the same standpoint. The intellect of each works on different lines according to inherited proclivities, individual experience, and education. It is this diversity which forms the basis of distinct individual personality.

If we regard the intellectual powers and moral sentiments, we cannot fail to observe how differently they are manifested by different individuals. The beauties of nature inspire in some men the most exalted sentiments, while the great majority of mankind remains unaware of natural beauty, or values it by some economic standard. A poetic mind will find joy in the ripple of a stream which the farmer values only as a cattle-trough. The stately oak of the forest is valued by the timber merchant according to the number of planks it contains, while to the moral philosopher it is a synopsis and a symbol of history, of the growth and decadence of all sublunary things, of the mystery of life and death.

Though there are no two human beings alike in their mental constitution, in their abilities and character, yet **the primary mental powers are alike in all.** Individual differences, therefore, arise from the varying strength of each of the powers, and the variety of their combination. All the differences of individual minds resolve themselves into differences of degree among the same identical qualities.

Assuming each individual to possess all the faculties which constitute the human mind, in what a variety of degree of relative strength do they appear in different persons ! In one, the love of glory is the feeling which surpasses all ; another is deaf to the voice of censure and callous to the accents of applause. The soul of one melts with softest pity at a tale of woe ; while the eye of another never sheds a sympathetic tear. One individual spends his life in an ardent chase of wealth, which he stops not to enjoy ; another scatters in wasteful prodigality the substance of his sires, and perishes in want from a mere incapacity to retain. One vast intellect, like Newton's, fathoms the profundities of nature ; while the mind of another can scarcely grope its way through the daily occurrences of life. The towering imagination of a Shakespeare or a Milton soars beyond the boundaries of sublunary space ; while the sterile fancy of another sees no glory in the heavens and no loveliness on earth.

The human mind has certain innate or inherited tendencies which are the essential springs or motive powers of all thought and action, whether individual or collective, and are the bases from which the character and will of individuals are gradually developed under the guidance of the intellectual faculties. These primary innate tendencies have different relative strengths, and they are favoured or checked in very different degree by the social circumstances of men in different stages of culture. These **tendencies,** in stronger or weaker degree, are not only present in men of all races and all nations, but we find all of them, or at least the germs of them, in most of the higher animals. It is the environment which awakens our dormant powers; and through speech—enabling intercourse with our fellows—and by reading, we become acquainted with the personal and accumulated knowledge of the race. In estimating the mental capacity of an individual, or of a race, distinction must be drawn between these latent tendencies and their actual development.

Men do not start with a fair field, because they are affected by their hereditary proclivities; and they do not start on equal terms, because some are more favoured than others by their surrounding circumstances. Our life is to a large extent predetermined by the innate dispositions and their relative strength. Fortunately not entirely predetermined, because human nature can be modified, principally by three factors: (1) by external circumstances, *i.e.*, the society in which we live; (2) by education, *i.e.*, the training of the mind; and (3) by experience. The intellectual capacities need education; the instinctive tendencies need no training for their manifestation; on the contrary, civilisation demands their inhibition.

It is doubtful whether the civilised mind differs from the savage mind even in respect of a higher intellectual development; certainly the instincts and passions are the same. It is doubtful whether the great mass of men in our day exercise so much more complicated mental functions than the savages. Those who invent nothing, improve nothing, and, confined to their trade, swim with the great stream of imitators, understand only a small part of the manifold machinery of modern civilisation. Even our experts, owing to the rigid division of labour, have to take a great deal for granted outside their own subjects. Man is a reasoning animal; but how much does he reason for himself? He owes most of his opinions to inherited proclivities, tradition, custom, convention, creed, law, education, and the daily newspaper; and all the reason he practices is to make deductions more or less correctly from these fixed premisses. For the great majority of modern men the daily paper is the only reading and the guide of opinion. But newspapers are merely commercial enterprises, journalism an industry for the creation and manipulation of average public opinion. They represent the crowd, and maintain their popularity by their persistent appeal to average intelligence and feeling.

Mankind has not improved within historic times; only civilisation has advanced, enabling the modern child to profit by the accumulated knowledge and experiences of the race

The qualities which form our character are not inherited, only the potential dispositions to them. For example, a child may inherit a group of brain-cells adapted for the appreciation of music; the mind structure for it, it must form for itself. The developed faculty cannot be transmitted, that would mean that the entire experience on which the faculty grew could be transmitted. Only the element can be inherited, and that must be in the germ-cell. What that element, what that physiological unit, is, remains still a mystery.

The elements which go to make up an inheritance need not all be expressed in development, and they will not be expressed if they do not receive proper nurture and stimulus. The potentialities, however, whether physical or mental, whether in the field of intellectual aptitudes or that of the instincts and emotions, are determined from the moment of fertilisation. By changes in the outward conditions of life the

expression of these powers and features may be excited or restrained. If the external opportunity be withheld, the particular disposition may never be manifested. But **the environment has no creative capacity**; that must be inborn.

The father may have a latent predisposition to a certain characteristic, which may never have manifested itself, at least not in recognisable form; but the son, owing to stimulating factors coming into play, may manifest the father's latent characteristic. This is much more so the case with reference to the mother. Not all the emotional dispositions, and still less the intellectual abilities, which lie dormant are brought out in women, owing to the restrictions of domestic life and their being sheltered in the struggle for existence. But they may come out in the son. The talent or other disposition which characterises the son may be inherited from the mother, but on inquiry it will frequently be found that her latent capacity came from her father.

A characteristic may be kept neutralised by other characteristics; and it may happen also, as we have just seen, that **it may never meet with the stimulus necessary for its expression** in development, especially when the girl takes after her father and the boy after his mother.

Just as heredity provides us with the intellect common to all of us, so does it provide each of us with those minute differences of character in virtue of which no one of us is precisely like another. It gives us our various characters, as it gives us our various faces. It gives us, in addition to our common power of thinking, infinitely varied assortments of thoughts, feelings, and propensities, written before our birth in a species of invisible ink, which the light or heat of life gradually renders visible.

Some people credit education and surroundings with all these varieties; ascribing to them all the qualities, whether good or bad, possessed by the adult, and deny heredity to be the most potent factor. They still hold that the human infant is born with a brain which might be compared with a neutral clean sheet waiting for writing to be impressed upon it by the influences of the environment. They fail to see that the human infant is endowed with a brain—a living substance—with **limitless reserves of potentiality,** which are ready to be realised, not by passive impressions of the environment, but by *active reaction to its stimuli*. Nurture cannot give a child sight if born blind, music if born tone-deaf, or even a passion for the acquisition of wealth without the underlying native propensity. Nurture may modify or develop existing tendencies; it cannot create them. On the other hand, given a mental disposition, its scope is indefinite and the combinations of the various dispositions (of which we have given examples in previous chapters) are also indefinite. There are therefore two chief factors in growth: **heredity, which gives us realisable potentiality, and environment, which makes the realisation of potentiality possible.**

If nurture were all-powerful, an English infant transferred to France and brought up by French parents should be as French as a genuine French child; but this is not the case. The predominance of heredity is shown by the persistence of national characteristics. The Germans of to-day have still many of the dispositions which distinguished the Teutons at the downfall of the Roman Empire. The French race has still some of the characteristics of the Gauls described by Cæsar; their love of display and effect, their sudden enthusiasm and an easy discouragement, their fondness of ornament and talent for art, their gaiety, fickleness, and amorousness.

On the other hand, while it is true that **our main potentialities—mental, moral, and physical—are fixed by heredity,** it does not follow that all the possibilities of good or evil that may be latent in a given personality are bound to develop, or that education and other environmental influences are of no avail. It is our possible, not

necessarily our actual, personalities that are predetermined in the germ-cells; as to which of these possibilities shall and which shall not be realised, much must depend on the circumstances under which growth and development proceed. Growth being a function of the interaction of intrinsic and extrinsic activities, there can be no predetermination of the organism unless that of the environment is also assumed. Faculties of a desirable kind may be strengthened by use until their due response to the familiar stimulus has become a habit; conversely, by denial of the opportunity of response, undesirable tendencies may be starved and eradicated.

No one will deny that **nurture can do much.** Many a puny child of the slums can, by means of judicious feeding, attain the stature and the build of the country child. The mind may be directed so that he who in the environment in which he was born would have developed into an uneducated member of the proletariat may become a man of letters or of science. He who would have rapidly developed into a criminal, a danger and an expense to the community, may by due training develop into the benefactor of his race. But all these things can only be done if the child possesses the natural tendencies to develop in these directions. What man can by mere willing add one cubit either to his mental or to his bodily stature? What teaching could ever raise the congenital idiot to the common level of human intelligence? Man has to win wisdom and goodness for himself under the schooling of experience, and it will be easier for him if his ancestors (on both sides) have been wise and good.

The most urgent problem is not so much the improvement of human inheritance as the fuller utilisation of existing talents. **The potentiality of greatness is far commoner than is generally supposed,** but in the majority of cases is not fully evoked. Education should be directed to realise our potentialities; in reality it often cramps them. Still, so-called higher education often brings out potentialities which would remain dormant in the lower spheres of life. A man may have artistic, musical, literary, scientific, social, or other tendencies within him; but if the son of an agricultural labourer he may grow up an uncouth bear. Yet he may have in him capacities for refinement or culture which would have been developed in a different environment.

Each seed is fraught with its own destiny. It will grow, if it is allowed to grow, to what is in large measure a predetermined form. The elements of mind are of racial inheritance—common to the whole race; but their arrangement and quality are lineal. We all inherit the same bodily structure in its main elements, but each one of us differs in the size, form, colour, and proportions of that structure, which we inherit from our lineal ancestors and which distinguish us individually. Racial heredity gives us a face; but lineal heredity gives us a particular face. Neither of them gives us expression, which is the spiritual feature of the outer man, within his control. A man cannot alter the form of his face, but he can alter its expression.

In the new-born infant the character of the stock lies latent, and the ego is little more than a bundle of potentialities inherited from *both* parents. The range, the reach, the latent possibilities of our potentialities are unknown to us, and they require stimulus for growth. Since the child gets its first stimulus from its parents, those qualities resembling the parental qualities are encouraged; those differing are discouraged.

A child's soul is a complex of potentialities—intellectual, emotional, æsthetic, moral and spiritual—an indefinable, illimitable, inextricable tangle of latent tendencies, capacities, instincts, passions, desires. Some of these will soon press for realisation. Others will wait their time in the background. Others, in the absence of a favourable environment, will remain unrealised. That the baby will in due season think, reason, plan, love, sympathise, imagine, and so forth, may safely be predicted. But the range, the reach, the latent possibilities of these great tendencies are wholly unknown to us. The embryo of every man—whether the descendant of

serf, emperor, fool or philosopher, felon or saint—is a complex of limitless possibilities, mental, moral and spiritual, as well as physical ; which will affirm that the possibilities outweigh the inherited elements, and that each human being is free to draw upon the reserves of potentiality out of the inexhaustible fountain of his "soul," to the extent that his inherited instrument permits, and to the extent of the stimulation of the environment, which draws out the capacity.

It seems certain that **the great majority of inborn differences between parent and offspring are due simply to new combinations of previously existing capacities and dispositions.** It is easy to see that with sexual reproduction, where two parents are involved in the production of the offspring, there is a continual mixing of different germ plasms, and thus almost infinite chances of new combinations. Considering the long line of ancestors, and that half the cells come from the male, and the other half from the female side, there is room for innumerable variations, and the wonder is that there is any resemblance at all.

Much has been said about the differences observed between the various offspring of the same parents, particularly if there is one child with habits not to be found in either mother or father. But we must not forget, just as two elements in chemistry, each of them harmless, can combine to form a virulent poison, so two harmless elements, one derived from one parent and one from the other, can be inherited by the child and form a combination which, if not checked early, may be detrimental to its future. The child may inherit the characteristics of one parent only, or partly those of one and partly those of the other ; or it may exhibit the father's characteristics at one time of life and at another time these may be replaced by those of the mother. It very often happens that certain individuals inherit a prepotency for the transmission of their own special characters, which always predominate in the offspring to the exclusion of those of the other.

It has been said that the exceptional talents and characteristics of some men are due to accidental causes, but the same opportunity is offered to a great many men, while only one is inspired. The fact is that education and surrounding circumstances are only powerful on those men whose innate dispositions are neither too feeble nor too energetic. A man of talent may have an imbecile for his child, but no man of talent ever had an idiot or imbecile for his father or mother.

An acquired character is a structural change in the body directly induced during the lifetime by a change in environment or in function, and persisting after the factors inducing it have ceased to operate. Physiologically stated, the question is whether we can conceive that structural changes in the body of a parent, induced by changes in functional or environmental influence, can so specifically affect the reproductive cells that these will, if they develop, reproduce in any degree the modification acquired by the parent or parents. May the result of peculiarities in parental "nurture" be as such transmitted, or is it the germinal "nature" alone that constitutes the inheritance ? Will the offspring exhibit the modification which the parent acquired ? That depends what the modification is ; and, at best, only the *tendency* to the modification can be inherited.

It is still held by biologists as a sort of dogma of faith that acquired characters are not transmitted ; but one of the latest experiments appears to prove the influence of environmental conditions.

For some years the Austrian zoologist **KAMMERER** has been carrying out a series of experiments with toads. Alytes differ from the frogs and toads, generally, in breeding on land ; and the male is without the horny patch on the hand, possessed by all water-breeding forms to enable them to retain their hold on the females under water. The young are hatched out in water as advanced tadpoles with the external gills already covered over. Kammerer's experiment was to keep Alytes in a warmer temperature than usual, with a tank for bathing when disposed. The toads under these circumstances began to mate in the water ; and, with appropriate

safeguards, some of the eggs came to maturity, and the young of this generation were hatched out less mature, with one external gill on each side of the head. These tadpoles, when mature, pair in the water and produce tadpoles with three external gills (like the ordinary water-breeding forms), and the male, when mature, has a horny patch on the under surface of the hand. Five generations have now been bred ; and the males in all have the horny patch on the hand, all breed in the water, and hatch out with three gills showing. Kammerer has, to all intents and purposes, changed a species by changing the environment, and the acquired character is breeding true.

The ordinary biological teaching to the effect that the inheritance of the child is not affected by the education of the parent is largely based on a deduction from observations on the colours of animals and some experiments of amputating the tails of mice, or, as in the example just quoted, the horny patch of tadpoles. On the other hand, we note that men have been educated more or less regularly in our schools for several generations ; horses have been educated on the race-track ; and hunting-dogs have been educated in the field. We are led by these observations to the conviction that **educability can be inherited,** that improvement in mental and physical powers from generation to generation comes directly as the result of educating each generation in succession. The biologists tell us in reply that the predisposition to educability is already in the germ, and is not an acquired character. They say that there may be in the organisation the rudimental possibilities for an acquired character, so that it is really congenital ; just as every congenital quality is also acquired, *i.e.*, requires to be nurtured by appropriate conditions if it is to develop. It is not the character, but the tendency to the character, which is transmitted, but the tendency is already inherent in the germ. Acquired characters, *i.e.*, the abiding effects of external conditions, can be expressed only when the organism possesses inborn tendencies to respond to outside conditions ; and inborn variations, *i.e.*, modifications due to changes in the germ plasm, can be expressed only under certain conditions of environment ; so that the distinction between acquired characters and inborn variations is not easy, and can be distinguished only by experts. According to **G. ARCHDALL REID,** " no single transmission of an acquired character has ever yet been proved."

The biologists tell us that " if acquired characters were passed on we should expect to find small waists resulting from tight lacing, and children able to read and write without having to learn." The reply to this argument is that the lacing of women's waists is rarely so tight that it affects the shape of the body and the position of the internal organs permanently, and that it is by no means proved that women who have laced tightly for generations have not smaller waists. We need only compare the figure of the average Parisian woman with that of the average German woman. And as regards the second example, no child is born that can read or write, but every normal child inherits the apparatus and capacity for such acquirements. Children that cannot be taught to read and write are classified as feeble-minded. It is the disposition that is inherited, not the acquirement itself.

The ordinary man, who is not a biologist, puts forward some very strong reasons for the transmission of acquired characters. He says that if they are not transmissible, then the finest mental and moral traits in the parent will not benefit the offspring, cannot be transmitted to them, but have to be acquired in each case by intensive early training, giving them the right start in life. He says that if properties acquired by the parent or parents are not inherited by the children, then the sins of the fathers do not tell upon the children ; no matter how the parent ill-treats his body prior to conception, his progeny is unaffected. The man may have tuberculosis or syphilis, but provided he has not infected the mother and, through her, the fœtus, he is likely to have as strong and healthy a child as that of a perfectly sound parent.

In the opinion of the biologists, the tendency to the finer mental and moral traits is due to some original modification in the germ plasm and is not acquired. They point to the children of the slums and of degraded parentage, and claim that when these are given a healthy life in healthy surroundings they do develop into citizens of as good quality as those of good parentage. To them, nurture is everything, and nature negligible. If the observed facts do not tally with this view, then we are told that the incidence of particular conditions in the offspring is due to diathesis ; that the child possesses a stigma of degeneration which originated in the family history of generations ago, and has arisen by chance—mutation ; or that the observed weakness of the child of diseased parentage is not inherent, but due to environment—poor food and wretched surroundings which prevented a healthy bringing up.

Professor **BINSWANGER,** of Jena, a famous psychiatrist, expressed his inability to find evidence that a mental or nervous disease was acquired during the individual life. If this were so, the tendency certainly would have to be in the germ plasm. It has to be remembered, however, that diseases are not inheritable in the identical manner, but what is inherited is—a vitiated constitution. The parental disease need not produce the same disease in the offspring, but may produce some other. According to my own experience, there is one mental disorder which certainly seems to run in families, that is—*melancholia.* I refer to such cases only in which no insanity was manifested until middle age ; yet in most of these cases I have been able to trace the characteristics which are common to melancholics as having existed from infancy, namely, a reserved character, lack of sociability, small self-esteem, over-conscientiousness, hypersensitiveness, etc.

Again, as regards the statement of some biologists that, with reference to the morals of children, nurture is everything and nature negligible, my experience does not support this view. In consequence of my theories regarding the significance of the shape of the head, I have had more opportunities than physicians generally have of watching the careers of boys and girls of tainted origin. I have seen not only numerous idiots, imbeciles, weak-minded and backward children, but children addicted to romancing, lying, thieving, premature and perverse sexual habits, and other immoral addictions. Some of these were incurable, and I have been enabled to follow their careers—of some for thirty years—my case-books containing the records of repeated convictions, until owing to the numerous aliases I failed to trace them any longer. Detention in reformatories did no good in these cases, nor the prison in later life, probably because they were mentally abnormal, though not insane. Incidentally I may mention that when the shape of the head of the child is normal I give hope to the parents ; when it is badly formed, my prognosis as to the future of the child is unfavourable. But how many physicians ever look at a head, and, if they do, how many have any theory what the shape ought to be ?

We know that the brain controls the whole of the life processes of an organism. Therefore, **those acquired characters which do not affect the brain directly are not transmitted ;** on the other hand, those which modify the brain and nervous system, either through voluntary or involuntary action, are transmitted ; but as *tendencies* only.

Modifications acquired as the result of use and disuse are not transmitted. That which is transmitted to the infant is not the modification, but only the power of acquiring the modification under similar circumstances.

It is a matter of common observation that mutilations are not inherited. Wooden legs do not run in families, although wooden heads do. We may cut off the mouse's tail for generations, and yet they will still be born with their tails. Such mutilations have no modifying influence on the nervous system and brain in particular, and therefore cannot be inherited. Loss of a limb or any other portion of the body does not affect the brain, at least not to any appreciable extent. But if,

through change of circumstances, new efforts for the preservation of existence are called forth, such efforts must originate from the brain, and hence the brain is directly modified, and this change of structure may be transmitted. We thus learn that not all kinds of acquired characters are inherited, but only those which produce a modifying effect on the governing portion of the nervous system, that is, the brain.

If an animal, through a change of circumstances, has to make certain new efforts to obtain food, etc., these efforts must originate from the brain, since they are voluntary; hence the brain is directly modified, and the parts in connection therewith are also modified. And if the change in circumstances is permanent, inducing similar efforts on the part of the offspring, gradually the modifications thus produced are inherited, and in time, if the changes in structure are typical, change of species occurs. Again, if through a change of climate an organism is affected through the whole of its surface nerves, a direct impression is made on the brain, which impression leads in time to a permanent modification of character. Such a change of character and its inheritance is seen in a change of complexion, as, for instance, where Europeans gradually acquire a darker skin; and also where wool gives place to hair, as in sheep introduced from a cold or temperate climate to a tropical one.

We need no man of science to tell us that the Ethiopians cannot change their skin, or that one drop of negro blood in an otherwise white family betrays itself for generations in the finger-nails, in the complexion, and in the hair. Mental characters reappear in precisely the same way. That such, indeed, is the case frequently, has been matter of common observation ever since man first began to observe. From which of his parents or grandparents does the child get this or that quality—his taste for music, or drawing, or his good or his bad temper? These are questions which people have been always asking.

As man descends into the grave, so pass with him for ever all the endowments and wisdom which his genius and labour have accumulated during his lifetime. Were it otherwise, the toil of education would have been mitigated, and there would have been no bounds to the mental acquirements of the race. **Knowledge certainly perishes, but not the ability to acquire knowledge.** This is increased with the growing complexity of the brain. It is not the knowledge that is hereditary, but the disposition to the acquisition of some particular branch, whether of music, poetry, or money-making.

Everyone knows that the children of musicians may so vary as to be more or less musical than their parents, and yet all be more musical than the average man. Suppose the most musical men marry musical women, we thus have generations following, some of whose members are increasingly musical by normal variation. This happened in the Bach family and by the same process as the development of the racehorse—a selecting of the best developed, and the intensification of the variation and not transmission of the acquired modifications. Only a small proportion of them vary so as to be more specialised than their parents, so that they are not all great musicians, nor are all the racehorses great racers. Each child has to acquire its musical knowledge just as painfully as its parents; the only thing that it inherits is the ability to do this.

If we do not accept the Darwinian doctrine, and deny all evolution of mental and physical power, then each kind of animal must have been originally created equal to anything which has since existed. Otherwise a parent must transmit more than he inherited. That "more" must be something inherited, or it must be some special creation associated with reproduction. We cannot get something out of nothing. If there has been an evolution of mental and physical powers at any time in the past, that evolution was necessarily the product of work performed. But has man evolved?

Enough has been said to show the necessity of ascertaining the laws of heredity, or the transmission of acquired abilities, the transmission of disease, etc. When we have ascertained these laws, we shall be in a position to apply them practically to the improvement of the race. With our present knowledge, the practical application of **eugenics** presents too many difficulties.

To some men, however, nothing seems easier. They point to the artificial breeding of domestic animals. In reality the two things are altogether different. In breeding animals a higher race of beings manipulates a lower race with the object of securing definite points that are of no use whatever to the animals themselves, but of considerable value to the breeders. Even if we had the ability and the power, we should hesitate before we bred men and women as we breed dogs or fowls. We can breed for "points" and add to the swiftness of the horse, the strength of the ox, the sagacity of the dog; but should we breed men for points as with animals? Would the State have a breed of human mastiffs for its policemen, of human greyhounds for its postmen, and so on?

One cannot improve the efficiency of animals in any one point to any high degree without upsetting the general balance of their constitution. The racehorse can run a mile on a particular day at a particular place with wonderful speed; but that is about all he is good for. His health as a whole is so surprisingly feeble that he has to be treated with as much care as a delicate exotic. We can foster particular points in animals and plants, but it would seem we can only do so by lowering their general vitality. And when we come to deal with the infinitely more complex individuality of man, what hope would there be of our improving the breed by deliberate selection? If we developed the intellect we would probably stunt the physique or the moral nature; if we aimed at a general culture of all faculties alike we would probably end by a uniformity of a level mediocrity. Besides, the most intellectual men and women are not the most fertile.

It is a mistake to expect that human beings can be mated the same as animals for the improvement of the breed, for marriage is not a question of the head only, but also of the heart. We must not forget the love element. It must be remembered that people do not marry merely for the "procreation of children," but also for the mutual society, help and comfort that the one ought to have of the other. Most men and women marry, not thinking of their offspring at all, but because they are congenial and helpful to one another. We cannot know our wives or husbands until we have lived with them, and genuine love produces that adaptability which makes life afterwards comfortable and happy and its burdens bearable. One has also to remember that, having got the perfect couple, they may refuse for financial or other reasons to have more than one or two children.

Human personality is such a complex organisation that it is extremely difficult even for the man himself, not to speak of any stranger, to pick out a suitable helpmeet. And if we succeeded in all cases in finding the right partners, we should only crush out originality in the offspring and produce a tame, stereotyped pattern of amiable mediocrity. Undoubtedly many marriages are arranged on grounds of convenience, cupidity, or snobbishness. Let an heiress be ever so ugly, unhealthy, hysterical, or mad, somebody or other will be ready and eager to marry her on any terms. Considerations of this sort have helped to stock the world with many feeble and unhealthy persons. Among the middle and upper classes it may safely be said only a very small percentage of marriages is due to love alone; in other words, to instinctive feeling. The remainder have been influenced by various side advantages, and nature has taken vengeance accordingly on the unhappy offspring.

The love instinct is an essentially beneficent instinct, developed and maintained in us for the very purpose of insuring just those advantages which some eugenists want to effect by a conscious and deliberate process of selection. The mutual

attractiveness and mutual adaptability are bound to have a beneficial effect on the offspring. We fall in love with the young, the beautiful, the strong, the healthy. We do not fall in love with the aged, the ugly, the feeble, and the sickly. No law is needed to prevent a man from marrying his grandmother; and cripples, physical or mental, do not usually have the same chances in the marriage market as healthy men and women. Marriages between seriously afflicted people are rare, but there are many people with neurotic tendencies who marry, which tendencies before marriage, in consequence of the easier life, may have remained latent, but break out in women with the strain of child-bearing, and in men when the struggle for existence becomes too acute.

Beauty is one of the best guides, so far as race-preservation is concerned. As GRANT ALLEN pointed out many years ago, a fine form, a good figure, a round arm and neck, a fresh complexion, a lovely face, are all outward and visible signs of the physical qualities that tend to make up a healthy and vigorous wife and mother; they imply soundness, fertility, a good circulation, a good digestion. Conversely, sallowness and paleness are roughly indicative of dyspepsia and anæmia; and what we call a bad figure is really in one way or another an unhealthy departure from the normal standard of the race. Nor are indications of mental efficiency wanting. A good-humoured person shows the indications in the expression of his face. Idiotic countenances can never be beautiful; narrow, low, receding foreheads strike us unfavourably; so does, in fact, any departure from the average type of head.

Sometimes neither man nor woman is to blame for an ill-adapted marriage, for each man marries, even in favourable circumstances, not the abstractly best adapted woman in the world to supplement or counteract his individual peculiarities, but, as he thinks, the best woman there and then obtainable for him. The result is frequently far from perfect, but it is no worse than if made by strangers, if the choice were similarly restricted. If only we had our liberty in choosing, less mistakes would be made. But, after all, the choice is limited to one's circle, and, even in that circle, restricted by many conventions. Widen the possibility of selection and remove the restrictions of income, and love will manage things better than any committee of anthropologists for the choice of partners can ever do it.

So far *positive* eugenics, which deals with the measures to be adopted to ensure the continuance in sufficient numbers of the normal members of the race and those superior in mind and physique. *Negative* eugenics deals with the prevention of the increase of the unfit, the prevention of breeding from lunatics, epileptics, consumptives, drunkards, habitual criminals, imbeciles, and other mental defectives. The object of negative eugenics is the elimination of the bad stock of the population. The State is to interfere with stringent regulations of marriage, prohibiting union of the whole class of degenerates. It is rightly argued that persons tainted with any incurable physical or mental infirmity have no more right to carry suffering and contamination amongst the people than has the person suffering from smallpox to do so by travelling in a public conveyance.

The elimination of the unfit does not, of course, imply an increase of the fit. It must be remembered also that, besides the extreme cases in which the hereditary taint, the predisposition to disease, is so decided that marriage should not be thought of, there is the still larger class of those in whom the taint is so mitigated that, with a properly selected partner, a fairly healthy family might be reared. Should we prohibit those as well? Can we forbid marriages of a healthy man or woman whose father or mother has been seriously afflicted? Can we speak with certainty? And thus we are confronted with the question as to how far the State has a right to employ coercion or restraint. There is a strong repugnance against all coercive or repressive legislation affecting the social customs and habits of society, which is shown by the constant desire to evade it. If there is to be restriction in marriage in the case of persons who are unfit to marry, one has to face the

alternative, which is so often forgotten, that marriage is not an essential preliminary to procreation. It must be borne in mind that there is such a thing as illegitimacy. The people to whom it is essential that this gospel of deliverance should be preached are precisely the people who pay no heed to it. For this reason, sterilisation of the unfit has been proposed ; but, before such a drastic remedy is entertained, society would first require to know the effect upon those on whom such mutilation is proposed of better housing, better sanitary conditions, compulsory seclusion in retreats, reformatories, and labour colonies.

There is one precaution, however, at the disposal of all, and which everyone should take before taking a partner for life, and that is, they should demand a medical certificate of fitness for marriage. No healthy person of sound ancestry would refuse to submit to an examination, and, if there is some defect, the union is at all events entered into not blindly, but with full knowledge of the facts.

EDUCATION

Cultivation strengthens powers in themselves vigorous ; but education cannot render energetic dispositions or capacities which nature has created feeble. We cannot convert an idiot into a profound philosopher , and there are idiots in art, mathematics, etc. Accordingly, every system of education must be defective which has no reference to the characteristic talents of the scholar, who, for example, though he may be a dunce in classics and slow of recollection, may possess a turn of mind which will some day lead him to great discoveries and rank its possessor amongst the eminent of mankind. If education, properly understood and practised, is what the word implies, a drawing out of the native powers of the mind, a wise direction and control of the process of spontaneous development of innate tendencies, it must be worth while to find out what are those innate tendencies and what is their normal course of development. We want a psychological delineation of individual dispositions, temperament, and character. Children should be tested in the capacity for the different subjects before actual training is commenced.

As regards elementary education, the best known of the methods for testing the mental ability of school children is that devised by **BINET,** the purpose of which is to rank them according to mental age. For example, a certain child is chronologically, let us say, fifteen years old, yet physiologically he may be only eleven, intellectually ten, and pedagogically twelve. The last number indicates his past achievements at school. The child's grade in the school does not always correspond with his mental age, and it becomes highly important to ascertain what his mental age is—that is the purpose of Binet's tests. For instance, the eight tasks that any child should creditably perform, who has a mental age of seven years, are :

(1) To indicate the omissions in a figure drawn in outline ;
(2) To give the number of one's ten fingers ;
(3) To copy a written phrase ;
(4) To copy a triangle and a diamond-shaped figure ;
(5) To repeat three numbers ;
(6) To describe an engraving ;
(7) To count thirteen separate pennies ;
(8) To name four pieces of money.

A normal child of twelve should be able to repeat seven figures, at ten six, below eight he breaks down at five, at four he handles three, at three two. The length of a series of figures, letters, or names is a test of a child's control over his attention and the inherent grip of his memory, and this ability is quite independent of any practice in learning by heart. So it is with other tests of the Binet scale. At five years a child should be able to copy a figure of a square, that of a diamond only two years later. Below seven, as mentioned above, he will not notice an omission in an outline drawing, say the omission of arms in the sketch of a "lady." Up to

eleven, one can tell him that one has locked himself in a room and is unable to get out because the key was left on the outside, and he will believe one. At fourteen, given any time by the clock, he should be able to say what time it would be if the hands were interchanged.

A good deal of discussion is waging round these tests. It is easy to doubt the value of some of them ; but on the whole they give a fair estimate of mental development, not merely a measure of the intelligence generally, but of specific memories, attention, muscular control, and of the various powers of observation and of linguistic expression. They do not tell one very much about the real mental idiosyncrasies of the child, but they enable the qualified psychologist to use his skill and natural gift to better effect.

Parents and teachers should ascertain what a boy is really capable of or may be brought to by means of education, as well as what he is not capable of and cannot be brought to by any possible means. A man finds happiness in any work in proportion as it calls into exercise those faculties of his nature that are most vigorous or most highly developed, and in proportion as he has acquired skill and excellence in it. Therefore we must select the calling of a youth in accordance with his natural qualifications and aptitudes, and make him proficient in those studies or pursuits to which his natural talents and character—as well as opportunities—most incline him. In this way would the world be most benefited and the man himself rendered most happy. **Vocational guidance would increase national efficiency and should be introduced as an integral part of school administration.**

A man who is colour-blind is, from necessity, debarred from taking charge of railway-signals ; yet, over and over again, does one see boys whose brain organisation fitted them for some other calling forced into an occupation for which they are not suited, with not a chance for distinction. Each one's calling and business in life should be selected in accordance with his natural qualifications and aptitudes for it. The blunders that mar our youth make our manhood a struggle and our old age a regret. If the parent, the schoolmaster, and the medical psychologist were to consult together as to the plan of education and the future pursuits of the child, much suffering would be avoided and good accomplished. The State and the country at large would benefit to a now unimaginable extent by its number of great men in every field of art and learning, industry and enterprise, through all the individual powers of each member of the community being directed into their proper and natural channels, according to the diversities of capacity and temperament, instead of being comparatively unproductively employed, as at present, through being misdirected.

The selection will require experts ; for though we can observe the various human activities, we cannot judge always whether the men following them have the abilities. One human ability—take the capacity for construction—may give rise to a variety of fundamental activities : architect, engineer, inventor, etc. Some activities, again, necessitate a variety of abilities ; for example, the painter—sense of colour, sense of form, etc. Again, a person may have a taste for a particular occupation, but not the necessary ability. Thus a person may think himself musical because he enjoys and appreciates music ; yet he may be an indifferent executant and be entirely without the talent of a composer.

Education begins on the day we are born and should end on the day we die. The business of parents, teachers, and schools is not to complete our education, but to fit us to become our own schoolmasters, to continue our own education, so that we may learn through life. A child should be taught enough to awaken an interest in all the sciences and arts, and to perfect itself in those for which it has an innate disposition.

Having ascertained the capacities of the child, the next essential is **to teach the child "how to learn."** As a preliminary, I would suggest that no teacher be

appointed who cannot teach. I have attended numerous colleges and heard a host of lecturers in England as well as on the Continent, but I have come across very few "teachers." The first qualification of a teacher should be to know "how to teach." Therefore none should be appointed without some test. On the other hand, the pupils, before taking up a particular subject (at least in the higher schools), should be instructed "how to learn." A few lessons by an experienced psychologist would, in my opinion, greatly improve the results. Moreover, much time and energy are lost over the learning of unessential subjects and the unessential details of an essential subject; loading the pupil's brain with knowledge for which only experts find practical use. Of some subjects a rudimentary knowledge would suffice, and a more intense study should be demanded only of those who have special gifts in that direction or qualify for some post where such knowledge is a necessity.

Next, the subject should be made interesting and brought nearer to human life. A subject is learned more easily if it is presented to us with ideas with which we are already familiar and which appeal to our innate dispositions. For example, a new language will be acquired more readily if we start with those words which have a similarity to our native tongue, and with sentences which we are in the habit of using daily. Grammar and high-class literature can come later, when we have acquired a sufficient stock of words and can express our daily wants.

Students should be made to learn in the class-room; mere lectures are a waste of time. In consequence of this defect, students everywhere have to "cram" from text-books, and many of these are written as if the student were already an expert and not a beginner. I have been consulted, in the course of my practice, by clever students who have failed repeatedly at examinations and feared some brain defect, when all that was at fault was a lack of method in learning, a proper presentation of the subject, a knowledge of which had to be acquired, and want of a system to impress the various memories, especially the visual, which is strongest in most men. Most students, teachers, and writers on learned subjects place too much reliance on the "verbal" memory to the exclusion of all others; but the verbal memory is the most unreliable, except in a few specially gifted men, as is seen by the rapidity with which subjects learned for an examination are again forgotten. Altogether, we are trained too much to believe and remember, and too little to think and judge.

In former days it was claimed that observation, memory, judgment, reason, imagination, were primary faculties; and that in exercising any one of them, by any process, we were increasing its power to deal with whatever matter might be presented to it. As if a boy who was exercised in learning poetry by rote would have his memory for dates and figures thereby improved. He may cultivate observation at school in the chemistry class, and yet he may go home and fail to see the most striking objects in the street. In truth, no man learns to do one thing by doing another. If we wish a boy to observe Stock Exchange prices, we must train him to observe Stock Exchange prices, not teach him to be an observant half-back at football; and if we wish to make him a loyal and intelligent citizen, we must teach him citizenship, and not merely demand that he be loyal and intelligent at cricket. The man who, to improve his memory for trigonometrical formulæ, tries to train it by memorising poetry, is simply wasting his time. Another fact that is too frequently neglected is that our memory is of what we have experienced, not of what we have learned. Of all that was acquired for examination purposes, only so much will be retained as was in harmony with the natural talent of the pupil.

If a man be a good observer, he can, in most cases, take time for reflection; observations he must make himself, and make them rapidly, or lose the opportunity for ever. For this reason a man can afford to be a slow reflector, whilst he cannot afford to be a slow observer, if he wishes to be a practical man; and hence it is that it is better, in nearly all cases, to have good perceptive faculties, and moderate

reflectives, than to have ever so large reflectives with but moderate perceptive powers.

The popular systems of education are by no means calculated to remedy any inherent defect in the perceptive faculties, but they are eminently adapted to increase such organic defects, by directing the mind to the study of dead languages, and to the studying of the abstract laws of observation. In the physical sciences alone can the perceptive faculties find fitting exercise when fully developed; in these alone can they find remedial exercise when naturally weak, and it is in the early years that they must be trained.

It is not uncommon to see children brought up to be very critical as regards the external world, but exercising no criticism as regards their own habits and dispositions. The parents having no fixed principles as to the great questions of life cannot impart to their children what they do not possess themselves. Such **omission of moral guidance** is as bad as being dogmatic. It is held by many parents and educators that it is best to let the young develop along "their own lines." To a limited extent this should be done; but if the child is allowed to grow up in absolute freedom, it is liable to follow its strongest inclinations—the lines of least resistance—and since in the majority of human beings the propensities are more powerful than the higher sentiments, the child will develop its animal nature and not its spiritual nature. Much of the restlessness, discontent, and spiritual uncertainty of the age is traceable to the failure of an educational system divorced from any truly authoritative, positive philosophy to furnish those who have been brought up within it with a valid view of life as a whole, and to ensure that inward spiritual training which is the absolutely indispensable complement of rational development.

An excellent method for the right training of the emotions and propensities is that adopted by some English schools of letting the boys form a sort of "Junior Republic" among themselves and governing one another. The idea originated in the United States, where it has been in operation for some years, taking the place of reformatories in the training of juvenile offenders.

Experiences make the strongest impressions on the brain. Golden rules do not make a child moral. Yet ideas and ideals must be given for the child's guidance. Habits must be formed, and ideas and ideals round these habits. A child may know a certain act to be wrong, but without a sufficient stock of ideas and experiences it will be unable to withstand temptations.

If we instruct by ideas alone, these will be selected by the child in accordance with his native dispositions. For this reason, among others, children of the same parents and brought up in the same surroundings and by the same teachers do not turn out the same. It is important, too, what ideas we instil into a child's mind, for they are not easily got rid of in adult years. Frequently a man holds particular views, simply because of certain complex ideas received in youth; and contrary ideas, however convincing to the impartial mind, have no chance with him.

Hitherto our schools trained the intellect, and neglected the training of the motives which in later life give the impulse to the exercise of what has been learned in youth. If children were educated so that they could regulate the propelling element, on which depends all their success in life, it would be of more value to them than a thorough knowledge of Latin and Greek without such instruction. Not so-called moral education, *i.e.*, the teaching of moral precepts, is needed, but the education of the emotions and propensities. Education to be complete should include the training of motives for the exercise of the intellectual capacities. Many a boy does well at school because he has natural capacity and is made to learn; but when his

college education is finished, and the stimulus is withdrawn, he ceases to learn any more. The college education trained the intellect but neglected the formation of character, which would provide the youth with aims in life. True, there is moral education of a sort, but that is directed chiefly towards rendering a youth virtuous ; it is a training of the moral faculties, not of the elementary instincts (propensities), directing them to useful activity ; it is that which is required. What is of value to a youth is the character organisation, which enables him to do well in the world, after he has left school. This organisation he is born with , his teachers may modify it, but they cannot supply it. The greatest men the world ever possessed either received a little or no higher education, or, if so, few of them distinguished themselves in their schooldays ; on the contrary, they were considered dunces, and no one ever suspected their talents and force of character. Even when a boy does well at examinations, he may not have the appearance, the neatness, the presence, the speech, and the social qualities which mean success much more often than does actual ability. Our Civil Service Commissioners have discovered that fact, and I understand that in future they are going to interview their candidates for Colonial administration before they are admitted to the competitive examinations.

Our examination systems to prove qualification for the higher walks of life are so arranged that all those young people fail who do not exhibit a certain decidedly mechanical type of intellectual ability, no matter how rich they may be in other mental, moral and practical qualities, some of them of the utmost value to the community. These systems have the deplorable effect of causing both teachers and parents to concentrate upon one narrow form of intellectual development rather than upon the harmonious development of those moral qualities which make or mar a man's future and happiness. Experience has conclusively proved that the pupil who takes first prize at school is not necessarily the best fitted of all candidates for a post of honour and difficulty in the outer world ; and naturally so, since the requirements in each case are totally different. One boy may be found in a class learning diligently, and another unable to assimilate anything at all from his books. That is a question of active endowment. In due time both boys leave school—the one still with a taste for reading, the other with latent forces of an unknown character. The reading boy settles down into a bookworm and is happy in obtaining a post as librarian or private secretary ; or, if of a scientific turn, he may devote himself to some special study and read papers at meetings of learned societies. The dull boy may turn out to be possessed of courage and daring, combined with ascendancy over his fellow-men, and become a famous administrator, helping to maintain the greatness of his native country.

No doubt book-learning is a valuable asset under present-day conditions, but it is not essential, and there are very many individuals, although scholastically dunces, who have yet sufficient aptitudes of other kinds, and, in particular, sufficient common sense, not only to take care of their interests, but to achieve a considerable degree of success in another walk of life. It is therefore wrong to stigmatise children whose minds do not run to intellectual pursuits as backward, or feeble-minded, or mentally deficient. The term " mental defect " should be restricted to those persons who are lacking in general mental capacity, in common sense—that is, to such persons who are incapable of subsisting by their own unaided efforts. We must remember that the human mind is compounded of many faculties, and none of us are equally efficient in all of them ; one lacks verbal memory and another arithmetical talent, one has no taste for music and another none for the fine arts, one cannot draw and another cannot sing, and so on.

Accepting the analysis of mental dispositions in this work, or some improved form of it, **each child should have a chart made of his main characteristics,** of his intellectual capacities, sentiments, emotions, and propensities which from time to time, as they are moulded by training and experience, can be corrected. Such

charts would also be useful for people about to marry, who would thus get to know each other's dispositions beforehand and be saved from disappointments thereafter.

We have to find out whether a boy is backward from lack of industry, energy, perseverance, self-reliance, or other force of character on which success depends, or whether he is lacking in understanding. The boy may lack ambition to exert himself. He may lack concentration, flitting from subject to subject and taking hold of none. Then there are boys who grow tired easily and cannot fix their attention on one subject for any length of time. Others work by fits and starts. They are capable of great momentary efforts, but these are divided by long intervals of cerebral inactivity. Other boys are wanting in self-esteem, in self-reliance. Others are nervous boys who are easily confused, and whose memory deserts them at the critical moment. Some boys want encouragement. There is no one to tell them " well done " when the work is well done. Some parents criticise but do not bestow praise. Some boys are lacking in will-power, and this may be due to a variety of causes, as from defective nutrition of the nervous elements in delicate children ; as, for instance, when a child is growing very fast. The boy may have no method, or no enthusiasm, or no liking for his work.

Boys can be brought up on a uniform plan of education till they are ten or twelve. But even then they should be already sorted according to ability and character, the quickly-learning being put in a separate class to those who are slow. The really able ones should be passed for higher education to the secondary schools, without fees if poor. Greater trust should be placed in the teacher's judgment than in examinations for the sorting-out. The higher education should be arranged according to ability in special subjects, which fit some for technical schools, others for classical training, others for commercial colleges, and others for trade schools. The actually backward would of course require special training and be taught some handicraft requiring not much intelligence. Arrangements should be made that students leaving these various schools find at once employment suitable to their individual abilities. This plan would give to the children of the poorer classes greatly improved chances in life, and the State would profit greatly by having the right men in the right places.

THE CHARACTERISTICS OF GENIUS

The various talents—and the brain centres for these talents—are unequally developed in individuals ; hence the diversity of faculty that we see. Special gifts are not uncommon ; indeed, they are very ordinary ; but not every man had the opportunity or the *character* to manifest his abilities to the greatest advantage of himself and the world.

Greatness resides invariably, so to speak, within the four corners of one's personality, implanted there by nature in the mysterious distribution of her gifts. Genius most frequently appears at such an early age as to put study or cultivation as a producing cause, out of the question. Musicians and artists are the most precocious, philosophers the least, the order being very much in accordance with the degree of abstractness of the subject to which their faculties are devoted. The mechanical and mathematical " bent " is as absolutely irresistible towards its own line of achievement as is that of the poets or painters towards theirs.

Genius is nearly always limited to the predominance of one or more brain powers. If the entire brain were engaged in all studies equally, as some of our physiologists believe, a man who excels, for example, in mathematics would have to excel equally in drawing or music ; but we find great philosophers who cannot learn the multiplication table, men who can draw well but cannot paint, and colourists who cannot draw. Admitting a multiplicity of centres in the brain, one can at once understand how it is that one man may excel in one thing and be stupid in another ;

as a man may have strong eyesight and be very deaf, or a fine sense of touch and no power of smelling.

Every elementary faculty which has its seat in the brain can be developed ; the fighting instinct in the prize-fighter, the hoarding instinct in the financier, the sense of colour in the painter, the sense of tune in the musician, of construction in the inventor, of imagination in the poet, of induction and deduction in the philosopher, etc.

True, a single faculty alone, except perhaps in the arithmetical prodigies, does not produce genius. For instance, imagination is necessary both to the artist and the scientist, in addition to their special gifts. Commonly it is believed that these two are opposites : the one compact of imagination, emotion, synthetic and creative power ; the other tending rather to doubt, to analysis, and to rejection of all that cannot be verified by the testimony of the senses. It is undeniable that the scientific mind is pre-eminently critical in its outlook, yet it is not by observation and experiment alone that the greatest advances in knowledge have been made. For the co-ordination of scattered observations, for the recognition of the laws of their appearance, we have need of that faculty of imagination which is typical of the practical temperament. Great as are the merits of the patient worker who accumulates the facts, the stones of the future building, far greater is the achievement of the thinker who by a flash of intuition binds them into a compact theory and thus completes the edifice with the materials provided by research.

Carlyle said : " Genius is an infinite capacity for taking pains," and others repeated the saying without further reflection. **No amount of taking pains can atone for the absence of aptitude.** Given the aptitude, then by taking pains we may achieve superiority. But why does the genius take pains with his aptitude ? The gratification of that power is a pleasure to him. The term " pains " is therefore a misnomer. Industry alone is not enough to enable the aspirant in any walk of life to become distinguished. Some men toil hard to learn what others acquire by the slightest application. Nay, more, **the act of taking pains is, itself, a natural endowment,** like a good or bad memory. No amount of taking pains can fashion a great poet, a great painter, or a great musician out of a lad who has no capacity for literature or art. The schools cannot make a mathematician, philosopher, or naturalist of a boy who does not possess the native qualities.

The man of genius is generally a man of passion. We may just as well attempt to run a steam-engine without fuel or water as to make a genius out of a being without strong emotions. A person without any emotions is without energy. Better to have passions—guided in the right direction—than to have nothing to guide and nothing to conquer. The activity of the mind depends to a great extent on the activity of the passions. Great men frequently have great passions. The average man is indolent, does not move from the habitual groove of thought. He has nothing of that activity of soul by which a man in power forms new springs for moving the world or sows the seeds of future events. It is due to their intense passions that men can execute the greatest actions, defy dangers, pain, and death. The passions being strongly fixed on the object of desire, prompts heroes to plan and execute those hardy enterprises which, till success has proved the propriety of them, appear ridiculous to the multitude. It is therefore during the age of passion that man is capable of the greatest efforts, both of virtue and genius, provided he has acquired a proper compass of learning. When the passions decline, often the power of mental acquisition diminishes also, and whatever superiority may afterwards appear in their works, it is no more than the application and display of the ideas acquired in the time of the effervescence of the passions, but which hitherto had not been reduced to practice.

The passions rouse the man of genius to energy, industry, and perseverance, to make effective use of the natural aptitude which he possesses. Although genius is not

merely a capacity for taking pains, yet it is necessary to take pains to develop its capacity. It is in the use of the innate gifts, and not the mere possession of them, that real greatness lies. Many men possess the necessary faculties, but they have not the impulses to use them industriously. Industry, when well directed, would make many men successful, but gifts, so-called, rarely have conferred greatness upon any. Of course, without the special gift, no labour or training will avail to produce the fine flower of genius, hence a person of genius in one line only of mental activity may notably not rise above—may, indeed, fall below—the average level of *general* intelligence.

The man of talent does what he has conscientiously learnt to do and others can be taught to do; although, having superior mental powers, he does easily and well that which they only do less easily and well. **The man of genius does that which nobody but himself can do.** His work is the essential and unique expression of himself, and he does it without being aware how he does it. He must be original; that is to say, he must have a constitutional dissatisfaction with things as they are, and an urgent impulse to get off the beaten tracks of thought and feeling in which ninety-nine persons out of a hundred go contentedly all their lives.

One of the differences between the man of genius and the average man lies in their totally different manner of receiving sense-impressions. Among the large number of sense-impressions that continually stream in upon us, our mind, influenced by our interest, makes a selection . the average man according to their practical importance, from a personal point of view; the genius looks at objects which interest him objectively, from a disinterested point of view, taking pleasure in the work for itself, not for its practical purpose.

The man of genius has a definite object in view. To achieve that object he must have exceptional natural ability coupled with such an environment as will give him the opportunity of expression. No matter what his talents, he cannot force his way, if he lives at the wrong time and in the wrong place. Genius must free itself of environmental restrictions. The very central idea of success is separation from the multitude of plain men, differentiation from the crowd. The average man flourishes and finds his ease in an atmosphere of peaceful routine. Men destined for success flourish and find their ease in an atmosphere of collision and disturbance. All great things have been won and given by those who would not conform; and in science, literature, and the arts it is not different. Where would astronomy be now if the great ones had not risked excommunication? Where would the Darwinian theory have been if its author had conformed to the views of the majority? Where would modern surgery now have stood but for Semmelweis, and Lister's disregard of the attitude of their opponents? The genius escapes from the routine in which his fellows live; his work is an innovation. But he often pays dearly for his boldness. As the history of philosophy and science shows, men are not grateful to the discoverer of such truths as tend to disturb existing notions. He is fortunate, indeed, if he escapes persecution, and he must be of a sound organisation if he is not to break down under the abuse and obloquy which are the portion of the preacher of a new gospel. The instinctive tendency of mankind is to resent any disturbance of its placid hold of traditional beliefs, and to muzzle or suppress the disturber. The pioneer is generally in a thankless position; often he is sowing the ground for others to reap.

Great men must make their opportunity. The greatest work in the world has been accomplished by men who have had to fight for opportunity in the face of opposition.

The most distinguished names in every age and country have been self-made. Some of the most illustrious men have sprung from a most obscure origin and often from stocks which the eugenists would eliminate as unfit and unsound. Of course, genius cannot prosper in the extremes of abject poverty, as little as it prospers in

the enervating environment of luxury. In the one his enthusiasm freezes, in the other it evaporates.

Progress everywhere depends on the few who are capable of creating novelties and *getting them accepted*. There are plenty of geniuses, but their work has not been "taken up," hence there is no reward for them. A poem may be full of the noblest inspiration, the most graceful diction; but it cannot shake the world without a publisher. A comedy may be equally witty and adroit; but it is "dead weed" until it is made convincing to a manager. An architect may design the most "lordly pleasure house," and an engineer the most serviceable bridge, but neither can fulfil its intention until the prosaic builder has been instructed to take the matter in hand. The musician sighs over his uninterpreted "score," his ambition is high, but the "production" of his opera involves a certain risk, a considerable expenditure. He must wait. The realisation of all these ideas depends, and must depend, on powers and opportunities outside their originators, and, as a rule, altogether beyond their control. Consequently other qualities are necessary, besides the inborn gift, namely, *character qualities*, to make the genius recognised. It is only in the works of genius pure and simple, as in art and poetry, and in literature generally, that recognition follows more easily. It is in these that we find a larger percentage of eminent men arising from humble rank than in any other path of achievement, for they do not require University training. The child of wealthy parents or of high social rank is frequently too far removed from nature. But poverty means enforced labour. Poverty tends to weaken that self-reliance which the consciousness of possessing property tends to strengthen.

There are people with whom the initial difficulty is the great one—people who cannot start themselves, but who, once started, run along merrily. I do not, however, believe that great talents have often been kept down for want of this early help. Provided a man possesses the necessary character qualities, he may be trusted to force his way against almost any obstacle. History shows that the majority of men who have achieved success of the first order in life have had no such good fortune at their birth.

The extraordinary industry of men of genius and their self-imposed hardships render their organisation highly vulnerable. Yet geniuses as a class are long-lived, as might be expected, for, to become eminent, people must generally live long. I refer, of course, to geniuses in the field of philosophy and science, and not in the arts. The latter come early to their season of mellow fruitfulness and often die young, like those whom the gods love.

Men of superior brain power—provided they can keep their emotions steady—are as a rule longer lived than ordinary men, notwithstanding the strain of intellectual life, to which is often added the unhygienic condition of a sedentary existence. Only such men of genius as poets, artists, and inventors are often short-lived; though even among them, Goethe, Michael Angelo, Titian, and others reached a good old age. It is the poverty in early youth, the early disappointment, lack of appreciation, irregular meals and insufficient diet, lack of sleep, and other hygienic errors which tend to shorten life in these cases. Statesmen, judges, clergymen, are generally long lived; but we must not overlook the fact that long life in itself adds to fame, the person so fortunate outliving his competitors and adversaries.

The prolonged application and energy of men of genius are signs of their sanity. The insane often have lucky inspirations, but not the perseverance to carry a work to its completion. If they do finish their task, they are certain to spoil their work before the end by the introduction of some insane idea. I have seen paintings spoiled by the *finishing* touches of an insane artist, and I have read poems of magnificence and essays of splendid composition but for their last sentences.

The genius is usually consistent in the one thing which makes him original, whether it be in the work which he does or which he proposes to do. A real genius does not produce his work because it brings wealth, fame, or happiness, but because he has the impulse to produce it whatever its consequences. Sometimes he has been stoned for it. Frequently it is adversity that spurs him on. If he is successful, it is not by "good luck," it is not by any occult occurrences, but by opportunities promptly utilised, a characteristic which shows his sanity.

Every illustrious man is the direct result of his ancestry, but we do not know the laws governing inheritance. **Natural ability consists of almost infinite complexities of brain power, and it is these complexities, not natural ability itself, which are the subject of inheritance.** Men of genius often make ill-advised marriages, and the offspring do not come up to their standard.

We have in genius—indeed, in exceptional ability of any kind—**one or more areas of the brain developed at the expense of other areas, and this undue bestowal of brain power in one direction is commonly attended by some deficiency in another.** More highly gifted than the majority of men in one respect, he is less well equipped than they in other functions and aptitudes, and not infrequently he suffers from some distressing physical affliction. We are all alike in this respect. None of us have all the capacities in equal strength; indeed, the character by which we are known to our friends is due to this predominance of certain qualities and deficiency of others.

The psychic centres of the brain are multiple and complex. They do not form in any person a homogeneous whole of which the parts are all uniformly developed. It is owing to this exaltation of the functions of one or more groups of brain-cells that genius is, as a rule, partial. Well balanced faculties do not generally lead to anything more than mediocrity

Genius has the vision of new ideas which outstrip the mental capacities of their contemporaries, and possesses the power of realising these ideas; in other words, genius is an inborn tendency to see and do certain things better than the rest of mankind. The genius is considered such when he develops ideas that are really of value. But there are many persons who have all his qualifications, except the one of being able to materialise their ideas. They lack the ability to do, as well as to contemplate. Such persons are prone to dream of revolutionising the race with their ideas, but they lack the power of practical execution, and their visions come to naught. In the pursuit of their extravagant plans they completely lose sight of the realities of life, keeping their gaze fixed only upon the results, while they never take into serious consideration the difficulties and insufficiencies of their methods. Yet they hold to their ideas, however unusual and absurd, till everything is coloured and distorted by them.

Genius represents to himself things as they ought to be, not as they are. Things as they are would not make him sacrifice himself. Genius proclaims a truth where others keep silent. He proclaims it because he has a high ideal of spiritual vision and is not like the average man, a mere gramophone record of existing dogmas and mass credulity. Viewed in this manner, genius may be considered abnormal; but not all abnormality is pathological, nor is every individual insane who differs from the mass of mankind in his way of thinking and conduct. We know from experience that genius and insanity often go together; but all men of genius are not insane. It is the frequency of eccentricity which has served in the minds of some writers as a reason for regarding genius as a morbid manifestation. We must not forget that trivial details in the lives of great men are recorded and made much of, and that the same symptoms in ordinary men would not be regarded as insanity. To a certain extent, of course, all men of genius are singular, and frequently they are given to unconventionalities of conduct. Circumstances in their lives may have tended to weaken their confidence in human nature, and they accordingly shun mankind and become peculiar in their ways. Their peculiarities and eccentricities

do not justify us in regarding them as mentally morbid. The same peculiarities and defects occur in the general population; but the ordinary man, if he has the least breeding, has been accustomed from his youth to control his expressions and conduct, while the man of genius is often too preoccupied to pay attention to the impression he is likely to convey to others by his manners. He appears what he really is, while the average man often dissembles.

The great majority of the human race is average. It is upon the medium type that nature relies upon the continuance of the species. Persons whose minds deviate in some one or more notable respects from the ordinary standard, but yet whose mental processes are not directly at variance with that standard, are said to be eccentric. Eccentricity is generally inherent in the individual or is gradually developed in him from the operation of unrecognised causes as he advances in years. If an original condition, it is often the result of early training emphasised by a special environment. These individuals are often mentally brilliant in some directions, but are handicapped by deficiency in those qualities which would aid them in the competition and struggle for existence.

It is not the exceptional capacity and its exceptional activity which causes insanity or any other breakdown in men of genius, but the deficiency and weakness of the other capacities and activities. Heredity is as much a factor with them as with ordinary people. Personal ease, health, comfort, or welfare do not enter into their calculation. If they fail in gaining recognition and go mad, it is their worry which has broken them, as it does daily other men. Some do lower their vitality by excessive work in unhygienic surroundings, others by the indulgence in drink and a dissipated life; others are by nature hyper-sensitive, and feel pleasures and sadness more keenly than ordinary men.

The genius is in the van of his age, but for this reason he need not be held mistaken, unpractical, or mad. If he agreed with his age, he would not be original. Indeed, the higher the level of the general average of ability, the higher the ability of the distinguished few. A Bacon is not honoured so much by his own age as by a posterity which has developed up to his level. Certain periods in history are more favourable to the rising of genius, for "the great man assimilates and recasts the material supplied him by his epoch"; but the same forces act upon the mass of his totally undistinguished countrymen.

There are literary, artistic, scientific, administrative, military, commercial, religious, philanthropic, and even criminal geniuses; but **if they do not belong to a tainted family, and do not indulge in excesses, they do not become insane any more than ordinary men** who are not defective from birth nor have led irregular lives. The fault is that most writers on the subject draw up an incomplete list of men of genius, and confine themselves chiefly to artists and poets, who form almost a class to themselves. They leave out of consideration a vast number of persons equally qualified to be considered. Artists and poets, oftener than others, lack balance and are subject to oddities, fixed ideas, prejudices, fancies, and sometimes moral perversions. But the disorderly life which was formerly indulged in by them in the fond belief that it was a help to their inspiration, is very rare now; hence they are saner. Genius is more common amongst artists and poets, because artistic and literary pursuits are open to men from humble rank, which is not the case to the same extent in other paths of achievement. Other pursuits require longer training, ampler means, and greater social influence. But just because these men are of humbler origin, it is questionable whether they are physically as sound as those of better birth. Another point deserving consideration is that artists and poets depend greatly for their originality on their power of imagination, and a vivid imagination is easily disturbed by ill-health and leads readily to deception of the senses; hence they are easily subject to hallucinations.

There is nothing extraordinary in the fact that the nervous organisation of men

of genius is very liable to break down. For theirs is a highly refined and complex organisation, and the price of refinement and complexity is instability. A fine and complex machine is more apt to go out of order than a crude and simple one ; but that does not prove that complexity and disorder are the same thing. Similarly, the more complex minds may be more liable to derangement than the simpler ones, but that does not prove that mental complexity and derangement are identical. It only proves what hardly stands in need of proof, that instability and heterogeneity tend to go hand in hand.

Neurosis develops in the man of genius as a consequence of his exceptional labour, much more than as the source of his genius. The brain of the thinker, working harder than all the other organs, appropriates a larger amount of nutriment, thereby impoverishing the rest of the organism and placing it in a condition of inferiority for contending against disease, particularly against those maladies which attack the nervous system.

Another reason for the liability of men of genius to insanity is their **great sensibility,** which implies a finer and more subtle delicacy of thought and feeling, which permits of a keener sympathy and a deeper, clearer insight into men and things than are granted to ordinary beings. That this constitutes a defect of often great consequences to the individual, as well as a quality of still greater import to the race, is sufficiently clear. Sensations and observations, which the ordinary man hardly notices, are transformed by them to great creations ; at the same time disappointed hopes, failures, and adversity are felt more keenly by them. Men of genius are, even with apparent outward good fortune, men who most deeply and irremediably feel the wretchedness of existence. Their ideals urge them to constant, painful, and often unsuccessful effort. The world will jarr on them, their efforts will provoke much friction and opposition, and they will be pained by many things in which a lower nature would placidly acquiesce.

Genius feels the lack of appreciation more deeply than do men of common clay. This feeling is too often justified by the knowledge of the neglect which has been the lot of so many men who have given themselves without stint and without hope of material reward to labour for the lightening of darkness in which we live. Many have been allowed to starve or spend their lives in hidden grooves, their poverty and obscurity being sometimes in strong contrast with the fame and wealth of others who have reaped where they have sown. The hardest thing for a scientific man to bear is the attribution of discoveries of his own to men who have come into the vineyard at the eleventh hour and received the reward of his labours. The history of science is full of examples of such injustice ; and it is not surprising that **melancholy is a most frequent accompaniment of genius.**

Insanity consists in a loss of control over thoughts and feelings. The difference between sanity and insanity is thus the degree of self-control exercised. Of course, none of us reach the ideal in mind and conduct. Nearly all the world is cracked, but some succeed in concealing the crack better than others. In insanity the personality of the afflicted person is altered, sometimes by an alteration of character contrasting with the ordinary healthy condition, sometimes by an exaggeration of the natural dispositions and predilections which have marked the individual when in health. Persistent retrospection or gloomy introspection, extreme sensitiveness, marked egotism, a feeling of unsettledness, a want of power of continuous application to the usual occupations, are symptoms which mark the oncoming of mental derangement.

As regards actually insane persons, they may produce works of great eminence, if their insanity affects their feelings but not their intellect, as, for example, in paranoia. Patients afflicted with this form of mental disease believe themselves persecuted. The geniuses one meets at lunatic asylums are generally of this kind.

Clever work may also be done, and has often been done, at the beginning of mania, during the stage of so-called hypomania, which is characterised by an

increased sense of well-being and an exaltation of all the faculties, so that the natural talents are stimulated and the ideas flow more freely than in the normal state. Some men suffer from a recurrent mania, and if the attacks be mild in their nature neither they nor their friends may suspect anything abnormal.

Whatever the explanation, it is certainly the case that the art of the lunatic asylum is practically confined to pictorial and literary expressions, and it is rare for the insane to seek in music an outlet. Insane literature consists generally of poetry. Relatively few lunatics, and as a rule those only whose mental integrity is but slightly impaired, make any attempt to produce work of literary pretensions in prose. Alike in literature and in painting, conventionality and traditionalism are the distinguishing features of the work of the insane. Originality is rare. This observation may bring some consolation to the Post-Impressionist and Futurist school of painters. Only in cases of delusional insanity is there ability, originality, or constructive power.

Speaking in general, the insane person almost invariably shows signs of mental derangement in more than one direction, and is unable to give long-sustained attention to any one subject. One faculty there is that plays an important part in the mental operations of both the genius and the lunatic, namely imagination. But the one makes use of this faculty for the accomplishment of the objects he has in view, while the other becomes its slave and is led hither and thither by its vagaries.

In taking other defects, such as gout, consumption, etc., it must not be forgotten that these diseases afflict all classes of men, not merely men in the highest ranks of intellect. If the brain be sound, contrary to the accepted notion, the body may be weak Frail men and women have performed some of the greatest deeds enrolled in the history of the race. They have done so on the stimulus of a great idea. Fired by some great passion or some suddenly roused interest, a comparatively weak individual can carry out an immensity of work impossible to physically stronger persons who are untouched by the spiritual forces which sway him.

If all the genius is tainted, then from the point of view of eugenics they ought never to have been born. Certainly they ought never to marry. But is there anyone who could positively assert that all his ancestors, aunts, uncles, great-uncles, etc., on the maternal and paternal side, were absolutely sound ?

The existence of mental defects, obliquity of mental vision, imperfect cerebral development, and marked defection of character, is scarcely compatible with the breadth of view, powerful imagination, and great intellectual strength of men in the very first rank of human genius.

CHAPTER XXXIV

THE APPLICATION OF ETHOLOGY TO THE STUDY OF INSANITY

THE study of the signs or mental derangement is of immense importance to mankind, inasmuch as it leads to the prevention of a disease which robs man of all his highest attainments. Insanity seldom comes like a thunderbolt out of a clear sky. The study of insanity clearly shows that it practically never develops in a day; but that, on the contrary, often weeks and months elapse until the deviation from normal mental health is noticed. Often some accidental circumstance, some apparently trivial event, may be the determining cause of the outbreak—the immediate precursor of the declared symptoms; but the conditions have been there before, and, as in the old adage, the new event was but as "the last straw" that made the burden intolerable. If the early history of the patient be only carefully investigated, it will be found that eccentric acts were performed long before the actual outbreak of the disease. Opinions may differ as to how wide may be the departure from normal to justify us in diagnosing insanity, but yet this is the beginning of the malady; the difference between this state and certifiable insanity —that is, insanity in the legal sense—is a quantitative difference, a difference of degree only.

Insanity exists long before the certifiable stage, but usually no notice is taken of it so long as the insane person does not seriously interfere with the social current. But when, for various reasons, he becomes troublesome, or commits an indiscretion which affects his own existence or which brings discredit on his family and friends, he may be declared "legally" insane and deprived of his liberty. What the law takes cognisance of is not whether the person is unsound in mind—in the medical sense—but whether the person is **insane in conduct** or likely to become so. About his thoughts and feelings it is not concerned in the least, so long as no harmful conduct is likely to arise from them. Whatever a person believes, thinks, or feels matters only in the medical estimation of insanity. In the legal sense it is of no consequence, so long as his conduct is not affected thereby. It is for what he says and the way he behaves that a person is certified as insane. It is the patient's lack of self-control and inability to adapt himself to his environment which is the criterion of admission to the asylum. Thus in such institutions we get those types of cases together which appear forbidding to the ignorant and to whom the antiquated term of "lunatic" is applied. It is no exaggeration to say that in a large number of cases the curable stages of insanity are passed by the time asylum physicians see the patient, and treatment before certification has hitherto been rendered difficult in England because of legal restrictions in the case of well-to-do patients and the absence of genuine mental "hospitals" for the poor. These defects are now to be remedied.

A patient may be certified whenever his conduct becomes unsafe to himself or to others. When the realm of conduct is invaded, then the disease becomes of social importance and can be certified as insanity. Thus, what was before medically

true, though legally denied, is admitted only when the preliminary and most curable stage has passed. It is the badly damaged brain that is sent to the asylum for safe keeping, but there are, in every stratum of society, large numbers of blemished brains that perform their functions irregularly and require repair.

There is no sharp demarcation between the medically and legally insane **There are no hard-and-fast lines separating sanity and insanity,** soundness and unsoundness of the mind; indeed, there is no sharp division between health and disease in general, disease being nothing more than an exaggeration, or disproportion, or inharmony of normal phenomena.

Whereas the general diagnosis of insanity, when once so pronounced as to necessitate certification, is in many cases so easy that it can be made by any layman, the early stages of mental unsoundness often demand all the science and skill of the most experienced observers. Even in the domain of physical disease, where exact physical means for diagnosis are at hand, it is often difficult to decide where health changes to disease. It is still much more difficult in the psychic domain, where a standard of mental health can only be thought of as ideal, where no individual is exactly like another, and variations of thought and feeling from the majority of mankind, and even errors of the understanding and illusions of the senses, are possible within the limits of physiological life.

In reference to the body, "feeling well" is the chief mark of health; most people who are sick know it. With the mind it is otherwise; here there is no connection between health and feeling well, and the patient is not in a condition to say whether he is well or not. Consciousness of derangement occurs, as a rule, only at the very beginning of insanity, and that only in some patients; and it occurs again just before recovery, when the knowledge of being mentally ill is one of the most marked symptoms of convalescence.

At the approach of insanity the unfortunate sufferer is often conscious of a gradual **loss of control** over his thoughts, feelings, and fears, but he conceals with the utmost jealousy from his relatives and friends the agony that is eating into his very soul. No doubt innumerable acts which puzzle and appear totally unaccountable to friends and strangers are the result of mental conflict hidden in the depths of the patient's mind. Persistent introspection or gloomy retrospection, excessive sensitiveness, marked egotism, a feeling of unsettledness, a want of power of continuous application to the usual occupations, are all characteristics not to be lightly regarded. A prolonged condition of want of conscious energy, when work ceases to be a pleasure, when there is "no go" in the man, is a symptom to be taken notice of. The opposite condition of causeless impulsive action and continuous output of energy without sufficient cause is also sometimes suspicious. In persons who have had normal or extra good manners when in health, it is a bad sign if the usual social observances and conventions become markedly irksome—and are departed from. Of course, none of us reach the ideal in mind and conduct, and some have marked peculiarities.

In the incipient stage of insanity the patient is sometimes fully sensible of entertaining exaggerated and unnatural impressions; he is acutely conscious of the mind dwelling morbidly and sometimes irresistibly upon certain trains of absurd, unhealthy, and it may be very impure thoughts; he painfully recognises the fact that insane conceptions are struggling to master his reason, obtain an ascendancy over his judgment, an abnormal influence and control over his passions, and the subjugation of his instincts.

The difference between sanity and insanity consists in the degree of self-control exercised. We all have, at some time or other, thoughts passing through our minds and feelings agitating us which, if they were expressed and indulged in, would be as wild and perhaps as frightful in their consequences as those of any madman. But the man of strong mind represses them and seeks fresh impressions from without,

if he finds that aid needful. The man of weak mind yields to them, meditates on them, indulges in them, and thus they acquire fresh force, until he is totally unable to free himself from the thought or subject that haunts him, and he is then insane.

The standard of sanity depends partly on the *environment*, which varies not only with every stage of civilisation and barbarism, but also with each social station and each grade or phase of education. What would be natural and commonplace in one state of society or in one community would be altogether aberrant and unusual in another, and this difference exists even in the same persons under various circumstances.

The standard of sanity depends also on the *standard of the individual*. Everyone thinks and acts in his own way, and thus there is formed a special standard of normality, which is made up of habits, social instincts, education, training, and more especially of those moral traits that constitute what we call character. In these respects the individual must be measured by the standard of his own personality—he must be tested by what he ought to be and by what he was in his normal condition—before an accurate decision can be arrived at in any case of suspected mental disorder.

Insanity may therefore be described as **a state of derangement, disease, or defect of the brain, causing a disordered action of the mind and putting the subject into a condition varying from his normal self and frequently out of relation to his environment.**

It is the brain which is at fault, that part of the nervous system upon the unimpaired condition of which the exercise of the understanding and the proper manifestation of the feelings and instinctive propensities depend. The brain itself may be diseased, or it may be affected indirectly; the blood with which it is supplied may be defective, or, since the brain is intimately connected with all the bodily organs, their disturbed condition may cause a reflex-irritation of the brain. In many cases the symptoms of insanity appear due merely to a functional disorder of the brain. Those insanities which are organic, like progressive paralysis, senile dementia, etc., are incurable, at all events at present.

Whether the brain is affected directly or indirectly, something has happened to hinder its normal function. The personality of the affected person is altered, sometimes by an *alteration* of character contrasting with the ordinary healthy condition, sometimes by an *exaggeration* of the natural dispositions and predilections which had marked the individual when in health.

When there is an alteration in the character, the change is generally in the direction of degradation. The kindly and forbearing man becomes irritable and quarrelsome; the refined and gentlemanly man consorts with people very much beneath him, regardless of their character; the prudent man launches out in wild speculations; the previously orderly and economical man becomes confused and prodigal; the precise man exhibits carelessness and negligence; the gay man is sullen and morose; and the modest, retiring man thrusts himself forward into all kinds of society, writes long and familiar letters to persons with whom he has only a bowing acquaintance, asking favours, offering benefits, and making appointments; the parsimonious man becomes lavish, and the generous man parsimonious. Often there are also aversion and antipathy towards persons who previously were regarded with respect and affection—a change so painful to those towards whom it is manifested that it is usually the earliest to be noticed.

When there is an exaggeration of the natural disposition, previous faults of character and of temper manifest themselves in greater intensity, over-sensitiveness passing into melancholia, suspicion into delusion, irritable temper into uncontrollable violence, weak volition into obsession, the talkative man monopolising the conversation more completely than usual, the uxorious man becoming even more demonstrative, the egotist bragging more audaciously, the querulous man complaining more bitterly, the naturally timid and reserved man shunning society and

isolating himself altogether from the companionship of his family and friends, the bold man becoming noisy and presuming, the courageous man becoming officious and talkative, and the strictly upright person exhibiting an unhealthy exaltation of conscience respecting his moral and social duties. Any peculiarity of conduct which is natural and not assumed becomes exaggerated.

There are thus two classes of insane—those whose character has undergone a change and those whose natural characteristic has become accentuated or exaggerated beyond control. Of course, it is not the temporary change, the temporary mood or exhibition of eccentricity, which constitutes insanity; for then those only would be considered to be sane who possess ordinary level minds. There are few among us who have not moments of depression or of abnormal excitements, fits of anger or fits of extravagance. **It is the prolonged departure, without any adequate external cause, from the state of feeling and mode of thinking usual to the individual when in health that is the true feature of disorder of the mind.**

In mental derangement the primary disorder usually consists in a tendency to **disordered emotional excitement,** which affects the course of thought and, consequently, of action without disordering the reasoning processes in any other way than by supplying them with wrong materials. Men seldom, if ever, go mad from intellectual activity, if it be unaccompanied by emotional agitation. We confine people as lunatics, not because their reasoning is unsound, but because the play of motive in their minds is too abnormal for us to rely on it. Thousands of people believe absurdly enough that they have been wrongly treated. That does not make us interfere with them, but when extravagant vindictiveness appears, when the individual goes about to shoot imaginary persecutors, he is classed among the insane, though his intellect may still be capable of profound or brilliant work.

In the earliest stage of insanity **no intellectual defect may be apparent.** The reasoning power may remain clear, the intellect as bright as ever, and in the course of a long conversation friends may not perceive the slightest cloud on the understanding. Or if there be any intellectual defect, it is displayed in the inability to recognise and realise the impropriety of the conduct. If one remonstrates or reasons with such a patient, one is astonished at the astuteness with which he justifies and accounts for his conduct. It is in actual brain degeneration, and not in any of the lighter forms of insanity, that the intellect shows permanent signs of weakening.

Through habit a faculty may become so powerful that we lack strength to control it; it controls us. All habits and powers, all passions and propensities, are liable to grow by exercise; every one of these irregularities may, by cultivation and indulgence, become strong enough to overcome the reason and cut off the means of correcting mistakes in judgment, and thereby establish insanity, at least in persons with an insane diathesis or temperament.

All the evil passions—anger, violent temper, hatred, malice, envy, and jealousy —are even more injurious to the balance of the mind than any of the intellectual disproportions. A man in a passion sees in the object of his anger those qualities, and only those, which he wants to see, and his imagination fills up the rest with such as correspond to his own state of feeling. He clothes his antagonist in a garb of his own creation, and then finds undoubted proof that he is wronged.

Some knowledge of the mind and character of man, of psychology and ethology, is absolutely necessary in order to describe accurately the phenomena of morbid mental states. Mental disorders, although they may be associated with the most serious complications affecting the intelligence, do not create new and special desires, but merely rekindle in an extraordinary way and inflame to pathological intensity the common passions of mankind, such as anger, fear, lust, etc.

The various primary mental powers have already been described in order of their evolution and examples have been given of their morbid activity in a state of disease. The disturbances of the primary instincts and emotions, and of perception,

memory, and the reasoning powers, have been shown. Illusions and hallucinations have also been dealt with, and it is only necessary to add a few remarks about delusions.

Delusions are frequent, but by no means absolute, signs of insanity. It would be a great mistake to recognise insanity only when delusions can be demonstrated. In the early stage of insanity the delusion may not yet have developed, or the patient may suffer from a form of mental disorder in which no delusions occur; or he may suppress his delusions, or, even though present, they may not reach his consciousness. The sane may entertain the most outlandish false ideas, and even in this respect surpass the insane. On the other hand, the delusion of an insane person need not necessarily contain an objective impossibility; indeed, the delusion itself may be objectively correct and at the same time have the value of a delusion. A delusion in an insane person is a symptom of a general abnormal condition and is related to other symptoms. The error of a sane person depends upon a defect of logical judgment or upon a false premise that has arisen out of uncertainty, carelessness, or embarrassment in the act of perception, such as superstition. A delusion of the insane is a symptom of brain disease, and therefore logic and reasoning are powerless against it. The sane person will see his error and correct it as soon as it is shown to him to be absurd.

The delusion of an insane person always has a subjective significance and an inner relation to his interests; that of a sane person appears only as an objective error. Thus, both may believe in witches: the sane person, however, as a result of superstition and ignorance; the insane person believes in them because he sees, feels, and believes himself threatened by them.

Whereas the well-balanced person would check an erroneous flow of thought by sound mental orientation, the insane—instead of trying to check the mental error by seeking for the proper explanation of perplexing facts as soon as the delusional construction is under way—reaches out for every fact, new or old, that falls within his knowledge, and contaminates it with a delusional and special significance to suit his primary conception.

The cause that gives rise to delusions is an imperfect adaptation of the individual to his surroundings. All delusions consist of fixed ideas, and vary only according to the individual culture of the patient; otherwise they are always alike, or, at least, they follow their course of development in exactly the same manner in the same individual.

Of course, delusions are also caused artificially by means of various drugs, intoxicants, or toxins of organic or infectious nature.

In infectious diseases or diseases due to auto-intoxication, the impure blood which circulates in the brain gives rise to a number of mental images and ideas which, while spurring on one another, are unsystematised. In the brain disease of the insane, on the contrary, although there, too, there may be infected blood circulating, the effect produced is totally different; in this case the ideas are in unison with the fundamental tendencies of the individual, and they dominate him as long as they exist. In brain disorder or disease the ideas always have an intimate bearing on the personality itself. The personality may be depressed, exalted or tortured by them, but they always bear the imprint of the personality, and this is explained by the fact that the cause which brings about the morbid changes does not come from outside, as is the case in fevers, intoxications, etc., but is the product of the brain itself.

A brain centre may be stimulated from within as well as from without; hence the sensation of voices in the insane, in others deceptions of sight, hallucinations of smell or taste, morbid fears or abnormal anger without adequate cause. These are sensations commonly complained of by the insane, and sometimes also by persons in sound mind; the only difference being that the former believe in the existence

of an external cause to excite their sensations, and that the latter perceive their morbid origin, and refuse to obey their impulses.

Both hallucinations and illusions, when believed in as real, give rise to false beliefs and delusions. The patient hears voices, yet he often fails to see anyone to whom he can refer them. Accordingly he assumes in his mad way that the walls are hollow, that the voice came through a telephone, or the like. Many patients hear voices insulting them, and are thereby led to form ideas of persecution. Or, again, they have visual hallucinations. Forms appear and disappear in a very different way from the forms of external objects really present to their senses. Yet they cannot help regarding them as dependent on real external events. So they hit on a way out of the difficulty by, for example, supposing that someone is working mirrors and so conjuring forms up before them.

Some delusions are simply the result of suggestion acting on exalted emotional conditions when judgment is in abeyance ; many originate in dreams or are conceived in the half-sleep or the dreamy states of consciousness of many forms of insanity, and afterwards, by reason of constant brooding, become fixed and enduring ; or they may be developed as a result of external impressions, as when a paragraph in a book or newspaper is misconstrued, and by a process of false reasoning twisted to suit the insane purpose of the individual.

In other cases they are simply the result of day-dreams of an ill-organised intellect. In still other cases they arise from excessive dwelling of the mind on single ideas and suspicions ; they take their start from an egotistic misinterpretation of facts, a sort of mental illusion. Whatever their origin, they are symptoms of defect of intellectual discrimination or judgment—that is, of a disordered intellect.

The most frequent delusional ideas of the insane are personal humiliation and degradation, remorse, physical alteration of the personality, ideas of grandeur, mystic ideas and ideas of suspicion. These delusions are generally fixed, and they invariably refer to the emotional side of the individual's personality, because they are entirely of subjective origin, and because their component ideas are not correctly regulated by conscious ideation of external origin.

Sometimes the conduct of others, wrongly interpreted, is the starting-point of the wrong belief. Sometimes bodily sensations cause the patient to build fals beliefs upon them. Sometimes the whole personality is in some way altered, b· the patient is unable to describe the alteration which he feels ; sometimes altered personality co-exists with the original personality, and the patient beli in a confused way, that there are two beings within his body, or that he has an self somewhere outside of himself. Sometimes the personality is actually ch and the patient has forgotten his past life and has changed to a man of t different character. Another variety is the patient who believes that he sessed by a stranger or intruder, who thinks his thoughts, speaks and acts fo. or that he is possessed by an inanimate object.

The delusions which refer to self are either **depressive**—accompanied by a f of misery—or **exalted**—accompanied by a feeling of happiness.

Patients may suffer from delusions of unworthiness and incompetence, accusatory delusions, delusions of sin and crime and vice on the one hand, a impotence and inability and incapacity on the other. Persons affected · delusions of this class abandon themselves to despair as sinners of the unpardon sin, or give themselves up to the police for crimes that they have not committed, confess to faults and vices of which they are wholly innocent or which they great exaggerate. They have brought themselves to ruin ; they have brought poverty and disgrace upon their families ; they have in some inexplicable way involved the whole village, the whole country, the whole human race, in ruin and disaster. There is no solace for them in this world and no hope in the next. These are the delusions occurring in that variety of insanity known as *melancholia*.

Or the patient may suffer from delusions of suspicion, persecution, and conspiracy. As he goes about the streets he thinks the people talk to each other about him, or look at him in a significant way; their attitude, their gestures, their very dress even, contain some occult quality which is intended to—and does—annoy and injure him. Sometimes it is a mysterious malign influence which is exercised over him. It may be by means of hypnotism, electricity, wireless telegraphy, or chemical vapours. This variety of delusions occurs in that form of insanity known as *paranoia*.

On the other hand, the false beliefs may take on an expansive character. The patient has delusions of exaggerated worthiness, competence or power, or the esteem in which he is held. The patient believes himself to be some exalted personage, or may think himself capable of great feats of bodily strength, of unprecedented mental vigour, of untold wealth, or marvellous inventive, artistic, or executive ability. Such delusions occur in *mania, general paralysis*, later stages of *paranoia*, and in *dementia præcox*.

As before stated, in the early stages a patient may suffer from insanity and yet have no delusions. He may be depressed, out of spirits—he cannot tell why. His business or even his amusements may be a nuisance to him. He may dislike seeing his friends, find even writing a letter a bore, and be irritable to those about him in a way he never was before. But as yet there are no distinct delusions. Conversely, a patient may display a state of exaltation and of change in this direction without delusion, as in *hypomania*. He may talk in an excited and rapid way, much more than is his wont. He may be inclined to speculations, may build new houses or buy things he does not want, be disposed to quarrel, and by no means willing to take advice. He may sleep but a short time, rising very early and expecting others to do the same, and his whole conduct may be foolish, often causing his friends a fear that he has been giving way to drink. But all the time there may be no delusion. The fact that a patient has delusions is, as a rule, an indication that his mental disturbance has existed for a certain time and proceeded to a considerable depth.

The faculty of **speech frequently becomes affected** in insanity. There may be increase in the rapidity of speech, from merely a rapid flow to actual incoherence, or the speech may be slow or stuttering; or there may be mutism, there may be inability to say certain words, or to put the right word in the right place; there may be silly, affected speech, baby talk, senseless jargon, and gibberish, or wearisome repetition of a word or a phrase, or difficulty in pronouncing words; or there may be punning speech. The unusual association of words, rhyming and punning, are among the symptoms often noted. As a rule, the insidious approaches of disease are foreshadowed by symptoms so trivial that they pass unobserved by patients and their friends.

There may be a slowness and difficulty in expression and answering, and a low-pitched, almost inaudible voice, as in *melancholia*, in consequence of the painful effort any mental operation causes to the patient. The tendency to silence is often very strongly marked in the acute stage of this disorder, and may be interrupted only by cries and ejaculations of a painful nature. Disconnected sentences and meaningless phrases are repeated in *inanition insanities*. Speech in monosyllables occurs sometimes in *dementia præcox*. The speech may be slow in consequence of the feebleness of the mental processes, as in *dementia*. It may be voluntarily restrained in order to conceal secrets, as in *paranoia*, or retarded in consequence of hypochondriacal ideas. There may be incessant talking in a high-pitched voice, as in *hypomania*, the patient allowing nobody else to speak. The speech may be flowing rapidly owing to the wealth of ideas, coming so quickly that the sentences remain unfinished; but speech can be also flowing with a scarcity of ideas, as is common in many sane people.

In connection with speech, it will be appropriate to mention the **handwriting** of the insane.

In general, it may be said that every one of the principal forms of mental disorder has certain peculiarities of writing and expression, and that the patient in his writings, when he feels less under observation, gives freer expression to himself, and thus betrays more than in conversation. This is especially true of patients who obstinately refuse to talk because of delusions and imperative voices which command them to be silent. It is also often astonishing that patients, who are quite rational in conversation, in their writings express the most irrational ideas. Writing that is rational does not exclude insanity any more than does rational speech. The writing of insane patients may reveal delusions otherwise concealed ; the style may enable a judgment of mental capabilities, and in its outward form permit a conclusion concerning the state of consciousness ; and the writing itself may be of importance in determining the existence of the slighter disturbance of co-ordination. In many cases the writing of insane patients is decidedly incomprehensible, as the result of employing words in a new sense, transposition of syllables, the addition of senseless syllables, or substitution of hieroglyphic and symbolic signs for letters. Words improperly written or the absence of words, the repetition of words or complete phrases several times, show disturbances of consciousness. In addition, while writing, the patient often forgets his real object, so that in the same letter he addresses himself indifferently in several languages, delivers the letter unfinished, and forgets to put the address, the date, or the signature. Further, the outer appearances of a letter, the paper, perhaps found in the sweepings and covered with blots, indicate clearly the great disturbance of consciousness. Since writing gives greater clearness of thought than does speech, it is a very fine test of mental weakness.

Imbeciles write the least. The childish formation of sentences, awkwardness and lack of clearness in diction indicate a high degree of mental weakness. *Melancholic* patients also write little. Here mental pain and inhibition are a hindrance. The monotony of thought reveals itself in the continuous repetition of the same complaints, fears and self-accusations. The writing does not flow in a stream ; it can be seen that the patient overcame his inhibition only spasmodically, and was able to express his thoughts only in fragments. Not infrequently the letters themselves are written with a trembling hand.

The *maniac* writes much and rapidly, with a firm, steady hand, in large letters. It is thus a true picture of his accelerated thought, which oftentimes the hand is unable to keep up with, so that words are left out and sentences remain incomplete. If the flight of ideas becomes greatly intensified, then the handwriting degenerates into an undecipherable chaos of words and sentences that run into each other. In his impulse to write, the patient writes in all directions on the paper, and does not trouble himself about the material which he may have at hand.

Paranoiacs, especially the querulous and erotic, are voluminous writers. Changes in their handwriting, consisting of curious eccentricities, curves, and the underlining of words and syllables, are noticeable. The diction may be faultless, bombastic, or curious, in accordance with the nature of the delusions and the state of consciousness. The content of the writings of paranoiacs is of great value, since it often reveals delusions which are carefully concealed in conversation.

The writing of patients of the *paralytic* group presents special peculiarities. The disturbance of co-ordination finds its graphic expression in handwriting that is indistinct or childish, zigzag or tremulous, and without distinction in shading.

In Chapters XXVI. and XXVII. the various mental powers as they are affected in the different forms of insanity have been described. The process will now be reversed and **the various brain disorders described as they affect the mental powers.**

PSYCHASTHENIA

Before dealing with insanity proper, the effects of *brain exhaustion* should be mentioned, as shown in *indecision* and *morbid fears*. In this state the patient is

painfully sensible of feeling mentally below par, and recognises his inability to use efficiently his mental powers. The power of attention is weakened, and the memory either wanders or is incoherent in its associations. The thoughts attach themselves to secondary points, and there is an inability to come to a decision. Hence the patient hesitates a long time over trifling details, and this irresolution renders him irritable to the slightest annoyance. His failures discourage him and present to his mind ideas of danger or of evil or fear. He feels powerless to resist the invasion of certain ideas that obtrude themselves upon his mind. Some of these ideas are harmless and meaningless, others are fretful to the individual and dangerous to other people ; they are recognised by the subject as unreasonable and morbid, yet he is unable to get rid of them. Particularly painful are the ideas of fear. The patient suffers from an uncontrollable dread, usually confined to a single object or class of objects : the fear of open places, of enclosed places, of crowded and solitary places, fear of lightning, of precipices, of the use of knives, of blood, of special diseases, of contact with certain animals, and so on. They cause the patient to live in a state of mental torture, for his will-power is not great enough to overcome them. These peculiar dreads and oppressions do not tincture the whole being, as the fixed ideas of the insane do. They are more or less arguable, more or less kept in their place by the judgment of the sufferer, who does not lose all sense of relative values. The will being not merely the power to do something, but also to leave something undone, lack of will-power, as in these sufferers, means loss of control over impulses. These impulses are frequently of an absurd character, such as particular movements, or impulses to touch things, but they may also be impulses to take things, when the patient will endeavour to check them, but is so full of " fear " of giving way, that he may suffer intolerable agony.

HYSTERIA

In the mental symptoms of *hysteria*, which affects women more than men, there is also defective will-power, morbid fears, want of self-control, and a tendency to impulsive actions, besides instability of the emotions and an irritability of temper.

Such patients crave for excitement, novelty, and the sensational, and their desire to attract attention and sympathy is so great that they exaggerate and even invent symptoms. Instability is the fundamental feature of the hysterical character. Inclinations, temper, and general feelings all change with incredible rapidity. Self-absorbed and selfish, everything must bend to their feelings and their views. They are untruthful and unreliable, unduly excitable, and far too easily influenced by their environment, yet their obstinacy in having their own way is extreme. Another characteristic is their constant tendency to mental abstraction, to absent-mindedness, which renders them very susceptible to suggestion and auto-suggestion. Sometimes they seem possessed of two or more personalities, being in one state conscious of certain experiences and living up to a certain character, while in another state they seem entirely different beings. A modern hypothesis of hysteria is that the disease is a mental disorder, the symptoms of which indicate what is going on in the subconscious mental life of the individual. Disagreeable events, feelings, emotions, and temptations of early childhood, which may have been discarded or repressed, nevertheless continue to influence unconsciously the mental life of the individual, until traced by a process of psychoanalysis, and frankly confessed.

Hysteria is regarded as due to dissociation ; the patient suffers from weakness of mental synthesis, the effect of painful emotional experiences. Certain parts of the mind, certain sensations, certain powers of movement, certain memories, are lost to the main consciousness, but still exist somewhere, in some form, and can be restored under appropriate conditions.

HYPOMANIA

A common, but unfortunately seldom recognised, form of insanity, the precursor of actual mania, is *hypomania*. In this condition there is a stimulation of all the faculties without confusion and a pleasurable feeling. The ideas are still sound but they flow rapidly, there is constant planning, ceaseless activity, extreme verbosity, increased emotionality, causing the patients to treat as friends mere chance and possibly undesirable acquaintances. The rapidity of their thoughts and actions does not allow them to finish the various subjects that they start, besides which they are constantly attracted by new ones. Self-esteem is prominent in these patients, and their own point of view, their own desires and projects, are the only ones they tolerate. They are the prey to their impulses, and, while the mood is commonly cheerful, and even exuberant, they become irritated on the slightest provocation, but their irascibility does not last. Frequently the memory is extraordinarily stimulated. They are often able to recall at will whole pages of poetry, to quote extensively from standard prose works, and to give dates and details of events, all of which would be impossible in the sane state. In their power of expressing ideas they manifest a wonderful facility, and their command of language seems inexhaustible. Not only so, but the choice of phrases and words, the flow of conversation adorned by jests, anecdotes, and pleasantries, varied according to their audience, shows a mental brilliancy which is more often than not quite unexpected and unlooked-for in the individual. The good spirits of the hypomaniac seem to be inexhaustible ; they make dangers invisible, life easy, and its struggle pleasant, with nothing but a certain triumph at its end. It was to such individuals perhaps that Dryden referred when he wrote :

> " There is a pleasure in being mad,
> Which none but madmen know."

In a little more advanced stage the patient manifests marked mental exaltation, which reveals itself in an increased tone of self-satisfaction and an exaggerated idea of self-importance. He propounds schemes and projects of an impracticable kind, abandons them quickly for other enterprises, unknown and foreign to his experience. Sometimes, however, patients in this condition have been usefully productive, have solved problems, and written even brilliant works. Usually their projects are not realisable and, if they have control over business affairs, financial losses or other catastrophes are brought about before insanity is recognised by their friends. On account of the loss of control over their baser instincts, the moral nature of this class of patients becomes perverted. They plunge into excesses, and squander money over drink and vice to the great distress of their families. Their natural affection for relatives is, except for selfish reasons, usually in abeyance, and their animosity towards them and others leads them often to foolish controversies, litigations, or criminal proceedings. Sometimes their insanity is ushered in by an attack of melancholic depression, and depression may follow the maniacal excitement.

MANIA

Mania proper is a more advanced state of mental excitement. The patient becomes more difficult to control, his conduct is boisterous, he sings, dances, shouts ; the flow of words, while facile, often amounts to mere repetition of one idea or of a single train of thought ; the attention wanders rapidly, ideas and speech become more and more incoherent. He is full of mischief, destroys things for destruction's sake, gets disorderly in his appearance, and frequently indecent in talk

and behaviour. Exaltation becomes very marked ; he imagines that he has become possessed of great mental ability, of extraordinary physical power, or of unusual riches. He is easily roused to anger and acts of violence, acts upon every idea and impulse that comes to him, and has to be restrained to prevent him from hurting himself and others. His activity, day and night, is inexhaustible. There is constant movement and loquacity, the patient is in a state of frenzy, which may last for days, weeks, or months. He may recover, or the state may become chronic and his brain powers get gradually exhausted, leaving him in a condition known as *secondary dementia*, reduced to a level beneath that of the beasts of the field.

In acute mania, the expression of the face is one of rage, the eyebrows corrugated, the eyeballs staring and protruding, and the face flushed. The whole body is in a state of intense excitement, and the patient gesticulates wildly in a threatening and aggressive manner. He tears his clothes to tatters and smashes in pieces whatever comes in his way. Whoever touches the patient is abused or struck by him. Irascible insanity is marked by excessive destructive violence and utter disregard of personal danger. The anger and violence are manifested in their greatest intensity by shrieking, roaring, raging, and abusive utterances.

A man in a state of acute mania may commit murder. There is no motive for the act, nor is it the effect of hallucination ; the explosion of mania manifesting itself in one act of violence, and the immediate return of reason after the act is accomplished ; he may be perfectly calm after the act, and feel no regret for it. There is either no consciousness during the act, so that there is no recollection afterwards ; or, certainly, it is not the same consciousness. There is no preparation before the act, or only rarely so ; but snatching whatever comes to hand, or happens to be within easy reach at that time and place, the deed is done with it. Moreover, the ordinary sane criminal, having a definite purpose, accomplishes that and is then satisfied ; but the homicidal maniac has only one purpose—to destroy ; he is not satisfied with merely killing ; he goes beyond : though the victim whose throat is cut may be dead already, the maniac will give him another stab in the heart or a blow on the head, or sever the head and fling it out of the window.

MELANCHOLIA

In *melancholia* there is excessive and unreasonable apprehensive depression, vague feelings of anxiety, mental pain, with complete insight into the condition. The patient seeks for a reason, and generally fastens upon some misfortune or some omission, or some wickedness of his, as the originating cause, but his depression is quite disproportionate in its degree and duration to the apparent cause with which it is connected. He is totally unable to divert his thought, his will gets paralysed, and he may become so inactive that he will not move unless obliged to do so. Nothing interests him, amusements are a nuisance to him, he wants to be left alone and brood over his misery, but his thoughts run slowly. Later, as his apathy grows, the patient becomes untidy in his habits and completely inert. The intellect remains intact, only inhibited. He may not speak, unless in answer to questions, when he will reply slowly, but sometimes he turns mute. His feelings are paralysed as well. He is indifferent to everybody and everything, finally even the bodily processes become delayed. Such is the uncomplicated condition of melancholia, the exact counterpart of mania. There is no delusion as yet, but the patient, who has always been conscientious, is given to self-accusations, exaggerating the nature and consequences of errors he has committed, but which in his normal state he rarely, if ever, thought of. He weeps, sobs, wrings his hands, groans, sighs, and laments in most sorrowful accents the cruel fate which has come upon him. He wishes he were dead, and has to be constantly guarded to prevent him from committing suicide.

Later delusions will develop ; they are always of a painful nature, generally of culpability. Everything is wrong with him, he has wronged everybody, his soul is lost, his punishment has already begun upon earth. Sometimes there are also fears of impending evil, causing him great agitation. Illusions and hallucinations make their appearance, fear-inspiring objects and characters pass before him, or voices command him to kill himself or others, or he imagines his food is poisoned and refuses to eat. He may now become agitated with fear, tearing his clothes or his hair, striking his head, shouting, " I am damned ! " " I am lost ! " His movements are monotonous and restricted, often rhythmical, quite unlike those of the maniac. Owing to the delay and irregularity of the functions of the body, delusions about them are not uncommon. The patient thinks himself afflicted with some serious disease, or to be drying up or mortifying, hollow, or obstructed. In contrast to the agitated melancholiac, some patients become immobile from fear, fixed in a state of stupor, like a wax figure, neither speaking nor moving a single muscle of the body.

PARANOIA

Paranoia is a chronic mental affection, characterised by delusions of *mistrust*, working on a tainted constitution, which tend to become fixed and systematised, and in which various hallucinations are common. As a rule the disease is seen in persons who are bright and clever, and *suspiciousness* is its characteristic. The patient may have always been moody and introspective and begin his complaint by believing himself of interest to other people. He thus misinterprets their looks and actions as having reference to himself. Outside this belief, the patient may be clear mentally and even brilliant. In consequence of his cleverness, he is often, in his own estimation, an under-rated genius. Frequently he is an innovator or inventor, philosopher or reformer, but without the capacity of carrying his creations to a practical conclusion. His want of success may increase his suspicion. He becomes extremely sensitive regarding the motives of other people, even their kindness is misinterpreted, and silence is an offence. In reviewing his past life, he gives a false interpretation to many events. Gradually his delusion becomes more definite, and he accuses certain persons of ill-will against him. Hallucinations of hearing may now commence, voices abuse and insult him, constantly disturb him. Gradually he comes to believe that he is the victim of a conspiracy on the part of some public bodies, or secret societies, or even of supernatural agencies. Sometimes his suspicions are directed against a particular person, who does not perceive that he is in danger of being a victim of revenge. Later, hallucinations of taste and smell may cause the patient to think that attempts are being made to poison his food ; or that noxious vapours are injected into his bedroom, so that he carefully stuffs all the keyholes of the doors and any other opening. There may be also hallucinations of general sensibility, which he attributes to electricity, magnetism, wireless telegraphy, hypnotism, or other physical or spiritualistic agency. It is exceedingly rare for the patient to see his persecutors, and for his hallucinations or delusions to take an agreeable form, even temporarily. The irritation may give rise to attacks of excitement, he may attack some innocent person, or else fly for protection to the police, when his insanity is likely to be recognised. Sometimes he tries to get right away from the taunts of his imaginary persecutors and will be free for a time, but soon his suspicions are again aroused : his enemies have followed him. To be the victim of so much persecution, the patient reasons, he must be some important person ; he feels happier now in a delirium of an ambitious nature. Perhaps he is exceptionally gifted, of an exalted position, of great wealth, or a world-saviour, or a prophet, or Providence has some special mission for him. He may now have magnificent visions, and, whatever his false beliefs, they are woven into a plausible system. Occasionally he is in love with

a lady far above him in social position ; sometimes it is only an imaginary person ; at other times he pursues some exalted woman with his attention until she seeks the protection of the law from the stranger. Although his grandiose ideas are absurd, he has always good reasons for them. Gradually his mind weakens, but he still retains the power of conversing in a rational manner on various subjects outside his delusions.

Many people who go through life as eccentric—especially reformers, political enthusiasts, and revolutionaries of society—are possibly only aborted cases of paranoia in whom the progress was checked in the early stage, and modified into a sort of crankiness and eccentricity, not pronounced enough for them to be commonly reckoned insane, but sufficient to make them noticeable as odd in behaviour and generally peculiar. They learn, however, to control their conduct and conceal their feelings to a very large extent, so that their real mental condition is not betrayed, except by some habit of writing or speech when they are off their guard.

There are many people in the world who have grievances real and imaginary, and strong over-self-appreciation, yet who are not insane. Many genuine inventors, philosophers, artists, poets, and others, placed in unfavourable circumstances, may have been robbed of the fruits of their works by some unscrupulous person, or else may have failed to attract attention, and, in consequence, formed an unfavourable or delusionary view of the world, against which they take an antagonistic standpoint in consequence of their misfortune. Even the idea of conspiracy may not be totally unfounded, or at least an unreasonable suspicion. How often is an inventor or discoverer, who is more outspoken than is agreeable to established cliques, boycotted by the official authorities and journals ? His opponents might say that he overestimates his own importance, or deny that there is any such organised obstruction to the recognition of his work, and so the man might be held to be labouring under a delusion, whereas, on the contrary, he may have a sounder and clearer brain than his critics, to hold his own in the face of adverse circumstances, as is often shown when success ultimately comes to him. But if he should be unable to hold out, and should find death preferable to the prolonged battle against organised deceit and hypocrisy, the verdict would be that he was insane. On the other hand, since only the highest quality of nervous structure is capable of the finest work, a man who has suffered in the manner described may really break down and then exaggerate his own worth and his grievances to such an extent that he becomes mentally deranged. It is only when the delusions are so extravagant that their absurdity would at once be gauged by persons of ordinary intelligence that we are justified in presuming insanity.

The predominant feature in mania of persecution and that systematised form of it called " paranoia " is the lack of equilibrium between the intellectual operations on the one hand, and the emotions and propensities on the other. A paranoiac is often remarkable for his shrewdness and argumentative power ; he may be a scientist, a notable lawyer, a great artist, a mathematician, politician, or skilled administrator. His defects are of a moral nature, inasmuch as his emotion and propensities furnish a false basis for his reasoning, and thus cause his brilliant faculties to be at the service of a bad cause—of the instincts and appetites, which, owing to the disharmony, lead to very extravagant and dangerous acts. That the systematised delusion of persecution is not due to an intellectual enfeeblement is shown by the fact that it rarely leads to dementia.

Persecutory ideas are numerous and varied. Electrical influences, telephonic communications, invisible agencies of all kinds abound ; annoyance and tormenting by spirits, magnetising dust, vile odours, poison in the food are constantly met. The paranoiac is often regarded as a mere crank ; but from a medico-legal point of view paranoia is of great importance, because those suffering from it commit a large proportion of the acts of violence and homicide committed by the insane at large

and in hospitals. A number of cases have already been quoted (Chapters XXXI. and XXXII.) which ended in homicidal attacks from definite motives, in which the patient acted with reflection and determination, such cases being important in medico-legal inquiries.

Although the patient suffering from delusions of suspicion and persecution may become violent, he can be distinguished from the patient suffering from acute mania by the state of his reasoning faculties. The former preserves his shrewdness and argumentative power for an extraordinary time, retains his memory, and it is possible to converse with him for a long time without suspecting that there is anything wrong with him. This is in strong contrast to the disorder of thought presented to us even in the mildest cases of mania.

Hallucinations of hearing giving rise to delusions of persecution often lead to apparent suicide ; but this is not the same as suicide arising from melancholia. In the latter the patient thinks life no longer worth living ; he contemplates death and may prepare for it. In the former, the patient need not reflect on death at all ; he simply tries to escape from his persecutors. If he happens to be on level ground, no harm need follow ; if he is on a fifth-floor corridor and he can get out at the window, he may make an attempt to do so, with the inevitable consequences ; but it cannot be said that he is conscious of the fatal result, nor that he seeks it.

The illness may commence with the hearing of noises. These noises give rise to impressions varying from mere conscious illusions to hallucinations under the patient's control, and from hallucinations to dominant delusions, which finally become organised. These noises produce at first a disquieting effect, then they may give rise to ideas in the patient that his friends or neighbours have some ill-feeling against him ; then the patient may hear decided voices different from tinnitus aurium, inasmuch as definite words, sentences, or phrases are heard, until the patient believes himself persecuted, and even holds conversation with imaginary persons, whose abusive talk molests him. Sometimes the voices heard are of an imperative nature, which the patient, when exhausted from the long-standing worry and anxiety, cannot resist.

The delusions are not attributable to perversions of the reasoning process, but arise out of the perverted emotional state. This gives rise to misinterpretations of actual occurrences in accordance with the prevalent state of the feelings. When the disorder has lasted some time, and the false ideas are habitually dwelt upon, they become realities to the consciousness of the individual.

Mania of persecution can be distinguished from melancholia by the following characteristics :

(1) The persecuted are proud or vain ; the melancholic are humble.

(2) The persecuted are active ; the melancholic is passive, except in "agitated melancholia." The melancholic still preserves the general characteristics of melancholia, though he may think that someone is trying to poison him, and that his misfortunes are due to the evil work of others ; whereas the paranoiac is quite a normal man except for the delusion of persecution.

(3) The persecuted have the feeling of health and suffer only because they are made to suffer ; the melancholics, on the contrary, have a profound feeling of uneasiness, of physical and moral suffering, and are even so miserable as to be tired of life.

(4) The persecuted become persecutors, threatening and homicidal ; whereas the melancholic tend to suicide.

(5) The persecuted accuse others of making them suffer, defend themselves, and think only of strife and revenge ; whereas the melancholic accuse themselves of imaginary crimes, or believe themselves falsely accused of crimes which they have not committed.

(6) The persecuted are continually occupied with the past or present, and in most cases go back very far into the past to find evils which others have inflicted

upon them. The melancholic, on the contrary, occupy themselves but little with the past or present, but they have a constant dread of the future, and of all kinds of misfortunes which are going to happen either to themselves or to their families.

(7) The persecuted often tend to delusions of grandeur, and the melancholic to delusions of negation.

GENERAL PARALYSIS

General Paralysis (Dementia Paralytica) is a very common disease of the brain and nervous system, occurring during the active periods of life, characterised on its psychic side by a usually marked and generally progressive dementia, ordinarily attended with an expansive emotional condition. Unlike most mental disorders, it is accompanied by gross changes in the brain, chiefly in the frontal region, producing mental and physical degeneration, and ultimately death. At its onset it is marked by a general state of exhilaration. No one, in his own opinion, was ever in a better state of health than he ; no one more successful in business, no one happier than he. He contracts friendships with persons whom he would have avoided before his illness ; he makes investments such as no prudent man would make, or throws away his money on useless objects. At home he is irritable and whimsical ; his likes and dislikes are changed without adequate reason, and he either eats and drinks voraciously or declares that nothing is cooked to suit him and rises from the table in a rage. At times he sheds tears over the veriest trifles, and often for no reason that he can allege. Sometimes a sudden outbreak of violence may be the first definite indication of aberration, but the budding paralytic is rarely vindictive. Although easily roused to anger, he is easily calmed. Being in his own estimation superior to everyone, he can afford to pity and forgive. But of all the prodromata, failure and decay of the moral sense are the most important, and are exemplified by acts of omission and commission against law, order, and propriety. He may perpetrate frauds of various kinds or pilfer whatever he can lay hands on, and without adopting the means of precaution which the common thief would use to prevent discovery. Moreover, the articles he steals are not in general of any use to him, and are thrown aside as soon as he has them in his possession. The idea of propriety in the everyday affairs of life seems to be lost, and the patient will commit all kinds of indecent and obscene acts under circumstances which are almost certain to result in detection and without appearing to be aware that he is doing anything unusual. He becomes regardless of his personal appearance, and may appear in public half-dressed. His sexual excitement may result in rape and acts of indecency. He refers to all his past doings and future achievements in exaggerated language, devoid of all truth, and forgets from one day to another his ordinary duties and appointments, which leads to inconsistent acts and neglect of family affairs. With the increase of physical weakness, the mental weakness also becomes more pronounced. The patient will make astounding claims of being a king, a famous general, or person of renown. He is stronger than Hercules, literally able to move mountains ; he can build bridges to the moon ; he has a million horses ; can make diamonds by the bucketful. These exaggerations sometimes continue until speech becomes unintelligible and the patient is too weak to feed himself. His emotions are equally unstable, and he can be easily made to laugh or cry. Attacks of violent mania may set in, ending in complete dementia and death.

DEMENTIA PRÆCOX

Dementia Præcox is a premature mental weakness, in which the early life of the patient presents nothing abnormal, some individuals, indeed, showing promise of quite exceptional mental ability, yet who, as they approach adolescence, manifest

intellectual arrest, with insane and sometimes alarming conduct, followed by permanent mental arrest. Most of them have a defective heredity and manifest a tendency to keep by themselves, or to be over-religious, or to indulge in day-dreaming and immature philosophising. It is a disorder which affects better educated and highly-strung youths between sixteen and twenty-two years of age chiefly. The first chief sign in such cases is an inability to perform the usual work or mental tasks with the same correctness or facility as formerly. There is a lack of application and a general inefficiency. Although there may be no apparent lack of endeavour or industry, there is a defect in attention and concentration, with mental powerlessness. All volition is interrupted, remittent, or spasmodic; yet their comprehension is preserved. Another characteristic is an unimpaired memory. The memory of past events, especially of school knowledge, may be surprisingly good, even when the patient is very much deteriorated. But while there is the recollection of knowledge previously acquired, there is a curious weakness of judgment and loss of interest. The patients are silly, often constrained and affected in manner. They express many absurd ideas, chiefly of a sexual and a religious nature. Their beliefs are likely to be mystical; they are inclined to attribute their morbid sensations and experiences to the influences of others who affect them in some occult way. There is also from time to time a tendency to fits of depression and despondency, or to uncontrollable excitement, or to argumentativeness or irritability. There may be delusions of persecution, but they do not excite them as in the case of the paranoiac. It is the mental weakness that is the characteristic symptom, and the delusions, if any, are secondary only. The patients often get self-absorbed, unconcerned; apparently feeling neither joy nor sorrow, they often stare for hours into vacancy, wholly occupied with the hallucinations that are so prominent an accompaniment of this disease. Silly laughter without any appreciable cause is frequent. Periods of unprovoked anger and destructiveness are common. The patients appear to be aware of their mental disturbance and incapacity, but no regret, no care or fear for the future, for a moment disturbs their serenity. They become indifferent, stupid, foolish, and improvident. The course of this affection may be arrested, but it always leaves behind it a permanent degree of mental incapacity. Many blasted careers, blighted prospects, and inexplicable life failures result from this disease. Large numbers of beggars and tramps, drunkards, prostitutes, and criminals in one stratum of society, and of eccentrics and borderland cases in other social strata, are the victims of dementia præcox.

DEMENTIA

Dementia is a permanent state of mental enfeeblement—that final wreckage of mind which permits no opportunity of salvage. When it occurs in an individual previously sane, it is called *primary;* when it is the result of preceding insanity, it is called *secondary.*

In *primary dementia,* the higher mental faculties, those which are added latest in the scale of civilisation as the result of refinement and education, are the first to deteriorate. Soon all the intellectual powers are degraded. Attention is enfeebled, memory is impaired or even destroyed, and in consequence judgment is incompetent and the controlling power over the emotions is weakened. Dates, places, words, events, are forgotten. Even in the simplest matters the patient cannot arrive at a determination. Indeed, he does not make the attempt. Once the disease is well established, the patient becomes incoherent. Laughter may be indulged in at things sorrowful, and profuse tears shed on some ridiculous occurrence. Mental ruin and often moral degradation are very marked; the proprieties and decencies of life are neglected. Frequently there is a persistent attitude or habit of posture.

SENILE DEMENTIA

Senile Dementia occurs in those hereditarily predisposed or the subjects of arterial disease. Of course, a certain degree of decay of the mental powers is a natural consequence of advanced age, and, within certain limits, is a normal change. With the majority this amounts only to the loss of a certain power of mental assimilation for the events of the day, with a constant reversion to those of youth and early middle life, which stand out in very clear perspective. To these infirmities are added a certain degree of forgetfulness and a loss of the power of logical constructiveness. The character becomes simplified ; there are some who lose in virtue, and there are others who only lose some faults. Those, however, who are to become subjects of dementia, show a much greater degree of loss of memory, to an extent to cause confusion about time and surroundings. There is a want of understanding of the general situation, a vacuous cheerfulness, delusions associated with a certain sense of illness, and, above all, a profound failure of attention to present impressions. Often there is a complete change of character and a lack of carefulness and tidiness in regard to personal appearance and habits, with finally a complete disregard of propriety and decency, the same as in other forms of advanced dementia. The patient's mind becomes centred upon himself alone, his comforts and his ailments, and events that do not directly concern himself, in his eyes, are of no consequence. Silly mirth and tearful depression, mingled with increasing complaints of the lack of attention received, are also symptoms. Frequently there is excitement or perversion of the sexual impulse. Most often the patient becomes deeply melancholic ; mania is rarer, and seldom severe. If there are any delusions, they are generally those of persecution, the outcome of mistrust and suspicion, frequently concerning the patient's own family, leading sometimes to disinheritance of children. Often designing people gain undue influence over them.

ALCOHOLIC INSANITY

In quite small quantities alcohol acts first of all as a temporary stimulant, putting the person in an agreeable frame of mind, firing his imagination, and giving vivacity to his conversation. In a slightly larger quantity, it quietens the mind and conscience, and acts as a sedative to the feelings. In still larger quantities it produces loss of sensibility, making the person insensible to blows or injuries. The general expression becomes one of silly self-satisfaction, the ideas become crowded and confused, opinions are expressed freely and, from lack of inhibition, the emotions also are given vent to, and become unstable. Joy, anger, silly sentimentalism and melancholy may follow each other ; finally there is complete lethargy. Excess may produce *acute alcoholism* (delirium tremens), when visual hallucinations of moving terror-inspiring creatures and objects occur ; sometimes also hallucinations of hearing, and frequently perversions of nervous sensation of the skin and muscles, which are attributed to mysterious agencies, and are mostly of a persecutory type. Similarly there may be disagreeable hallucinations of smell and taste. Consciousness and memory remain intact. In *chronic alcoholic insanity* there is gradual and progressive mental deterioration with marked enfeeblement of memory and will ; and the moral character undergoes serious changes, bringing ruin on himself and his family. Outbreaks of passionate violence are common, and most characteristic of all, a mania of persecution and delusions referring to sexual relations and poisoning. Some preserve their manner with strangers, but in their family life manifest irritability, suspicion, and jealousy, misinterpreting the simplest facts. Finally alcoholic mania with motiveless violence may result.

DRUG INTOXICATION

In *Opium Intoxication* there is also at first a pleasurable excitation, a condition of beatitude in a semi-somnolent state. On larger doses hallucinations of sight, mental distress and a mild form of delirium occur, followed by peculiar sensations in different parts of the body and great prostration. Since ever-increasing doses are necessary to produce exhilaration, the intellect and emotions become impaired. The moral nature undergoes grave changes, and ethical obliquity, irritability, peevishness, anxiety, and moroseness follow. If insanity does occur, it is characterised by delusions of persecution or grandeur.

In *Cocaine Intoxication* there is a deplorably weakened will, a steadily failing memory, loquaciousness, and a tendency to write long letters or articles, and a proneness to advance impracticable schemes. Elation and depression frequently alternate, suspicion develops, and the patients grow callous to all obligations and ties. In chronic cases, hallucinations become distressing, giving rise to increased suspicion and suffering, and delusions of being murdered or otherwise foully dealt with. Insane jealousy is another prominent symptom.

MENTAL DISORDERS IN PREGNANCY

occur commonly only in those with some very distinct neurosis, and are as a rule of a more or less melancholic type, with loss of mental power, of will and energy. There may be dislike or distrust of the husband and aversion to the other children. There may be complete apathy and loss of interest in family and surroundings, weariness of life, delusions of having committed unpardonable sins. Mania is rarer, and generally the patient recovers after delivery.

INSANITY FOLLOWING CHILDBIRTH

(puerperal insanity) is due to septic intoxication and the symptoms are of the hallucinatory-confusional types. Suicide may occur as a direct consequence of frightful hallucinations and infanticide is not uncommon. The excitement is often intense, the speech is reduced to disjointed, unconnected words, and, when spoken to, the woman either pays no attention or stares at the person addressing her in a blind, uncomprehending way.

INSANITY OF THE LACTATIONAL PERIOD

begins after the second month after parturition. It also belongs to the type of inanition insanity, only that the hallucinatory maniacal form is the more frequent. There is loss of memory, morbid fancies, and a change of disposition toward the infant and the household. Under the influence of terrifying hallucinations the patient may do harm to herself or her child. A period of quiet or stupor, or delusions of a persecutory type, may follow.

MENTAL DISORDERS OF THE CLIMACTERIUM,

or "change of life," are not uncommon, when the erotic passion may flare up before its total extinction and silly love-delusions may make the patient the laughing-stock of her friends. Others think themselves neglected by their husbands, or a feeling of antipathy may arise. The woman becomes suspicious and sees evidence of unfaithfulness in the merest trifles. During this stage of insane jealousy, acts of

violence and destruction are common, and frequently libellous letters are written, causing public scandal.

EPILEPTIC INSANITY

may occur in patients suffering from that disease. Weak-mindedness is commoner than mental aberrations. But often these patients have unfounded aversions, think themselves ill-treated, are excessively religious, fanatics in political opinions, though their intellectual stock-in-trade is very limited. The two most prominent features are irritability and impulsiveness. Real epileptic insanity shows itself in exalted or maniacal conditions, or else in depression and fault-finding. There may be hallucinations, agreeable or disagreeable, ecstatic visions, and explosive violence. In the psychic type of epilepsy there is clouded consciousness, when various acts may be committed automatically, with complete forgetfulness after the attack. When a real mental disorder develops, there is marked impairment of intelligence, emotional instability, hallucinations of sight and hearing are frequent, also religious ecstasy, and delusions of persecutions. The epileptic furor is the most marked characteristic, with fierce vindictiveness, caused sometimes by terrifying delusion or hallucination. If a man has been subject to regular epileptic fits, and commits a homicidal act in an impulsive or motiveless manner, the presumption is very strong that the murder is a symptom of his disease, and that he is not fully responsible for his actions. (For cases of operative cure, see Chapter XXVII.)

TREATMENT OF MENTAL DISORDERS

The achievements of the last half-century have been the **recognition of the pathological nature of insanity** and the charitable purpose to separate the insane from other defectives and place them in sanitary dwellings under medical care. Of recent years it has become more and more acknowledged that the majority of the patients in asylums—though we call these institutions now "mental hospitals"—are chronic cases, and that their dominating purpose is that of custodial care rather than treatment, which, for the purpose of cure, would have to start in the pre-certifiable stage; for which purpose it is proposed to establish clinics and reception-houses, where the earliest changes in mind and character can be diagnosed and treated by properly qualified psychologists, and scientific investigation undertaken into the nature of mental disorders and their pathology. On the Continent such clinics and reception-houses have existed for some time.

In one fundamental fact no progress has been made. **It is still held,** as in Gall's time, **that all kinds of mental functions involve the whole brain,** and therefore, no matter of what nature the mental disorder, it is the entire brain, and not any one part of it, that is affected. No matter whether a person be melancholic, violently maniacal, homicidal, or suffer from delusions of persecution, whether he be a kleptomaniac, a religious maniac, or fancy himself a millionaire—in every case it is assumed that the whole brain is affected; whereas the evidence produced in this work supports the view that the fundamental dispositions originate in particular localities, and their disorders, at all events in the early stages, are amenable to treatment. It is only when left to pursue their course that they affect other parts and ultimately the entire brain. It is therefore not surprising that post-mortem examination of asylum cases does not favour the localisation theory. But, excluding mental disorders caused by toxins and derangements in the blood circulation, it must be admitted that the disease must have started somewhere. There is not a patient who has not some portion of his mental constitution still sound when certified, and often there is a change only in one or other of the primary emotions, and only one or no delusion.

We never see a complete lunatic, and however old-standing the disease, a careful investigation of the history of the case may lead to the discovery of the focus of the primary lesion. The cases cited in Chapters XXIX-XXXII. show depressed bone, splinters from the inner table, osteophites, weakened bone from circumscribed inflammation, hæmorrhage, cysts of hæmorrhagic origin, foreign bodies within the cranium (bullets, shell-splinters, etc.), tumours, adhesions from circumscribed meningitis, etc. All these are conditions which would warrant surgical interference.

Certainly **in every case of insanity in which there is a history of head injury and the locality injured corresponds with the locality indicated by the symptoms,** as described in this work, **operation should positively be undertaken,** even if there be no external sign of trauma, such as a scar, or depression of bone, and although there is no local tenderness or fixed headache. The length of time that elapsed between the accident and the onset of the symptoms apparently need not be considered.

J. CHRISTIAN ("Archives de Neurologie," vol. xviii.), analysing 100 cases of traumatic insanity, found that :

In	54	cases	the	interval	was	from	1- 5 years.
,,	21	,,	,,	,,	,,	,,	5-10 ,,
,,	11	,,	,,	,,	,,	,,	10-20 ,,
,,	7	,,	,,	,,	,,	,,	20-30 ,,
,,	7	,,	,,	,,	,,	more than	30 ,,

H. A. POWELL found that in 47 of the cases in which the interval is stated, the symptoms appeared :

In	8	cases	immediately.				
,,	13	,,	in the first	12	months.		
,,	11	,,	between	1	and	5	years.
,,	8	,,	,,	5	,,	10	,,
,,	4	,,	,,	10	,,	15	,,
,,	2	,,	,,	15	,,	20	,,
,,	1	,,	,,	20	,,	30	,,

That **there is no limit to the time that may elapse when surgical treatment may still be successful** is also shown by the cases of insanity mentioned in this work as treated by operation.

2	cases	were	cured	3	years	after	injury.
5	,,	,,	,,	4	,,	,,	,,
3	,,	,,	,,	8	,,	,,	,,
2	,,	,,	,,	11	,,	,,	,,
2	,,	,,	,,	16	,,	,,	,,
1	,,	,,	,,	25	,,	,,	,,
1	,,	,,	,,	31	,,	,,	,,

Other cases, too, not due to injury, but due to tumours, hæmorrhage, etc., **will be accessible to operative treatment,** if the localisation theories advanced in this work are confirmed by longer experience.

Lunacy is one of the most dreaded diseases which afflict mankind, and therefore any theory which gives hope of some success in the treatment of the insane is deserving of careful consideration and examination, even when not supported by such a mass of clinical material as is contained in this work. Of course, the majority of cases of mental derangement are not amenable to surgical treatment, but must be treated on medical and psycho-therapeutic lines.

The great fault of the lunacy system is that **our asylums are not hospitals,** and that their physicians are not allowed to fulfil the proper duties of their office. A man merged in a crowd of irresponsible beings, all under the influence of a common discipline, and under the control of common keepers, must lose his individuality, and cannot possibly receive that anxious care and attention at the hands of one

physician which is necessary from the nature of his case. What every mental patient needs, as the primary condition for recovery, is separate and individual treatment and consideration. What every asylum requires in order to become a truly curative institution is a hospital for the treatment of recent and acute cases, separate and distinct from the main establishment, to which each patient should be assigned on admission. Its medical staff should be ample, and their duties should be entirely restricted to the observation and treatment of their patients. The ideal would be, of course, to see the asylums thrown open like hospitals for visiting physicians and surgeons, and I would admit even students of psychology. Then would each case be studied individually, and if post-mortem examination took place in every case that died at the institution, psychiatry, in my opinion, would make rapid progress. Reception hospitals and greater facilities for private treatment of mental disorders are also needed for the very early and still uncertifiable cases.

The best thing to do with disease is to prevent it; the next best thing is to cure it when it first appears; the last, and least important of all, is to attempt to cure its later stages, and it is with this last and least important duty that the asylums of the world are mainly occupied. Mental disorders should be treated before they amount to insanity.

I propose to add a few words about the **characteristics of the feeble-minded.**

MENTAL DEFICIENCY

The brain develops up to a certain grade, and then, for some reason, the process ceases before the normal standard is attained. When the development is permanently arrested in early infancy or *in fœto*, the result is *idiocy*. When development proceeds to the stage of later childhood and then comes to an end, the result is *imbecility*; and arrest at a still later stage results in *feebleness of mind*.

Th most extreme form of mental deficiency is that of **Idiocy**. It is a congenital condition in which the intellectual faculties have never developed, or at least not sufficiently. Some idiots have abnormally large heads—hydrocephalic—while others have abnormally small ones—microcephalic. The former is a condition in which the brain is distended by an excessive accumulation of the cerebro-spinal fluid, and the skull in consequence becomes huge and of a globular form. In the latter case the brain is too small, and the excision of pieces of bone from the skull to give the brain more room was tried, at one time, as a remedial measure. But the operation yielded no permanent results, for, if the brain wanted to grow, the skull would grow with it. Another class of idiots are the *cretins*, a condition due to absence or atrophy of the thyroid gland, and sometimes to its hypertrophy. By feeding these patients with the thyroid gland of sheep remarkable cures have been achieved. Another type is the *epileptic* type, in which constant fits have retarded the growth of the mental processes. Others are the Mongolian, the paralytic, porencephalic, and lastly the traumatic variety, due to head injury.

The lowest type of idiot is one devoid of all understanding, in whom is found an entire absence of intelligence. Being incapable of any reasoning power, he has no appreciation of the commonest physical dangers. His faculty of attention is also wanting, except a momentary attraction by loud noises, bright lights, and similar exciting objects. Of most of them it may be said that they do not appear to be conscious of their own existence, much less of ordinary feelings of pleasure, pain, fear, and love, except in the most rudimentary way. The sight of food alone has the power to draw them from their indifference, and they may show attachment to whichever person takes care of them. There is no will power and no trace of the faculty of initiation. They have no power of expressing themselves by means of articulate language, but some of them succeed in making known their desires by certain signs, cries, or sounds, understood only by those in immediate attendance upon them. Their temper is easily excited. It is only in idiots of higher degree

that we are able to determine voluntary attention, and by that to develop their general intelligence. As a rule they do not learn to read, but some of the more educable ones may learn the alphabet and make out some detached syllables; but they rarely get to the point of understanding the printed words. Their writing, if at all possible, is still worse than their reading, for they lack the co-ordination of movement. Calculation is impossible for the lower grade idiot, and even the higher grade learns only the elementary figures, and those with difficulty. Not having any understanding, or but little, idiots rarely laugh; except when they laugh continually, as is the case with certain incurable idiots who giggle constantly while making their balancing movements. They are extremely timid; everything frightens them, because they cannot explain anything. Love of property exists sometimes to a considerable degree in higher class idiots. They do not hesitate to appropriate anything they want, especially if it be food. They are not naturally lazy; they are only inactive from want of attention and slowness of conception and movement. The musical sense is often preserved in them, quite disproportionately to the other mental faculties; and not infrequently those who cannot speak at all can hum tunes correctly.

The **Imbecile** is one whose mental defect exists from infancy, and is so great as to render him incapable of earning his own living, although he has intelligence enough to guard himself against the common physical dangers. Imbecility is a mental deficiency, either inherited or recognisable in the first few years of life, or occasioned by cerebral injury at or immediately after birth, or consequent on brain disease acquired in infancy or early childhood. In imbeciles we find defective mental powers of various degrees, from pronounced enfeeblement to grades of intellectual development, capable of fair education, but retaining a defect in some mental faculties. As a rule, imbeciles are fairly conversant with their immediate surroundings; they know their own names and are able to respond to them when addressed. In lower grade imbeciles the command of language is extremely limited; they are only able to pronounce a few words, or at any rate a few phrases, the correct significance of which they know. They can make themselves understood, but they fail to learn how to communicate their thoughts in spontaneous writing or to understand what they read. Voluntary attention exists within certain limits, but it is intermittent, and they pass from one subject to another without there being any relation between the two. Their memories are defective, and they do not retain from one day to another what they have learned with care and trouble. In some, the memory is apparently greatly developed; but close observation reveals the facts that they recite a piece always in the order in which they have learned it, and that the slightest interruption in the recital cuts it short, for they rarely understand what they are saying. It is difficult to educate them to read; and although some learn to write, they never form their letters well. They are unable to count beyond a certain number, and arithmetic is usually beyond their power. If they can add, they rarely can subtract, multiply, or divide. Yet imbeciles have been known in whom the memory for figures was not only well preserved, but developed to an extraordinary degree. Some have a special memory for dates and a perfect appreciation of past or passing time.

Imbeciles are very much influenced by rhythm, hence they like music, and some even the recital of poetry, though they may not understand a word of it. They have often a good memory for tunes. They readily acquire simple airs, and rarely forget them. This is the more striking because of the utter absence of any other evidence of artistic taste.

Some imbeciles reach a higher degree of mental development and are capable of conversing correctly, but their knowledge, as well as their vocabulary, is limited. Some of them exhibit a wonderful power of imitation and of repartee. Their credulity, as might be expected from their want of understanding, is very great.

Imbeciles are very egotistic, and occupy themselves above all with their physical well-being. Joy and pain are expressed vividly, and they often laugh without motive, even under sad circumstances. Imbeciles are fundamentally lazy, unless some special inducement to action is offered ; they have no endurance. They are often vain, quarrelsome, easily irritated, and frequently a source of annoyance to the household from their propensities to lying, thieving, and their general shamelessness and uncontrollable character. They are capable of manifesting a certain kind of affection to those who treat them kindly and with whom they live ; but the feeling is never profound. They are capable of a certain amount of training and discipline in the direction of their external behaviour, and to control their animal propensities.

We describe children as **Feeble-Minded** when they are superior to idiots and imbeciles, but still suffer from so incomplete a cerebral development that they are behind other children, of the same age and station in life, in mind and conduct, and do not profit by their environment and by education to the same extent as average children. The majority are defective from birth, or at least from infancy, having been normal until a fever, convulsions, or other disturbance damaged their brain and left a permanent defect. Attention in them is neither active nor lasting. The majority have no power of concentration, hence they are unable to learn things, or at least not so quickly as other children. Moreover, being inattentive and having little understanding, they cannot retain things they have observed or learned, and are slow in acquiring even elementary knowledge, such subjects as history or geography being quite beyond their powers. Their permanent stock of ideas is small, and they have little capacity for using it. Whilst the musical faculty is often preserved, the faculty of number is deficient. Even if they learn a little arithmetic, they rarely acquire sufficient knowledge to give change for a shilling. But still, as among the imbeciles, arithmetical prodigies have been known amongst them, without any other ability, evidently a certain part of the brain having remained uninjured and receiving more than its usual blood supply. Others have the memory for names, dates, or localities well preserved. With suitable training, the feeble-minded can acquire simple knowledge and can be trusted to carry out simple commissions and may be taught handicrafts, but they rarely know money values. In a certain sense it may be said of them that they do not grow old with their years. They remain childish, easily satisfied with trifles, and display interest in things which have long ceased to interest normal people of the same age.

That those who are mentally feeble should sometimes show moral deficiencies is only natural, considering that the lower the intellect, the feebler the control over the instincts and passions. They are easily influenced by others, have little self-control and power to resist temptation when it comes in their way. True, some are well-behaved, affectionate, and obedient ; but many others are mischievous and cunning enough to invent lies to escape the consequence of their misdeeds. Even the feeble-minded of a milder degree lack imagination in their outlook upon the affairs of everyday life and their own future. Their horizon is bounded by yesterday and to-morrow . They must be guarded from becoming a prey to temptations and being victimised by the unscrupulous. Among the well-to-do it is not the inability to earn a livelihood which attracts attention, but the lack of capacity to keep whatever they possess. Another defect not infrequent is their inability to say "no," so that they are easily "sponged" upon. These are the people who are ruined by becoming security for their friends, buy worthless shares, and whose wills are disputed on the ground of undue influence.

There is still another class, whose mental defect is not, like the one just mentioned primarily of the intellectual variety but is a *moral* one. The **Morally Deficient** child is a child who, by reason of arrested development of some parts of his brain, displays at an early age a morbid defect of the moral disposition

and higher altruistic qualities of the human race, associated frequently with vicious propensities on which punishment has no effect. There is sometimes, but not always, some slight limitation of intellect. Their most marked characteristic is a lack of power to recognise ethical distinctions, a lack of conscience, of the sense of right and of duty; and through this moral deprivation there is a serious lack of balance between the thinking and acting capacities. Without this power there is no check to the lower passions except by the intellectual consideration of utility and expediency, and unbridled egoism has full play. In the milder cases the individual may merely be exceptionally self-centred, incapable of appreciating the rights and feelings of others, and governing his conduct entirely by his own likes and dislikes, to which everything has to give way. And in the more marked cases, and in cases where there is also a transient intellectual defect, the latter prevents him from seeing beyond the moment's gratification to the unpleasant consequences which will follow. Sometimes they behave tolerably as children, but more often they lack natural affection, are especially rebellious to authority, are unkind to their brothers and sisters and to animals, irritable and hasty in temper, sulky when corrected, and sullen and morose. They tend to associate with those beneath them in the social scale, tell lies, and do not fully grasp the difference between right and wrong. As they get older they may be addicted to petty thefts, which are often concealed with an amount of cunning that would hardly be credited by those who have no experience of these cases. They do not appreciate the enormity of their offence, and when found out they exhibit no sense of shame. When they are punished and express regret, it is forgotten when the next temptation comes. They are unmanageable at schools and are a danger to other children. Next to their lack of industry, their most conspicuous quality is their incurable mendacity. The readiness, the resource, the promptitude, the elaborate circumstantiality of their lies are astonishing. Many of them are quite unfit, if left to themselves, to lead decent, inoffensive lives. Some of them are wicked enough either to plan or to permit suspicion or blame to fall upon others. Some cases are less extreme, and do fairly well until old enough to assume responsibilities. Some of them become inebriates. All act on impulse from lack of self-restraint. Some do well always for a period, and then they fall again. Whereas a criminal does often escape detection, the morally weak-minded hardly ever. Punishment is of no account to them, for they forget it precisely when they have the greatest need of remembering it. Education alone cannot eradicate what is bred in the organisation; but where there is some rudiment of affection, or conscience, or honest ambition, there is hope under appropriate treatment.

Of late, considerable attention has been given to the study of the microscopical appearance of the brain of feeble-minded; but, of course, that does not help us in the diagnosis or treatment of living imbeciles. The hopeless should be kept in special asylums, and those with some intelligence should be sent to training institutions, which, unfortunately, do not yet exist in sufficient number. By far the largest number of the mentally deficient that come to the notice of the mental specialist are of the milder sort; those to whom the term "mental deficiency" truly applies. Here, again, a proper ethological analysis will enable us to discover active or latent capacities and character-dispositions that may be utilised for the education of the child or youth; and a cranioscopical examination will assist us in determining the prognosis.

CHAPTER XXXV

THE ETHOLOGY OF THE CRIMINAL

As a result of scientific research during the XIXth century the conviction has gradually gained ground that **human beings are to a large extent the victims of their organisations,** partly inherited from their ancestry, over which they had no choice, and partly the result of their early education and environment, which also was not of their own selection. It is argued that no child calls himself into life, nor chooses the period, climate, or nation in which he shall be born ; that no child determines the manners, customs, laws, forms of government, religion, prejudices or superstitions with which he shall be surrounded from the moment of his birth ; that no child can determine to have good or delicate health, to be a male or female, to have a certain temperament, or definite inclinations or talents ; that no child can determine the prudence or folly of his instructors, the baneful or useful examples set before him, the influence which external circumstances shall have over him, his condition or that of his parents, or the source of stimulation which his passions and desires shall experience.

Thus it has come to be recognised that **our physical, mental, and moral strength or weakness is determined for us and not by us** through our inherited organisation and our surroundings in early youth, which are not of our choosing. This knowledge, which has spread throughout all civilised countries during the past century, has given rise to a humanitarian feeling towards all those who are found to be defective in body or mind and even towards those who are anti-social in their tendencies. Many delicate and afflicted individuals, who in former times would undoubtedly have perished, are enabled to reach maturity now, owing to the progress in the treatment of deformities and disease, and millions of money are spent in keeping alight the feeble flame of life in degenerate offspring, and the whole country is flooded with institutions to make things easier for the unfit.

Society enacts more or less uniformity of conduct. Anyone not conforming to its habit is liable to meet with the disapprobation of his fellow-men ; an act contrary to the interests of the herd is an offence, and since society for its protection has made laws, every offence which is punishable by law becomes a crime.

No matter what the laws may be, there will always be some people who will break them. Some men are more covetous than others by nature, and if they are not in the midst of plenty, and their ethical instincts have not been trained in their infancy and youth, they may take what is not theirs. Culture means the acquisition of self-control ; to manifest one's passions is considered bad taste in good society. In lower grade surroundings exhibitions of low passions are often applauded, language is coarser and more inciting, hence the frequency of transgression, deadly fights, sexual assaults, etc. There is too much of the presumption that all men have an equal chance in the battle against temptations, and too little acknowledgment of the part played by heredity and environment. True, we can overcome these by the exercise of our will, but such strong will, such tenaciousness to keep to one's resolution, is also due to our hereditary organisation and the stimulus of the environment.

The prevalent belief of people is that, in regard to the power of obeying laws,

there is among men no difference of mental constitution; that a good man *wills* to be virtuous, and a bad man *wills* to be vicious, and that either might *will* equally easily the opposite character. Hence the indignation and resentment felt against the criminal. Through the will being regarded as a separate faculty directing the moral destinies of the individual, the ignorant man, as well as the intelligent man, was held accountable for his actions, not only to God, but to the secular authorities, with little regard for the influence of education and environment in affecting his moral responsibility. Many of the cruelties of our penal methods are based upon this erroneous conception of the nature of the will and of human responsibility. Thus we often deal harshly with people who possess by their organisation strong impulses and are surrounded by temptation. It is easy to be virtuous when one happens to be so organised that one has no inclination, and when one has never been tempted, but a born eunuch deserves no credit for being a celibate.

Responsibility is the power on the part of the individual of responding to rational, social, and ethical stimuli or impulses, and of inhibiting stimuli of an opposite nature; and the corresponding expectation on the part of others that the individual will so respond. This implies on the part of society a duty of safeguarding those who, from immaturity or other causes, may be incapable of choosing their own environment against extrinsic stimuli of a dangerous or otherwise unfavourable kind. It implies, further, the positive obligation of providing such environmental influences as are calculated to develop the best possibilities of a given inheritance.

A good many people still hold the notion that all persons are equally good by nature, and might be equally good actually, had they but the will to be so. They fail to see that men are born with all degrees of moral capacities and incapacities, and some of them wholly lacking in that regard, just as they are born with all degrees of intellectual endowment, and some of them with none whatever. A man may be an idiot morally, as well as intellectually. Robberies and murders, as I have said before, have been committed in all ages and all countries, and neither education, legislation, nor religion, the prison, hard labour, nor the wheel have yet been able to extirpate these crimes. It is recorded that in Queen Elizabeth's time, out of every thousand persons born, five were actually hanged, yet it did not eliminate crime. Punishment cannot prevent the *wish* to commit a criminal offence, though it may prevent in some the actual committal of it. With many, it is temptation which excites the crime. Supposing we allow it to be education, and not nature, that produces vicious tendencies, the difficulty still remains the same, because education never would develop either good or evil inclinations, were not their germs previously existent in human nature.

Character-tendencies, that is, the tendencies to particular forms of virtue and vice, **are hereditary, but not the acts themselves.** Some authorities teach us that a tendency to drunkenness may be transmitted from parent to child, not by force of example and education merely, but by direct constitutional inheritance; but there are still very few men who will admit that a child may similarly inherit a tendency to bad temper and all its consequences, as well as many other evil inclinations, the same as a tendency to consumption or other disease. They recognise bodily defects, and also all the intellectual ones that limit the range of thought, but they continue to talk of the moral powers as if all men were born perfect.

The mental constitution of man consists—as we have seen—of animal propensities, social feelings, egoistic sentiments, intellectual capacities, ethical and religious sentiments. All these vary in degree of strength in each individual. We are endowed with weaker or stronger tendencies to them from our parents and ancestors, but early education and experience modify our original tendencies to a great extent, and every individual is partly taught, partly acquires for himself, the power of self-control.

Human beings may be divided in three classes with reference to the strength of their animal propensities:

First, those whose animal appetites or propensities are so powerful as to overbalance the restraining force of their moral and intellectual faculties. Beings of this constitution of mind are under the dominion of strong passions, and their impressions of moral duty are so weak as to offer no restraint to the gratification of their selfishness, while in most of them a limited intellect has obscure views of the real nature of things, confused perceptions of consequences, overweening confidence in their own power of concealment, evasion and escape. Any better endowment of intellect in this class is perverted to the purposes of crime; hence expert plan-laying thieves, swindlers, and forgers.

The *second* class of mankind is very numerous, consisting of those whose animal tendencies are nearly as strong as in the first class, but whose moral and intellectual powers of restraint are so much greater as to bring the tendencies to indulgence and forbearance almost to a balance. External circumstances in such persons turn the scale. In low life, uneducated, neglected, and destitute, they often become criminals; in a more favourable condition of education and society, they continue respectable; but, under the influence of a bad example, they will be found sensual, and often profligate, and they are always selfish and self-indulging.

The *third* class are the good ground. They are those who are "a law unto themselves." In them the animal propensities are sufficient for their legitimate ends, but the decided predominance of intellect and moral feeling renders it nearly a moral impossibility that the inferior tendencies should ever master them so far as to impel them to commit crime.

Crime is often nothing more than the unguided manifestation of the animal propensities. There are few persons who are not subject to evil thoughts, but they do not take form because they do not dwell on them. Moreover, there are few people who would not commit crimes if they could profit by them, especially when in need, were it not for the consequences if found out.

In speaking of criminals, we exclude, of course, that large class of petty offenders, whom accident and not taint has brought within the grasp of the law, many of them having been committed for mere breaches of bye-laws and committed to prison for having been unable to pay the fine imposed. Many such crimes are really misdemeanours, *i.e.*, the deeds are not wrong in themselves but made so by law.

Taking the above as our standard, the ordinary sane criminals may be divided into three classes: the accidental, the ordinary, and the professional criminal.

1.—THE ACCIDENTAL OR OCCASIONAL CRIMINALS,

i.e., those who, not being really criminally disposed, have fallen at some moment of temptation in consequence of the extraordinary pressure of exceptionally adverse circumstances. They have committed a single crime, which they are not likely to repeat, but the law punishes them by way of warning and as an example to others. Their crime is a chance crime, and the main effort ought to be to save the offender. These are the accidental or occasional criminals, deterred by the prospect of punishment and amenable to reform.

A subdivision of this class is the **criminal by passion.** Men have always regarded violent affections and passions as extenuating motives when their impetuosity, excluding premeditation and sometimes even consciousness, has led on to criminal action. But it often happens that, although the storm is raging in the mind, external circumstances may retard the outburst, when the mind and body may be more strongly agitated than if it were allowed to take its own free course. An atrocious resolve adopted during such a state should be regarded, under many circumstances, as the consequence of impaired health and perverted judgment.

And, indeed, if it be suicide, we condone the offence as committed "during temporary insanity," but if it be murder, the man is hanged. Those who commit murder in a fit of passion generally feel remorse immediately after, frequently so keen that they instantly commit or attempt to commit suicide. When convicted, they are always repentant prisoners, and amend their lives, or do not become degraded, so that in this way they encourage superficial observers to affirm as a general fact that ameliorative effect of imprisonment which is really a mere illusion in the case of the far more numerous classes of born and habitual criminals.

2.—THE ORDINARY CRIMINALS,

i.e., those who, having some degree of criminal disposition, might still be saved from crime had they had the advantage of a fair education and of propitious conditions of life, instead of the disadvantages of an evil education and of criminal surroundings. These are the men who drift into crime and whom every effort should be made to reform. Many of them have committed their first crime most commonly in youth, or even in childhood—almost invariably a crime against property, and far more through moral weakness, induced by circumstances and a corrupting environment, than through inborn and active tendencies. After this, either they are led on by the impunity of their first offences, or, more decisively, prison associations debilitate and corrupt them, morally and physically, the cell degrades them, alcoholism renders them stupid and subject to impulse, and they continually fall back into crime and become chronically prone to it. And society, which thus abandons them, before and after they leave their prison, to wretchedness, idleness, and temptation, gives them no assistance in their struggle to gain an honest livelihood, even when it does not thrust them back into crime by harassing police regulations, which prevent them from finding or keeping honest employment.

But there is no possibility of forming anything like a reliable estimate of their conduct outside from their behaviour in prison, the conditions being so widely different. Just as among the insane it is difficult to form an estimate of their complete recovery while in the asylum, because they are not yet subject to the forces of the environment outside and have not yet to take part in the struggle for existence, so it is with the criminals while in prison. To teach them to conform to the rules that exist in prison is not to educate them to live outside. It has also to be remembered that the poorer a man is the more difficult it is for him to avoid transgressing the laws of his country, even though he anxiously tries to do so ; and imprisonment frequently destroys the initiative for the exercise of the natural talent and earning capacity.

3.—THE PROFESSIONAL CRIMINALS,

i.e., the born criminals, whose instincts urge them blindly into criminal activity, whatever their circumstances of life, and whom neither kindness, instruction, or punishment will reform. This class furnishes the professional criminal, who deliberately seeks crime, whatever his opportunities for earning an honest living, and the one main thought must be to protect the community against them.

That there are born criminals we cannot have any doubt. I have seen in my professional capacity (see Chapter XXXIII.) so many sons and daughters of well-to-do, highly respectable parents, who, though perfectly intelligent and some even abnormally clever, manifested an incapacity to lead a moral life, and on whom all possible measures, punitive and therapeutical, had been tried without result ; and could not but feel the least doubt that these self-same young people, if not well-provided, well-clothed, and well-mannered, would make incorrigible criminals, as some, indeed, have become, notwithstanding these advantages. My case-books

contain newspaper cuttings of accounts of trials and convictions against them, repeated until I lost trace of them, owing to the frequent change of name. The medical psychologist is consulted as a rule when the boy or girl has reached adolescence, but the remedy must be started in infancy by special education.

A man is not necessarily a professional criminal because he lives habitually by illicit means. It may well happen that his first fall from honesty has left him no choice, and that he must either starve or steal. The true professional is the man who has gone into the business of depredation as a means of livelihood.

The professional criminal is the typical criminal born in crime, and whose vocation is crime, by a physical and psychical proclivity; a man in whom the selfish tendencies predominate over the moral and religious sentiments and altruistic motives, and whose intellectual powers, instead of inhibiting such tendencies, are employed to further them and to supply means for their gratification; moreover, such men are usually not influenced by domestic affections, and are much too insensible to the esteem of others to be prevented from committing crimes. The professional criminal plans crimes as the merchant plans business. He thinks dishonesty a paying game. He never has worked, and he does not want work. He prefers living by his wits. The regularity of life which work entails is more than he can bear. But his ranks are thinning because the odds against success are yearly growing heavier. Punishment is no deterrent to him, for he looks to the chances of escape.

Investigations have been made which show that in this type of man, not only the moral, but also the physical sensibility is much diminished, that he is less susceptible to pain than normal men. Callousness is more necessary to him than a loaded revolver. That he is not amenable to moral treatment is shown by the frequent recommittals and by the apparent absence of all remorse. He may feel and dread the material consequences of crime, but his conscience is not strong enough to torture him for his guilt. According to the evidence of night-watchers of prisons, he sleeps as soundly as the rural cottager, the simple peasant, or the most innocent in the quiet homes of social men. Repentance is rare. All the organisation of chaplains and teachers, with all the discipline of prison legislation, fail to turn him from the error of his ways. One cannot make an old fox into a house-dog, and one cannot make an honest working-man out of an old thief. The criminals who do sincerely repent are those who have been drawn into crime through imprudence, or an unfortunate fit of passion, poverty, and sore need, or from other very pressing external circumstances. When the fatal occurrence of circumstances has passed, the milder inner feelings become active. This is what usually occurs in the case of crimes committed in a fit of passion. After the event, total contradiction is manifested between the natural sentiments and the act committed, and this contradiction is what constitutes repentance, or the natural conscience.

Crime is so manifold and diversified, there is so much in it of a sporting nature, it opens such wide fields of originality that it is no wonder that the professional criminal, in whom the animal nature predominates over the ethical, seems attracted to it and prefers it to the more monotonous, tame, and toned-down humdrum life of good citizenship.

The professional criminal is frequently a man of superior strength, addicted from childhood to arrogance, bullying, and cruelty.

In the professional criminal the passions predominate not merely from an excess of animal propensities, but partly also from a defective condition of the inhibiting centres, the higher intellectual and moral qualities. Hence the frequent outbursts of fury and destruction in prisoners.

DAVID NICOLSON (late Medical Superintendent Broadmoor Criminal Lunatic Asylum) writes: "A current of irascible emotion with its destructive tendency

would in ordinary individuals be resisted, or at least moderated, by their sympathies and conscientious feeling; but such moderating influences occupy but a small space in the criminal nature, and consequently they afford a proportionately slight aid in resisting tides of passion."

P. NÄCKE ("Allg. Zeitschrift f. Psychiatrie," 1893) states that, amongst 53 women prisoners, 41 suffered from increased irascibility, 33 were simply abusive, 24 were destructive, 23 violent and dangerous, and 12 given to impulsive fury. All of them were egotistical; the altruistic sentiment seemed totally absent.

Given the criminal bent, instruction appears to do little or nothing to nullify it. In the born criminal's hands, it is only one weapon the more. Instruction is to the mind what athletics are to the body, neither less nor more; it may sharpen an existing faculty, but it cannot create a new one. Nobody supposes that athletics could make all men of the same height, weight, or vigour. Yet something of this sort is expected of education within its sphere. On the other hand, it is not immaterial whether a brain be empty of things or well furnished. An impulsive force traverses the desert brain of an ignorant person without obstacle. After the necessity of education, the utility of instruction becomes plainly apparent. It has been said that instruction can only render man more crafty, more skilful in evil, and consequently more dangerous. But everything which checks impulse must be regarded as moralising, and to furnish a brain with facts or ideas is inevitably to make it wiser. Consider also the highly important fact that, although the total amount of criminality does not seem to have been lessened by the spread of instruction, sanguinary crime is decreasing, while theft and crimes of cunning are on the increase. Violence has diminished and knavery grown. Hence, also, the less civilised men and countries tend toward having a higher percentage of violent crimes than those more civilised; and the cities being more cultured tend to furnish a lower percentage of crimes of violence than do the villages, but they furnish a higher proportion of fraudulent crimes.

The educated classes judge the uneducated classes with severity for their murders and violence, but there is plenty of vice and infraction of the law in the higher classes, but of a different type. Unscrupulous men, who have no conscience, are able to amass wealth by grinding down the poor, by cornering the necessities of life, by manipulating the stock market, or issuing well-prepared balance-sheets, and they count among the "Napoleons of Finance" and are respected citizens. The violence of crime among the lower classes may be due in part to excess in drinking, especially of bad liquor, in part to the lower state in evolution, and to the degenerative surroundings under which they live, circumstances which naturally reinforce any trend or tendency to the uncontrolled instincts with which their early life seems inseparably bound up. The dull, dreary, monotonous environment offered by the dismal streets in the poorer quarters of our English cities has a very depressing effect, and, considering the crowded rooms in which they live, we must not wonder that the public-house is an allurement, and that the voice of the tempter and agitator awakes an echo in dull ears. We must remember the difference in rank in criticising defects of moral character. The children of the rich have plentiful and healthful food, and under ordinary circumstances they have a well-regulated physical and mental education, as well as other advantages which those in lower life have not. The practice of their parents is not constantly enforced both by example and a sort of necessity, and the tendencies which they have inherited are not generally fostered by an entirely depraved moral medium. Far different is the lot of the children of the poor. Born in the midst of abject poverty, misery and privation are their lot from their earliest infancy; and their want of the common necessaries of life, with complete ignorance of its comforts, prompts them to the commission of crimes, and to the indulgence of their hereditary tastes, to relieve their immediate wants and sufferings. And thus their impulsive nature, so far from being checked by any moral considerations, is placed in a very hot-bed for its evil development.

We are all of us a compound of our inborn qualities and those that have been stamped, as it were, upon us by contact with the external world ; and we have no right to judge in an offhand manner of the innate qualities of a criminal without a very extensive knowledge of his upbringing and of the temptations and influences which have surrounded him. Theft by a person in necessity need by no means imply so vicious a temperament as that of a man who spends his life in getting the better of his less clever neighbours, and who enriches himself by the loss of others, as is done in many so-called legitimate ways ; and the killing of a man in passion may be done by one who would be incapable of settling an old grudge by taking a mean advantage of an enemy.

The man who amasses great wealth by grinding down the poor, by cornering the necessities of life, or by sucking the life-blood out of the toiler ; the unscrupulous financier who robs his credulous dupes—these because of their money are eligible for peerages ; the less refined criminal goes to goal. The former hide their guilt and salve their conscience by giving millions—though still only a fraction of their wealth—to charity. Society is indulgent to the fraudulent financier, who lives to rob, and hard on the larceny fellow, who robs to live. Criminal law, paradoxically enough, often catches the little fish and lets the larger ones escape through its elastic meshes.

H. J. BUCKLE (1821-1862), " History of Civilisation " (1859), and **A. QUETELET** (1796-1874), " Sur l'Homme " (Paris, 1883), found that in everything which concerns crime the same numbers recur with a constancy which cannot be mistaken. Every year there takes place nearly the same number of murders, and even suicides. The number may go up some years, and may be below the average in other years, because a number of factors are at work ; but, roughly speaking, statistics continue to tell the same tale, in spite of improved civilisation and remedial measures. It is only the method which differs. If we have very few highway robberies at the present day, it is because people travel no longer in coaches but in railways, because they carry fewer valuables on their person, and the police protection is better. Altogether, attacks on the person and burglary have diminished, but less easily detected crimes, as those of fraud, take their place. The wickedness and the all-devouring selfishness of man has not lessened ; it is only artificially dammed in by the dykes of the law and of civil society. The degree of immoral disposition has remained the same, but it has discarded the cloven feet and walks about in conventional costume and has become more elegant. Theft and illegal fraud are vulgar and clumsy selfish methods despised by the more clever rogues, who know how to keep their attacks on their neighbour's property within the letter of the law.

If the strictly criminal type of mind is held to be due to bad organisation, as I certainly believe it is, it is for society to say whether it will isolate those who possess it and protect itself. It prefers, as a rule, to do the first, and to protect itself by penalties of different grades following the detection of wrongs attempted upon itself. **The man of innate criminal type knows this ruling of the social law, and he accepts the challenge with the full power of his reasoning faculties.** Crime is, therefore, the result of bad judgment, when it is not the result of necessitous wants or due to passionate impulses. The criminal plays for wholly insufficient stakes, and appears incapable of estimating the chances against him at their proper value. Apart from moral considerations, could anyone assert with a full appreciation of the risks involved, such as a well-balanced and fairly well-informed mind would take account of, that it was " good business " to rob a till, to forge a cheque, to strangle a farmed-out baby, or to break into a suburban villa and murder its occupants for the sake of such small booty as was there to be had ? No, under present conditions it is not good business, and no normally constituted person would attempt it. There must be a warp in the mental mechanism before the first suggestion of the crime is entertained. There is, of course, genius for crime as for any other calling. The criminal section of society is very like other sections. It contains its master-

minds, its average practitioners, and its bunglers, the last-named of whom fortunately are in the great majority.

It is claimed that the fear of punishment, on the one hand, and the psychic shock of it, on the other, have a powerful reformative and repressive effect on criminals and would-be criminals. Fear is a deterrent, but not a reformatory emotion; and is not always deterrent, because **the criminal does not reckon with the possibility of being found out, but with the possibility of escape.** The typical criminal has no shame and, if repressed by fear alone, relapses into crime whenever there is any assurance of safety to himself. First there is the chance of not being detected, which is the most powerful spring of all contemplated crime; then the chance, in case of detection, that the evidence will not be strong enough, that the judges will be merciful or will be deceived, that judgment may be averted amidst the intricacies of the trial, that clemency may either reverse or mitigate the sentence. These are so many psychological causes which, conflicting with the natural fear of unpleasant consequences, weaken the deterrent force of legal punishment. Even when prisons were a great deal worse than they are nowadays, imprisonment did not keep those who had been in them from repeating their misconduct. **The severity of punishment does not prevent the wish to commit crime, though it does to some extent prevent the actual committal of it.** When people with a criminal tendency are brought daily face to face with the punishment awarded to criminal acts, and yet will persist in these acts, we must suspect something wrong in their mental organisation, something which they either cannot resist or can resist only with difficulty. That, as a rule, they can resist, is shown by their power to retard, precipitate, or cancel their acts altogether if the conditions are not favourable to success. They take their chance, and if they fail they blame themselves only for carelessness in neglecting some point essential to their success in accomplishment or concealment. Punishment serves a useful purpose as the expression of resentment of society which is to enter into the sum total of actuating motives.

Another factor in the inhibition of crime is the feeling of self-esteem and love of approbation of our fellow-men. The shame of exposure, trial, and punishment has reformed many a man. Fear and shame, in general, may stand in place of conscience. Therefore, in order to prevent crime, we should see that we bring up self-respecting citizens. The wider the contact of a man with his fellow-men, as in social intercourse, the more he cultivates these feelings. Even if he does not mind being condemned to gaol, his wife and children will be ashamed of meeting their friends and acquaintances, and for this reason will exercise a deterrent influence on the offender.

The proper housing of the poorer classes in England is a reform which is receiving recognition. Another needful step is the training of children to some trade or money-earning occupation, so as to prevent the creation of loafers, unskilled labour, *cul-de-sac* occupations. Thirdly, in this still very Puritanical country, the provision of plentiful wholesome amusement, as, for example, poor men's restaurants, where plentiful music is provided, and cafés with a liberal supply of newspapers, where the labourer can take his wife and child to meet other families, is needed in place of the common public-house.

In addition to the three classes mentioned we have

4.—THE WEAK-MINDED CRIMINALS,

individuals physically and mentally weak, miserable, submissive to circumstances, given to trivial crimes often repeated, as, for example, to theft of certain articles only, marked by temporary exemplary conduct followed by relapses, something

like the chronic inebriate. The weak-minded criminals are **habitual criminals,** men who live by dishonest means owing to defective mental constitution. Punishment has little effect on them, and they do not fear going to prison. They are mental defectives, not genuine criminals. They cannot " will " an honest life.

To this class belong the foolish odds and ends of humanity, the people of no foresight. No doubt there are among them some who are gifted with exceptional capacity, but, even with these there is a weak joint in the moral harness. A great character sets his face like a flint against the seductions which, if yielded to, would prove his undoing, but, where the character is weak, temptation is succumbed to with fatal facility, and in due course the weakling swells the ranks of the criminal classes.

That a large number of criminals have not the same vitality and intelligence as law-abiding citizens is shown conclusively by the following observations.

The mortality among juveniles in reformatory and industrial schools is higher than the mortality among the general population of a similar age. It has also been pointed out that the juvenile prison population, as a whole, are under the average weight of the general community at the same period of life. Further, it has been shown that a high percentage of these juveniles are descended from such a feeble stock, that over thirty per cent. of the industrial school, reformatory school, and prison population have lost one or both parents in early life. In other words, the physical basis of mental life is in a worse condition amongst juvenile offenders as a body than amongst the ordinary population at the same stage of existence. In addition, it has been shown that nearly one-third of the inmates of reformatories descended on one or both sides from parents who neglected to control them, or deserted them, or were in prison for crime. The majority are either unable to read and write, or can read and write only imperfectly, many because of defective mental capacity.

Reading the police reports one is struck by the number of apparently purposeless crimes that are committed. It is not to be wondered at when we realise how large is the proportion of the weak-minded. As the lame man wants his physical crutch, so these poor creatures need their mental crutch, and when that is withdrawn many of them inevitably fall. The more amenable they have been to good influence, the more readily may they succumb to bad ones. They lack will-power, and this must be super-imposed from without. If it be a power for good, all is well ; if for evil, as it generally is, the result is disastrous. Criminals, paupers, drunkards, prostitutes are frequently descended to these conditions because they are feeble-minded, and our charitable and State institutions, homes, industrial schools, reformatories and prisons fail to stem the evils with which they contend, because the public acts on the assumption that temporary care and training are all that are needed.

Sir **BRYAN DONKIN,** one of H.M. Commissioners of Prisons, at a conference at Birmingham, made the statement that " the weak-minded amount to between ten and fifteen per cent. of the total number of persons committed to prison ; the true maximum is probably even higher than this. Owing to their inherited incapacities and to certain surroundings, a large number of mental defectives tend to become criminals, and a considerable proportion, even twenty per cent., of so-called criminals or law-breakers are demonstrably mentally defective."

It is sad to remember how many charitable agencies are wasting their powers, because they do not understand that it is impossible to rescue the weak-minded unless it is done once for all. People who deal with these degenerates and see them under control, behaving in decent and orderly fashion and generally maintaining good habits, are apt to forget that the control, and that alone, is the cause of the good behaviour. that as soon as this control is removed these weak-minded men and

women are likely to succumb to any other influence which may be brought to bea

Cleverness in planning crimes does not exclude weak-mindedness. It is simpl the employment of what intellect there is available for the purpose of gratifying passion. Even idiots confined in institutions sometimes show cleverness in the mischie they do. Strong propensities, in man the same as in animals, gives inventivenes and craftiness in the employment of means to gratify a desire. This would explai the apparent contradiction in the intellectual manifestations of a criminal who fron one point of view appears almost a genius and from another a mental deficient.

So far the intellectually deficient have been dealt with ; but there are person intellectually quite normal, who are merely morally deficient. It is this class of

5.—MORALLY WEAK-MINDED CRIMINALS

which we shall now have to consider more fully.

If the mental defect is of the intellectual variety there is usually no difficulty in recognising it. But if the effect is a moral one, it is difficult for anyone but the expert to distinguish iniquity and folly, wickedness and crime. There are persons born with a marked deficiency of the moral sentiments, wholly insensible to the moral relations of life, as deficient in this regard as a person colour-blind is to certain colours, or as one who is without ear for music is to the initial harmonies of sound. Those who study reports of criminal trials must be struck with the constant recurrence, among those who have committed great crimes in cold blood, of a mental condition marked by the absence of all moral remonstrance before the act premeditated, and the absence, not less complete, of all remorse after the accomplishment thereof.

For the offspring of poor parents who suffer from moral weak-mindedness there is nothing but the prison ; but even the offspring of wealthy parents often have to go to gaol.

One of the first signs of such moral weak-mindedness in early youth is an incapacity to tell the truth. These children lie to themselves and to others continually, until they are no longer capable of distinguishing clearly between that which has been experienced and that which has been invented. This habit, unless treated early, becomes rooted and remains through life. In adult years such persons cheat and make up things, either half consciously or quite unconsciously. They are instinctive liars, and are incapable of speaking the truth, even if they are put on their oath. Such a pathological liar confuses the products of his fancy with realities. False memories constantly disturb his reproductive faculty. Since he plunges with his whole attention into the deceptive creations of his fancy, in such a way that they become realities to him, he has an assured appearance, and he presents his humbugs and swindles so ingeniously and naturally, with such an innocent expression or with such unfeigned enthusiasm, that he succeeds again and again in convincing his fellow-men, where a conscious liar, who coolly and clearly measures his words in constant fear of contradicting himself or being trapped, meets with instinctive mistrust. In the consciousness of the common or normal liar two trains of thought flow beside each other—the thought of the truth and the thought of the lie—and they trip each other up. In the brain of the pathological liar all is unified, and so he can carry through the most magnificent swindles artistically and with inner conviction. Thus he drags a multitude of credulous souls with him to ruin. The public believe blindly in his alluring portrayals, his poetic effusions, his fairy tales, until at last some chance, or the reflection of a thoughtful man, brings the end with panic, and usually a sensation in the courts. Then, as though wakening from a dream, the pathological liar collapses, for the moment almost as astonished and dismayed as his victim—only to begin soon again, for he cannot help himself.

In the moral imbecile, the stock of showy and superficial knowledge, the confident and boastful manner, the glibness of tongue, the spurious brightness, the cunning and carefully-planned schemes—all these mask the significance of the supreme selfishness, the lack of shame and remorse, the unbounded egotism, the cruelty, the lack of fear of consequences, the love of notoriety, the failure to respect the feelings of others, the idleness and tendency to early vice which are apt to characterise this type of defective.

6.—THE INSANE CRIMINAL

This class forms quite a small number, not so numerous as the pleadings of insanity in courts of law would make it appear.

Weak-mindedness is common among habitual frequenters of prisons, not so insanity. Weak-mindedness means arrest of brain-growth or congenital defect; insanity is an acquired disease, though the tendency to it may be inherited. The weak-minded show symptoms of their defect from childhood; not so the insane. The weak-minded commit the lesser crimes, the insane the greater. One half of the population of Broadmoor Criminal Lunatic Asylum are there for murder, attempted or actually committed. The rest are chiefly for violence or sexual offences, where the manner and the grossness of the outrage would draw attention to the prisoner's mental state.

The ordinary criminal *will not*, and the insane criminal *cannot*, exercise self-control; that is the difference. The one is to be blamed, the other to be pitied.

It is commonly taken for granted by lawyers that if a rational motive can be found for the criminal offence, such as lust, rage, greed, or any other passion, there is no ground to allege insanity, or, at any rate, no ground to allege exemption from responsibility, by reason of insanity. In the eyes of the law, the ideal madman acts without motives or acts from insane motives. But insane persons have the same feelings and passions as those who are not insane, but they do not exercise restraint to the same extent as normal persons.

To establish a defence on the ground of insanity it must be proved, according to English law, that at the time of committing the act the accused was labouring under such a defect of reason as not to know the nature and quality of the act he was doing, or, if he did know it, that he did not know that he was doing what was wrong. The criminal is supposed to be conscious of the nature and quality of his acts; to know that they are injurious or noxious, and worthy of punishment; and to be able to control them. An insane person may cause the same injury to society as a criminal, but, seeing that he is not able to control his acts, or is impelled by some false idea for which he is not responsible, or is ignorant of the nature and quality of his act, and its consequences to himself and others, he is not punished. In the one case the person is supposed to be able to recognise right and wrong, and to act accordingly; in the other case he is not able to distinguish and to decide.

We are not all alike in our organisation or our education; the problem of life is easier for one than for another; some of us have more temptations than others; but this does not compel us to yield to them. So long as a man is himself—so long as he is not a madman—he has at every point the power to say "yes" or "no." He can, in other words, exercise self-control and self-denial if he will. It is an unstable condition of the brain centres which allows action to take place upon impulse, which a healthy state of the brain would have enabled us to resist. The desire to do the right thing and avoid the wrong may be as keen in the one state as in the other, but the power to *resist* is absent in the one and present in the other. **Very few people would resist temptation if the temptation were sufficiently strong.** In that want of power lies the true evidence and fact of the disordered brain, and not, as legal psychology assumes, in the knowledge which may be present. True,

some lunatics acting upon impulse show no regret, no sense of the nature of their conduct, but there are others who may weep with bitter regret over that which they have done, and who can give no explanation of the motive. **The knowledge of the difference between right and wrong is therefore no test of insanity.**

There are comparatively few madmen of whom it can be truthfully said that they have no proper knowledge of right and wrong. They often do wrong by reason of their mental disease, but most of them know at the time that the act is wrong and against the law of the land. They may have the power of *distinguishing* right from wrong, but they have not the power of *choosing* right from wrong. They are often conscious of doing wrong, but have not the power to stop the brain machinery ; they lack the self-control. They are often the slaves of a conception which they not only cannot check, but they may even devise means of carrying the conception into action.

Taking even sane persons, it must be apparent to the most ordinary observer that the majority of authors of violent and reckless crimes, especially homicide, manslaughter, and serious assaults, are under such influence of passion as to obscure reason and reflection for the time being, and that they are not thinking at all at that moment of the consequences of their acts, or that they are doing wrong. Whether a jealous husband shoots his wife's lover to vindicate his own honour, as sometimes happens in France ; or a burglar stabs a policeman in order to prevent himself being arrested, as sometimes happens in England ; each may be, at the time of the act, incapable of distinguishing right from wrong. In the first case, the thirst for revenge, in the second, the desire for liberty, completely obscures the moral sense.

There is perhaps no class of persons so much to be pitied as those who act on impulse, especially when what they do has the aspect of premeditation. Such impulsive actions are particularly common amongst the uneducated. **Irresistible impulse** is, unfortunately, no mere fancy, invented for the special benefit of accused persons. It has a real existence. All children act on impulse ; education is supposed to give us deliberation and hesitancy. There are few persons in ordinary life, even amongst the most sane, who are quite free from occasional impulses to commit acts which are inconsistent with strictly moral rectitude. The particular nature of the desire differs with the individual and with the same person under different circumstances. Some feel an impulse to throw themselves down from a height or over the side of a vessel into the water. One person has a desire to scream in a crowded church or theatre, another to smash something valuable on the table. All these impulses are, by the healthy mind, resisted and controlled, but when the mind is not healthy, when by disease the controlling power of the higher centres is inhibited, then an insane impulse may be let loose in any direction—homicide, suicide, mere wanton smashing, or causeless violence.

By an impulsive act is to be understood an act which is unpremeditated, which is undertaken on the spur of the moment, and without any, or with the minimum of, balancing of advantages and disadvantages to be obtained from the act. Impulsive acts are commonly the acts of those who have little power of self-restraint, and for this reason, as well as for their usually unprofitable character, they are regarded with reprobation. An insane person will suddenly start up from a state of quiescence, and even of lethargy, and commit a violent or unprovoked assault or act of destructiveness without warning, and apparently without premeditation.

The reader is reminded here of the large number of recorded cases of criminals which have been treated surgically (see Chapters XXXI. and XXXII.).

7.—THE SEMI-INSANE OR BORDERLAND CRIMINALS

Between those persons who are certainly insane and those who are undoubtedly sane, there are a great many on or near the borderland, and it is in these cases that

difficulty arises when a definite judgment has to be pronounced one way or the other. The requirements of the law demand that a definite boundary shall be drawn, where science tells us that no natural frontier-line exists. Perfect mental health is probably as rare as perfect bodily health ; and it is most difficult to decide what amount of departure therefrom should be held to constitute insanity, or to confer irresponsibility. It may fairly be argued that the commission of a brutal crime is in itself proof of the existence of an unhealthy state of mind ; but it is certainly no proof of such a degree of insanity as would justify its perpetrator being held irresponsible for his act. Crime is punished by law, not from any desire for vengeance upon the criminal, but in order that he and others may be deterred from its commission in the future.

The legal view of insanity is that it is a disorder of the intellect. It ignores the emotions and propensities. But no one can be said to be of sound mind unless all the mental functions—intellectual, emotional, and instinctive—are healthily performed. The legal test of insanity is simply a test of knowledge, whereas anyone acquainted with diseases of the brain must be aware that the disorder expresses itself not only in perverted ideas, but in all sorts of perverted feelings, appetites, and instincts. The law does not embody that, but fortunately in practice it is often allowed. It is by no means unusual to find the disorders of the emotions and propensities out of all proportion greater than the disorder of the intellect, and this is especially the case in regard to those victims of insanity who are most likely to bring themselves within reach of the criminal law. It is a common experience in lunatic asylums to find that the very persons who are most dangerous to themselves and those about them are the most intelligent inmates in the institution.

It is very difficult to perceive the motives of human action and to prove they are morbid if behind the emotional stimulus there is no delusion or intellectual deficiency. Not only is there such a state as constitutional immorality in an otherwise sound person, but in the early stages of insanity the psychosis may be slight, having only just begun, and a certain lucidity preserved, yet the patient may display a shocking degree of immorality in his feelings and conduct. In such instances the faults of character are out of proportion to the intellectual defects. The public are very ready to cast the stigma of insanity upon anyone who talks foolishly, but hesitate to confer it upon the person who commits foolish acts.

Amongst persons of undoubtedly unsound mind we have the *hypomaniac*, who may reason so ably that he gives the impression of being saner than in his normal state. The *melancholiac* also reasons clearly, and his depressed condition may be mistaken for the outcome of remorse for the crime. The *paranoiac* will defend his misdeed by able arguments ; his state of mind will have to be examined very closely to discover that he reasons from false premises.

The question of sanity has to be decided chiefly in cases of sexual crime, larceny, manslaughter and murder.

With reference to **sexual crime,** the chief offender is the man suffering from *General Paralysis of the Insane*. His sexual excitement, which at the commencement of his disease is often in excess, may result in rape, exposure of the person, and other acts of indecency. Such patients have lost the sense of propriety and are apparently unconscious of doing wrong ; at least, they seem to take no precaution to prevent detection. In *Senile Dementia*, too, there is often erotic excitement, leading to assaults on children, pæderasty, and other perverted manifestations. On the other hand, false accusations are often brought by young women suffering from *hysteria* and elderly spinsters in the *climacterium*, such as that liberties have been taken with them.

Kleptomania occurs in the mental disorder which sometimes accompanies pregnancy. Weak-minded persons are prone to commit petty acts of larceny. The *hypomaniac* sometimes steals whatever he can lay his hands on, but the articles

stolen are often thrown away as soon as they are in his possession, and he steals almost openly. *General Paralytics* in the early stage of the disease not infrequently steal without reflection, though sometimes with ingenuity, as a rule any article that takes their fancy. They also commit frauds of every kind, generally neglecting ordinary precautions. In the latter stages of General Paralysis they again steal, but this time under the delusion that everything belongs to them. They then appropriate all sorts of articles, hoard and conceal them, and immediately afterwards lose all recollection of them. Then theft may occur in persons who from childhood have been "morally weak-minded" and easily yielding to temptation. Their insanity can be proved only by investigating their entire history, from infancy onwards, and by showing the co-existence of other defects of morality. Another important class of Kleptomaniacs are those who are perfectly sane in every other respect, but have morbid impulses whenever there is any temptation to pilfer. Such impulsive stealing has certain points which are of importance to know. The person may be rich and by no means ungenerous with his money, and may yet appropriate articles which are worthless in themselves and of no practical use to himself, the articles stolen being generally of the same kind—handkerchiefs, ties, watch-chains, scarf-pins, books; moreover, the stolen goods are not parted with for personal gain, but are accumulated uselessly. These are the points of difference between kleptomania and theft.

As regards **manslaughter** and **murder**, assaults on a person, with or without intent to kill, are made in *acute mania*. There need be no delusion whatever; the crime is simply the outcome of ungovernable passion. A person suffering from *melancholia* may kill his wife and children, hearing the voice of God within him commanding him to do so. Persecutory hallucinations and delusions may cause the *acute alcoholic* to turn upon his enemies and attempt to kill them. Wife-beating, inhuman treatment of children, attacks upon associates as the effect of blind passion, are common to *chronic alcoholism*. Assaults may also occur as the result of delusions, as in *paranoia*, and may be unpremeditated or designed. The paranoiac kills a stranger, mistaking him for his long-sought enemy. The murder is done openly and he justifies it. These patients often object to the defence of insanity in their behalf. They do not like to be called insane, even if they risk their lives when on trial for murder. As the law stands, an insane delusion is a defence to a criminal charge only when the imaginary facts would, if really existent, be a legal justification. If A kills B under the delusion that B has slandered him, he is guilty of murder, but if A kills B under the delusion that B is trying to kill him, he is not guilty of murder.

Political paranoiacs are common. They are men with tainted brains who speculate on political affairs and get fixed ideas that the State is mismanaged, that the people are wronged, or else they have imaginary grievances, or real but exaggerated, against certain officials. Paranoiacs dwell on these ideas so persistently, although in every other respect reasonable beings, that the brain, so to say, becomes soaked in them and the conduct becomes affected. If a murder of some exalted personage is the result, popular indignation rises so high that even when the insanity is pronounced, feeble or no attempts are made to prove it. Many anarchists are men suffering from a form of paranoia, and, misguided by political obsessions, they think themselves persecuted and called on to act as martyrs and to kill some great person in the name of Liberty.

Auditory hallucinations are often the precursor of insanity, and the voices heard may incite to murder. False accusations may be brought by insane persons owing to insulting voices they hear; such a condition may lead to a carefully planned action against particular individuals, or may result in a sudden violent attack on a chance passer-by who happened to look at the person or made some innocent remark. Voices may also be heard in apparently sane persons suffering from internal ear trouble, and this latter complaint, even without auditory hallucinations, may lead to irresponsible actions by direct or reflex irritation of the brain (see Chapter XXXII.).

Injuries to the head sometimes cause a deterioration in brain energy and consequent weakening of the character with criminal dispositions. In others, injuries of the head give rise to morbid impulses of a criminal nature which the person is conscious of, but cannot control (see Chapter XXXI.).

Epileptics are particularly liable to criminal acts. All is well if the epileptic have genuine convulsions, which any layman can recognise. Sometimes, however, there are no convulsions, but the fit is replaced by a paroxysm of mania, in which the epileptic may perform actions as automatically as his convulsive movements are performed at other times. In other words, the nerve storm may discharge itself in a physical manner, or by psychical action alone, or sometimes in both ways, one following closely upon the other.

I have seen a number of cases of young men guilty of theft and other offences *at absolutely regular intervals*, their conduct in the periods between being exemplary. The regularity of their offences at definite times suggested psychic epilepsy, and that the diagnosis was right was proved by the fact that they did well under treatment and became honourable citizens. But it is only the well-to-do classes that can afford the services of an expert and who will be believed by a magistrate ; the poor have to go to gaol, and since their crime is recurrent, they are regarded as habitual criminals and punished with ever-increasing sentences.

Epileptics, after a fit, frequently have a brief attack of furious mania before they recover consciousness. They are violent and destructive, being evidently excited by frightful hallucinations. After the attack has subsided, the individual returns to his normal condition, giving no indication of what he has gone through. In the less serious forms there may be no excitement, but the patient may act like a somnambulist, and do various things, normal, foolish or criminal, of which he has no recollection on awakening. The person on whom the attack is made has, as a rule, no difficulty in restraining the patient, but a misfortune is almost sure to occur when the person attacked is asleep or is too feeble, as in the case of a child, to resist. Sometimes the dreamy state alone will take the place of a fit, and if the patient is suffering from minor epilepsy, which resembles simple fainting fits, *i.e.*, without convulsions, it may be very difficult to convince a jury that a crime committed during this state is due to a disease and should exempt the patient from responsibility.

In the course of thirty years there were at Broadmoor Criminal Lunatic Asylum, amongst the total number of patients admitted, twelve per cent. who were described as epileptic. A tabulation of the crimes and offences of these epileptic patients showed that 66 were guilty of homicide, 41 of attempts at homicide, 28 of larceny, 7 of arson, 6 of burglary, 3 of manslaughter, and the rest of other offences. That epilepsy is not more frequent among criminal lunatics than might be expected may be explained by the fact that persons suffering from epilepsy are, when at large, kept under observation and thereby prevented from committing harmful acts.

We must distinguish psychologically (and in the matter of treatment) between an individual who, while insane, commits a crime ; and a criminal—and more especially a habitual criminal—who becomes insane while undergoing imprisonment ; in short, between a criminal lunatic proper, and an insane criminal. Technically, and in practice, the term " criminal lunatic " is not applied except to a person who has committed a crime, and who is for that reason under special detention as a lunatic ; and it matters not whether the priority of occurrence was with the insanity or with the criminal act, that is, whether the individual in question was insane when he committed the crime (King's Pleasure Lunatic), or was a criminal when he became insane (Secretary of State's Lunatic).

A considerable number of murders are committed with such an excess of brutal and revolting violence as seems to establish a *prima facie* case of insanity in the murderer, and some of these are committed by persons known to be epileptic. In such cases the victim is not only killed, but mutilated or battered almost out of semblance of humanity.

Here is one of the numerous examples one may read in the daily papers. It is copied from the newspapers of July 19th, 1908:

ROADSIDE MURDER

DEATH SENTENCE FOR TERRIBLE CRIME

JURY DISAGREE WITH DOCTORS' EVIDENCE

Yesterday the Yorkshire roadside murder was the subject of investigation at Leeds Assizes, where James Jefferson, twenty-one, labourer, of North Shields, was condemned to death for the murder of Mrs. Elizabeth Todd, thirty-one, on the roadside at Otley Chevin, in May last. Mr. Bruce Williamson, for the Crown, said there arose the question as to prisoner's mental condition, and as to whether he was fit to plead. He proposed to submit evidence as to his mental condition. Medical evidence was then called. First, Dr. Edgerley, of Menston Asylum, gave evidence, and then Dr. Exley, of Armley Gaol. They both considered him unfit to plead, but the witnesses having been questioned by the judge at considerable length, the jury found that prisoner was fit to plead, and the trial proceeded. The murdered woman, wife of a shoemaker living near Otley, had been on a visit to her mother's house some little distance from her own home, and on her way back she was overtaken, or was met, by the prisoner. It is alleged that without any reason he assailed her with a knife. Ferocious and unexpected as was the onslaught, she made a valiant but unsuccessful fight for life. Repeated stabs killed her, and it was stated that accused was still wrestling with her dead body, endeavouring to cut off the head, when Mr. Helliwell, a provision dealer, driving along the road, was the horrified spectator of the terrible crime. Whipping up his horse, Mr. Helliwell dashed off at full speed for assistance. A quarter of a mile up the road he found some men, and drove back to the scene of the affair. By that time the man had disappeared and so had the body, but after looking round, the searchers espied over a wall the prisoner, who was hacking at the body, then headless and stripped of its clothing. Mr. Helliwell called out, but the prisoner made no reply, and continued to cut away at the victim's arm. Prisoner was seized, and he said: "I do not know what made me do it." At that time the woman's head was lying some distance away in the field. The crime created a great sensation by reason of the fiendish brutality and amazing callousness shown by the prisoner. Yesterday the chief interest in the case centred in the defence. Drs. Edgerley and Exley, recalled as witnesses for the defence, gave evidence. The former expressed the opinion that prisoner was mad, while the latter said he believed prisoner knew he was killing the woman, but witness did not think he appreciated what he was doing. The evidence of Dr. Ellison, deputy medical officer of Armley Gaol, fully confirmed that of Dr. Exley. Mr. Lawrie, for the defence, ridiculed the idea of robbery, and, apart from that, urged that no sane man could have been guilty of the crime alleged against prisoner, who could not have had the smallest knowledge of the offence he had committed. The judge, in summing up, said there was no doubt prisoner had committed a murder of a ferocious and fearful character, and the only question was whether, when he committed the deed, he knew what he was doing. Prisoner, a feature of whose trial was that he had at first pleaded guilty, and then, at the instance of the judge, pleaded not guilty, was found by the jury to be guilty, and was sentenced to death. Prisoner, after jury's verdict, persisted that he was not in his right mind at the time the crime was committed.

I may add that the Court of Appeal quashed the sentence.

In Chapters XXX.-XXXII. a number of cases have been quoted showing that **injury to the side of the head (temporal lobes) frequently leads to epilepsy, violence, and homicide,** and that surgical operation is indicated in these cases. That this knowledge has as yet penetrated very little into scientific and legal minds is shown by the following case taken from the daily papers at the time of writing this chapter.

Henry Perry murdered a family at Forest Gate with *comprehensive and aimless*

brutality, which would lead one to suspect mental disorder. Sir Robert Armstrong Jones, Dr. W. H. Y. Stoddart, and Dr. H. J. Norman gave evidence at the trial in defence of insanity; and Dr. W. D. Higson, medical officer at Brixton Gaol, was called by the Treasury in support of the case for the prosecution. The evidence showed that prisoner came from an insane stock, that his sister was an epileptic, that he himself suffered from fits at times, and had aural hallucinations. The jury found the prisoner guilty and he was sentenced to death.

The "Times" of June 24th, 1919, reports the proceedings at the Court of Criminal Appeal. The ground of appeal was that Perry was insane. The counsel for the prisoner said that the defence had been hampered at the trial as they had no information about the prisoner's antecedents, except that obtained from the prisoner himself. Perry's half-sister said that he had a fit at her house seven years ago. He had always suffered from headaches, and he used not to be able to lie with his head on the pillow in the usual way. A medical witness, Major Stewart, said that he thought from an interview with the appellant, when he sought assistance shortly before the murders, that he was quite wrong in his head. Dr. Hyslop, the mental specialist, expressed the opinion that the appellant was insane, that he was suffering from a form of insanity and homicidal mania at the time of the murders, and that he did not know the difference between right and wrong. If he had been consulted on the matter before it came into the hands of the police it would have been **a case in which he would have recommended an operation on the injured area of the man's skull.** The appellant was insane now; he had organised delusions, and had had hallucinations and visions. His state of epilepsy would lead to his alternately forgetting and remembering what he had done. Perry said to him that he did not know anything about the murders and did not believe he had done them. Another witness showed that the prisoner's previous prison records mention his having epileptic fits and delusions; but the Chief Medical Inspector of Prisons gave evidence that no one had ever actually seen the appellant in a fit. Dr. Higson, medical officer of Brixton Prison, said that Perry gave him minute details of his crime, and he never professed that he remembered nothing about the murder. He gave the reason for the murder, and he satisfied himself that it was not due to hallucinations. The Lord Chief Justice pointed out that the crux of the case was whether there was evidence that at the time the murders were committed the man was suffering from an epileptic attack, otherwise it would be dangerous if a man were able to say: "*I once had an epileptic fit, and everything that happens hereafter must be put down to that.*" The appeal was dismissed and *Perry was executed.* It was stated at the inquest that he had been for a great part of his life in prison. He had been convicted nineteen times; three of the sentences were of penal servitude.

This case shows clearly the necessity for an institution for the observation and treatment of persons accused of crimes and suspected of being insane. An operation for the removal of the affected brain area might have altered this man's career and added to our knowledge of brain functions.

As a rule it should not be difficult to decide between a case of murder and one of insane homicide.

The manner in which the murderer sets himself to the commission of his crime as well as his subsequent conduct is very different from the proceedings of the madman. The former often has accomplices, he commences with premeditation, lays a plan beforehand, chooses time, place and circumstances adapted to the perpetration of the deed, and generally has contrived some method of escape after the catastrophe. He always studies concealment and personal safety, and when there is danger of detection uses all possible despatch to escape the punishment due to his crime. Moreover, the murderer seldom sheds more blood than is necessary for the attainment of his object.

All these particulars are reversed in the madman. He has either no motive or he acts under a motive which, to a sane mind, would be quite inadequate. He has no accomplices, he rarely communicates his purpose to others, he rushes on his victim as if driven by a sudden impulse, seizes whatever weapon chance throws in his

way, and sometimes seems to be excited powerfully to the attempt by the sight of implements fitted to his purpose. He lays no plan for escape, and seldom attempts it after perpetrating the act. Often he has been known to sit down quietly when he could easily escape and wait till he is seized by the officers of justice. In many instances the insane homicide has avowed his act with perfect indifference, and without exhibiting any sign of regret or remorse, or apprehension of censure, or dread of punishment; sometimes he has surrendered himself to officers of justice and expressed a wish to suffer the penalty of the law. He often kills a number of victims at a time, and frequently they are persons to whom he had been attached, often his relatives, his wife and children; sometimes they are persons whom he has never seen, entire strangers against whom it is inconceivable that he could have any motive of malevolence.

One remark in conclusion: **not all criminals are insane.** There are many, no doubt, who are either weak-minded or of unsound mind, but they form a small percentage of the entire number of criminals, and we must remember that society is bound to protect itself, whether the criminal be of sound or unsound mind. It has also not to be forgotten that punishment sometimes stops even a lunatic from a criminal action. The conduct of most lunatics is in part sane and in part insane. While they may not properly be punished for the insane part of their conduct, they may properly be punished—though with mitigated severity—for wrong-doing, which belongs to the sane part of their conduct. Hence some authorities hold that, so long as the mind of the lunatic is clear enough to be capable of forming a true and intimate connection between the wrong-doing and the punishment which follows it, so long are we justified in inflicting upon him some punishment. But if the insane person must be punished, he should be punished as an insane and not as an ordinary criminal.

Enough has been said to show that **crime is not always the outcome of wickedness, but often due to disorder or disease of the brain,** and that therefore the medical and psychological expert should be called upon in all doubtful cases for a diagnosis.

When we reflect how irritation, injury, or disease of the frontal brain can cause loss of control over the passions, and thus create an impulsive nature; when we reflect how a slight ear affection, irritation, injury or disease of the temporal lobes can cause offences against property and crimes of violence and homicidal mania; when we reflect how irritation, injury, or disease of another part of the brain can cause all sorts of sexual excitement and give rise to offences against public decency, to bestial assaults, and various perversities; when we read the large number of medico-legal cases in this work, in which men have committed crimes owing to defective working of the brain, and reflect that the symptoms often lie latent for years—accidents in childhood giving rise to mental disorders and criminal impulses in manhood—we are bound to admit that, in certain cases at least, it is the expert physician who should determine the cause of the crime, the responsibility of the criminal, and his treatment, and not the judge and jury.

From the cases quoted in Chapters XXXI. and XXXII. it is also evident that the cure of criminal impulses when due to focal brain irritation or disease can be promised with full certainty; and if this be so, it is not a wild speculation to assert that even the ordinary habitual criminal, who defies all moral treatment and the severest punishments, may one day be treated successfully—by surgical operation.

But if this procedure is considered to belong to the realms of imagination, it cannot be denied that the evidence collected in this book, should it receive confirmation, will help us to take a great step towards the prevention of crime, not only because it will enable us to determine with increased certainty the diseases which give rise to criminal impulses, but because it will enable us—most important of all—to recognise "criminals who have committed no crime as yet"—at an early age, before they have acquired facility in crime.

SECTION IV

UNEXPLORED POWERS OF THE MIND

CHAPTER XXXVI

THE POWER OF SUGGESTION

In the preceding chapters an attempt has been made to explain the nervous mechanism of mind and character, and such an inquiry is apt to lead to the false belief that all our thoughts, emotions, and actions originate in and are dependent upon the machinery of the brain and nervous system. This is true to some extent; but only to some extent, namely, as regards the primary elements of mind and character. Let me repeat again: We cannot see without eyes, hear without ears, nor think or feel or act without a brain. But what that sight, hearing, thought, feeling, or action is to be is not predetermined. Moreover, it will be shown presently that there are mental capacities which seem to be beyond physiological explanation. Meanwhile, let us consider one source of thought, feeling, and action, which is not the result of automatic brain activity, but which is "suggested" to us.

Suggestibility is a characteristic of human beings. In the ordinary acceptance of the word, there is *suggestion* each time that a person evokes, most frequently by speech, in the mind of another person an idea to which the latter has not been led by the natural course of his thought, an idea susceptible of exercising some influence on his feelings or conduct. Nothing happens to us amiss. There is no such thing as non-significant experience. Every bit of experience, the seemingly most insignificant quite as much as the tragically significant, has a suggestive force for us; whether for good or ill must depend upon its nature and our personal handling of it. We are surrounded by a suggestive atmosphere which we breathe constantly, and which impregnates unconsciously our whole being. Suggestion emanates from our environment, from our associates, from all the persons with whom we come in contact. Without suggestibility social life would be impossible. It enters into every act of life, colours all our sensations with the most varied tints, leads our judgment astray, and creates those continual illusions against which we have so much trouble to defend ourselves, even when we exert all the strength of our reason. Men who pride themselves on their power of resisting external influences are often the most suggestible in every other department of life, except that in which they resolutely determine to be unlike other people. For example, it is not uncommon to find amongst genuine scientific men the most credulous spiritualists.

We pretend to be intelligent beings; nevertheless, if we want frankly to examine our conscience, we shall find that it is difficult always to see clearly, and that daily we are the victims of unreasonable suggestion. As soon as we leave the firm ground of mathematics we experience an incredible difficulty in resisting suggestion. When we formulate an opinion, or when we allow ourselves to be persuaded, it is very rare

that logic is the only cause. Our feelings, affection, esteem, the awe and fear which those who are talking inspire in us, surreptitiously prepare the paths of our understanding, and our reason is often taken in a trap. Our sensibility intervenes, our feelings and our secret desires mingle with the cold conception of reason, and, without being conscious of it, we are led into error. We let ourselves be captivated by a superficial eloquence, by the charm of language, and we yield at the first beck of attraction. Somebody's optimistic reflection can give us strength, and, on the other hand, his ill-humour can take away all our enthusiasm and energy. To the vast majority of mankind thinking is an extremely difficult and unpleasant process, consequently the ready acceptance of the opinions of others—especially those expressed in print. Thus the newspaper, with its leading articles and garbled news, provides an easy escape from this painful duty.

We are all open to suggestion, but some persons are disposed to allow themselves very easily to be influenced by others. On the other hand, we meet with people who know how to subject others irresistibly to their influence. Only two sorts of people are less receptive ; on the one side, those with stubborn limitations, and, on the other hand, personalities of the commanding type. All those who stand in between these two extremes, that is, the overwhelming majority, are malleable in a high degree. But even the most resolute characters are influenced by suggestion, when the suggestion is made artfully. The idea need only be introduced discreetly and gradually in order to succeed. By indirect suggestion the subject has no consciousness that his views are being modified.

A message conveying a sudden joy or a great misfortune often produces extraordinary effects beyond all bounds of reason, and the measure of pleasure we get from life—altogether—depends more on our suggestibility than on any other factor. Some people can be happy even in misery, and millionaires have been known to commit suicide because of the loss of a comparatively small fortune, often only from fear of loss and not actual loss. Books are often bought because of their suggestive titles ; fashionable clothes are worn because of the suggestion of wealth and respectability. Certain foods, the habit of open or closed windows, and other idiosyncrasies and hobbies often create pleasure and comfort, or displeasure and discomfort, not because of their actual effects, but by suggestion. The mere suspicion suffices to set up the greatest agony.

Moreover, suggestion lies at the bottom of all forms of moral and religious teaching. It is, in fact, the basis of education. It has been practised on all of us, sometimes reinforced by the application of more or less violent bodily stimuli, which help to impress the suggestion more deeply on our minds. The training of children is almost wholly by suggestion. Next to the parental influence, the suggestions received during school-life have the greatest influence on the formation of the future character.

There are certain classes of persons whose intellectual labours are characterised by suggestibility in a very marked degree. An artist's greatness depends to some extent on his power to create particular feelings in those who contemplate his work. What can flatter an author more than to hear that his novel made men and women laugh or cry, or was effective in creating good morals or wicked conduct ? After the publication of Goethe's " Sorrows of Werther " there was an epidemic of suicides in Germany. And what is the object of the dramatist and actor but to suggest certain thoughts and feelings to the audience, and to make them think, laugh, or cry ? And although the transferred emotion may be suppressed, and is usually not lasting, with a few it is sometimes strong enough to prevent their enjoying their supper and sleep that night.

Even in business suggestion plays an important rôle. The best salesman is he who can dispose of goods that the purchaser has no intention of buying—at any rate, not at the price asked. The best buyer is he who can make a man part with his

goods at a figure which he regrets as soon as he leaves his presence. A successful salesman must first gain the customer's attention, then arouse interest, and then awaken desire, after which the sale may be concluded. Again, the art of advertising depends almost entirely on its power of suggestion.

In **politics,** as in daily life, people follow a leader, sometimes against their real interests and convictions. Think of the extraordinary influence of a strong personality like Napoleon, Bismarck, or, say, Gladstone. A few cleverly-chosen words may suggest to a whole mass of people a political truth or untruth—people not stopping to inquire the reason, but following the suggestion like a flock of sheep. The voter as he reads his newspaper may adopt by suggestion the words which are made habitual by repetition every morning, conveying not only political opinions, but whole trains of political argument. At political meetings the emotions of the voters are skilfully played upon by the leaders and speakers, and the current of personal magnetism and suggestion spreads over the body of the party until they become a mob possessed of certain fixed ideas. Just as in the Middle Ages there arose epidemics of hysteria, so it sometimes happens that a whole country has lost its political judgment by some powerful suggestion that blows like a wind of folly over the land. Note the power such words as liberty, country, empire, justice have when flung at a political audience! They are mere words; but they are vast in their suggestion, and will inspire multitudes to tremendous actions.

History, and more particularly the history of civilisation, **affords striking instances of the mighty effects of suggestion.** Whether we are dealing with social, religious, or political events, or with artistic tendencies and scientific currents of thought, the suggestibility of crowds throws light on many phenomena. It is feeling that sways a gathering of people, not reason. Mobs will commit acts that no one man of them would think of perpetrating. These whirlpools of emotional excitement, of whatever kind, are strengthened by the constantly repeated suggestions of those participating in it, which, with the constantly growing volume of mental energy being thrown forth, serves to add fuel to the fire. That is why a theatrical performance is enjoyed more when the house is filled than when only half its seating capacity is used.

Suggestion is the cause of the movements and actions of crowds. A word or a cry may seize a whole mass of people in its suggestive grasp, so that it is carried away to acts of destruction like a wild and will-less herd. It will be shown presently that for a suggestion to be successful, the receiver must be in a passive, relaxed state. If the receiver is active, a suggestion gets no hold of him, his brain is too much occupied with its own ideas. So also a voice in a dense moving crowd will not attract attention—the person is carried away by the throng against his will; but let the crowd stand still and be quiet, that same voice may carry the people. It has also to be noted that just as hypnotic suggestion is especially effective if it accords with the character of the subject, so suggestions given to a community, nation, or race are fatally effective if they harmonise with their own bent of mind.

Our character acts on us as a constant suggestion. Every man, of necessity, sees other men and nature itself through the prism of his own individuality. Thus the pessimist is convinced deeply that evil is everywhere, when it is, above all, in himself. Consequently the value of having an ideal, some aspiration, whereby to oppose the suggestiveness of inherent characteristics and attractive temptations, and shape our conduct with the voluntarily chosen goal.

Tennyson's poem of the "Two Voices" is no poetic exaggeration of the duality (dual personality) of which we are conscious when we attend to the mental operations of our own most complex nature. It is as if there were within us one Being always receptive of suggestions, and always responding in the form of impulse—and another Being capable of passing these suggestions in review before it, and of allowing or disallowing the impulses to which they give rise. This dual personality

is never wholly wanting even in the most degraded of human beings—their thoughts everywhere "accusing or else excusing one another."

It is a peculiarity of the subconscious mind that it is highly amenable to suggestion. It *receives* suggestions not only from external sources, but from the conscious mind itself; and it *gives* suggestions not only from our past experiences, but from the experiences transmitted from our forefathers. Looked at in this light, **heredity may be regarded as a mass of potent suggestions transmitted from our ancestors.** We do not inherit ready-made qualities, such as virtues and vices; we only get from our parents more or less well-constituted brains, capable of reacting more or less promptly and accurately to the various stimuli which cause its activity. Suppose, for instance, an infant to be born with a predominant tendency to the feeling of fear; that feeling, as reason develops, will become intellectualised; and, if no counteracting tendency is present, it will form the ruling idea for his guidance, it will act as a potent suggestion, and his characteristic will be *circumspection*. And so all our deep-seated feelings and instincts can become intellectual qualities, which we think we make for ourselves, whereas in reality they are hereditary suggestions to determine our conduct.

Children are almost purely subjective; and no one needs to be told how completely a suggestion, true or false, will take control of their minds. Their good manners are easily destroyed by bad company, and their minds can be corrupted by what they see, hear, and read. Often a child is frightened at dusk by someone pretending to be a ghost or the devil. The fright and the image of the ghost remain in the memory, appear in dreams, and terrify the child afterwards on every occasion; for now the slightest hint or the most insignificant incident gives new life to the memory. The child does not fear to go into a room because it is dark, but because he has a mental representation of danger. In consequence phobias and hallucinations may arise.

Looked at in this manner, we are a mass of suggestions—suggestions from within (the subconsciousness) and suggestions from without. One can overcome the other, but it may be laid down at once that **external suggestions act on us more readily when they are in harmony with our internal ones,** that is, when they are in harmony with those auto-suggestions which conform with our natural character. When the subconscious mind is confronted by two opposing suggestions, the hereditary auto-suggestion and a suggestion from another person, the stronger one necessarily prevails. Thus a man with settled moral principles will successfully resist the suggestions of crime and immorality; for moral principles constitute auto-suggestions, the strength of which is proportionate to that of his moral character.

Suggestion in the widest sense can be direct or indirect, but direct persuasion is not usually regarded as suggestion. As Prof. BECHTEREV has cleverly said: "Suggestion enters into the understanding by the back stairs, while logical persuasion knocks at the front door." **Suggestion,** in this more restricted sense, is **a process of communication of an idea to the subconscious mind in an unobtrusive manner, carrying conviction, when consciously there is no inclination to accept it, and logically there are no adequate grounds for its acceptance.**

There are people who scarcely ever act from motives originating within themselves, but whose entire lives are lived out in obedience to the suggested ideas and feelings of others. All persons are more or less amenable to suggestion, not merely in hypnosis but in the ordinary waking condition. Examples have been given of this universal suggestion. Other illustrations of it are: gaping involuntarily, even against one's strenuous attempts to avoid it, on seeing another yawn; beating time unconsciously on hearing the measured throb of martial music; becoming wildly excited for no other reason than that one's companions are panic-stricken; and, contrariwise, having one's fears allayed by the tranquil appearance of his associates

in a terrible emergency. With many people the mere statement that they are blushing is enough to produce a flow of blood to the face; the repeated assurance that they are warm or cold will tend to make them feel warmer or colder; the mention or the sight of certain little insects which inhabit the bodies of uncleanly persons seldom fails to make the skin itch uncomfortably.

Suggestions almost invariably appeal to the feelings, and we are always more willingly and readily influenced by our feelings than by our reason. A suggestion causes a feeling to spring up from the subconscious state of the mind, in response to the exciting cause coming from without. Words in themselves are not really suggestive; they possess no magic power. All their force and effect depends upon the associated feeling. The more feeling we throw into our words, actions and manner, the better they will suggest. When suggestion acts through the association of ideas, it is based upon the acquired impressions of the race, by which certain words, actions, manners, tones and appearances are associated with certain previously experienced feelings.

Suggestions convey ideas, and ideas are symbols of something thought or felt. The majority of ideas held in the mind of the race arise from feeling. People may not understand things, but they have experienced feelings or emotions regarding them, and have consequently formed many ideas therefrom. They do not always know the reason why an idea is held by them; they know only that they feel it that way. And the majority of people are moved, swayed, and act by reason of induced feelings, rather than by results of reasoning. It is true that suggestions may accompany an appeal to the reason or judgment of the person influenced, and, indeed, are generally so used; but, strictly speaking, they constitute an appeal to a part of the mind entirely removed from reasoning and judgment. They are emotional first, last, and all the time.

Suggestion may act through obedience to a person in authority, whether real, assumed, or self-constituted. Reason is quiescent because of our faith in his authority. The authority induces the mental states for such people by "boldly asserting" and "plausibly maintaining." Some people will obey any authoritative tone and manner. They are most effective on those who have never used their own wits and resources in life, but have depended upon others for orders and instructions. The degree of suggestibility along these lines decreases among people who have had to "do things" for themselves, and who have not depended on others so much.

A suggestion is more likely to be successful if made by a person who is trusted, loved, or feared, or under circumstances that inspire these sentiments, or in a tone of voice or with a manner that the subject has always associated with ideas that are to be acted on or believed. One or other of these qualities, or more often a combination of them, is an invariable characteristic of the person who is suggestive. All have noticed that some individuals seem to have a "winning way" about them, and are able to induce others to fall into their way of thinking or desires, and to do what they wished done. Not only on the stage, but in the pulpit, on the platform, and in the councils of the nation is quality of voice all-important. Few men are convinced at once by logical argument, but their feelings are turned in favour of a speaker who with his own varying tone of voice can appeal to the emotions of his audience. Thus quality of voice counts for more than we suspect in the relations of daily life. The speaker's power to move us depends upon his being able to create in us the feeling by which he is or pretends to be moved, and thus to cause similar vibrations in our own nervous system. In this respect we are like so many musical glasses. We ring when we are in unison with the exciting object, but not otherwise. *Only words that come from the heart can reach the heart.* For this reason a speaker who speaks out of the fulness of his heart will be more suggestive, will create more nerve vibrations amongst his hearers, than another man who has the same amount of feeling but cannot convey what he feels in the same manner.

Domestic and other quarrels often arise not because of the words spoken, but because of the voice in which they are conveyed.

Suggestion may act through imitation. Man is an imitative animal. Many of us imitate without reflection. It is only when our attention is roused to the habit by a third person that we become really conscious of it and reason upon it, with the result that we correct it. Few of us can for long be with people who have peculiar habits of movement without feeling a tendency to imitate them. As is well known, stammering is frequently communicated from one child to another. In matters that are not of vital importance to the conduct of life, such as fashions in clothes and in food, we slavishly imitate our neighbours; and even in weightier matters, such as systems of belief or moral standards, we tend to adopt without question those that we find around us.

Suggestion may act through repetition. Repeated shrugs, sneers, and insinuations of gossips have destroyed many a reputation. Constant dropping of water will wear away the hardest stone. There is weakened resistance through repetition of the attack, the force of habit. We have heard certain things affirmed over and over again, until we have come to accept them as veritable facts, notwithstanding that we possess not the slightest personal knowledge of, or any logical proof concerning, them. Thus public opinion is moulded.

Reason and judgment must be in abeyance in order that a suggestion should act; hence **suggestion may act by the suddenness with which it is made,** which gives no time for observation and deduction, and causes a suggestion to be accepted and immediately acted upon.

Tell a lady comfortably seated in an armchair that there is a mouse crawling up her dress, and her mind will be immediately filled with the idea to the exclusion of everything else, and she will instantly jump up. The idea through its very suddenness overflows into action at once before critical ideas are able to arise. In addition, the idea, a repellent one, by its suddenness gives a shock to the mental system, and tends to render dissociation easy. In this case, therefore, the conditions are (1) rapidity of presentation, which does not give the contrary ideas time to arise; combined with (2) the shock of presentation, which helps to hinder them from making a protest.

The ability to maintain **a passive state has a predisposing effect.** There are many persons who are by nature given to passive submission to external influences, and therefore are in a highly susceptible condition to every form of influence from without. But it would be a mistake to consider the disposition to suggestion a sign of weakness of will. The cleverest men, because of their capacity to forced concentration of attention, excluding all other external impressions, are often the most susceptible. This ability to give the thoughts a certain prescribed condition is partly natural, and partly a matter of training and habit. Of course, there are men who possess a natural credulity, and are not disposed to make conscious logical deductions, and many men will believe what they want to hear, or what they have expected to happen.

Auto-suggestion, which, strictly speaking, is not a good term, although in general use, means a suggestion originating within the individual. It may be either a suggestion from the conscious self to the subconscious self—a self-imposed narrowing of the field of consciousness to one idea, by holding a given thought in the mental focus to the exclusion of all other thoughts, as, for instance, when I concentrate before going to sleep on the one thought that I shall rise the next morning punctually at seven o'clock; or it may be a suggestion arising from the subconsciousness, owing to hereditary ancestral tendencies or acquired experiences, and dictating to the consciousness, such as the fear suggested to most of us when we sleep in a remotely situated empty house. All suggestions are in reality auto-suggestions, for without

the acceptance by the subject they produce no effect; only that the idea comes from outside, and not from the mind of the subject.

Every man can develop the power of determining and controlling his thoughts, the power of determining what types of thought he shall and what types he shall not entertain. For let us never fail to remember this fact, that every earnest effort along any line makes the end aimed at just a little easier for each succeeding effort. Owing to our wonderful reflex nervous system, whenever we do a certain thing in a certain way it is easier to do the same thing the next time, and the next, and the next; until, finally, it is done with scarcely any effort on our part at all, and thus we establish a habit. Life is, after all, merely a series of habits, and it lies entirely within one's own power to determine just what that series shall be. It is true that everybody is born with certain predispositions, and that these predispositions influence very strongly the early formation of habits and of thought; but the fact remains that the character is built up by long-continued habits of thought.

Our dominating thoughts determine our dominating actions. These actions repeated crystallise themselves into our habits. The aggregate of our habits is our character. Whatever, then, we would have our acts, we must look well to the character of the thought we entertain. Whatever act we would not do—whatever habit we would not acquire—we must look well to it that we do not entertain the type of thought that will give birth to this act. Our character is thus dependent on the thoughts we entertain. By the thoughts we think, we create an atmosphere around us by which other people are influenced. If we continually think thoughts that are good, our life will suggest goodness; if we continually think evil thoughts, our life will suggest evil. If we are sad, it is a sad world; if we are happy, it is a happy world. A great deal depends upon the individual himself for weal or woe; to a large extent we create our own condition—the heaven or hell we have to live in.

All this sounds easy enough, but the question is sure to be asked: If so much depends on our own thoughts and auto-suggestions, why is there not more happiness around us? The answer is: Because most people have not their own thoughts under control. They lack mental discipline and concentration. In order to concentrate we must be masters of our brain, and not allow the brain to master us. The brains of most men are undisciplined and unreliable.

One of the most potent factors in man's existence is auto-suggestion. Thoughts that are dwelt upon strongly soon recede from consciousness to subconsciousness; from whence, without any effort from our conscious self, they nevertheless influence our actions and determine our progress or retrogression, our success or failure. Of the great good that may come from conscious self-suggestion, the examples of those great men who have, through the self-suggested ideal that moved them, extracted a gigantic life-work from a grudging brain, speak to us with lofty eloquence.

On the other hand, there are people who allow the mind to be controlled by one dominant impression of past experience, which subordinates all others. They bring about their own misery and waste their existence by dwelling upon, lamenting and brooding over past misfortunes and past mistakes. Hopelessness, fear and depression are not merely moods and sensations of no consequence, but are terrible realities, and the more we indulge in them, the more they become impressed upon our surroundings as well as our subconsciousness, and the more permanent is the deadly mark they make upon our lives.

There are people who magnify the obstacles which rise before them, who are discouraged by the smallest failures, to whom the slightest happenings are catastrophes. They are overcome by a telegram before having learned its contents; they read between the lines of a letter, and ascribe to any occurrence whatever the least probable and the most terrible causes. Others are given to anxious, uneasy observations of the body, producing a crowd of auto-suggestions of symptoms of diseases, of pains and sensations of all sorts, exactly as though a real organic trouble

were present. The human suggestibility reinforces and even creates our sensations. Conscious effort and a fixed determination are necessary to overcome such a wretched and mistaken existence.

I regard the hypochondriacal patient, the patient with obsessions, morbid fears, psychic inhibitions, as suffering from excessive self-suggestibility. The neurasthenic suffers perhaps not so much from lack of energy as from misdirected energy. Drink or drugs, if they monopolise the man, are also a form of mono-idea dominating too much of consciousness, and have therefore the power of auto-suggestion. These people take time before they are amenable to suggestion treatment, because their self-suggested ideas are stronger from long indulgence than those conveyed by the operator. It is only after careful analysis of the mental processes and habits and character of the patient that we are able to exert any influence and bring about a normal attitude towards the thoughts which continue involuntarily to occupy the patient's attention, when they cease to lose their emotional value, and gradually disappear.

The auto-suggestion arising from our subconsciousness accounts for much self-deception. For instance, the wine which we pour out of a dusty bottle bearing the label of a celebrated vineyard always seems better than it really is ; a connoisseur among smokers will let his judgment be influenced if he recognises the make of the cigar that he is smoking. Some people feel already sick when the ship is still lying motionless in the harbour. It is also well known that the auto-suggestion of fear in the case of epidemics renders one more liable to contagion.

If we see in a place where we might naturally suppose a cat to be a grey mass about the size of that animal, we do not often take the trouble to test this perception, and we affirm the existence of the cat with a conviction which would draw other persons into error. Question eye-witnesses concerning the details of some event at which they were present, and you will find that they have all seen differently ; because they have all looked through the spectacles of their understanding, distorted by preconceived opinions and auto-suggestions. Judges and lawyers know how little credence they can often give to the declaration of even disinterested witnesses.

Enough has been said to prove that suggestion, from both within and without, is a process constantly at work amongst us. The next step is to examine the methods of employing it for practical purposes.

Suggestibility is the characteristic of all human beings, but **there are methods which increase that suggestibility.** The best known is that of hypnotism. There are two aspects of hypnotism, which must be kept distinct : one, the value of the study of its psychological phenomena ; the other, the value of hypnotism as a therapeutic agent for the amelioration and cure of certain nervous and mental disorders of a functional kind. Hypnotism being practised almost exclusively by medical men nowadays, greater stress has been laid on its therapeutic value than on the value of the psychological phenomena. For the former purpose it is not always necessary to put the patient actually to sleep, but often a somnolent state suffices, a condition of objective passiveness consistent with consciousness, a mental state of calm and physical and mental relaxation, which causes the patient to become receptive to the impressions that we wish to make upon his or her mind. This passive state simply means the suspension of the functions of the conscious state of mind for the time being, for the purpose of allowing the subconscious mind to receive impressions and to act upon them. Sleep need not be induced. This method has the advantage that nearly everybody can be subjected to it. I have described this method and its effects fully in my book on " Hypnotism and Suggestion " (Pitman, London, 1910). But it is not my intention to deal here with the therapeutic application of hypnotism and waking suggestion, but to record the psychological effects which we are enabled to produce, and for this purpose real hypnosis is necessary.

Modern hypnotisers bring about this state by **suggesting sleep** to the subject, having previously made him comfortable in a quiet room, with his body relaxed and his mind freed from disturbing thoughts. The old mesmerists, of whom we shall speak presently, made the patients gaze at some object, and by means of slow passes, stroking the skin, or gentle pressure, produced the desired effect. The methods are numerous, but they all agree in certain points, namely :

(1) The fixation of attention ;

(2) An environment to produce monotony of impressions and intellectual drowsiness ;

(3) Limitation of voluntary movements by relaxation of the muscles ;

(4) Limitation of the field of consciousness by allowing no new incoming impressions ; and

(5) Inhibition of ideas by making the mind as nearly as possible a perfect blank.

Owing to the fact that hypnotism is nowadays practised chiefly by physicians and for medical purposes, the notion is common that only sick people, or people suffering from nervous or other disorders, can be hypnotised. This is a mistake, however ; perfectly healthy people make equally excellent subjects, but healthy people have no reason to consult a doctor and therefore do not come under the observation of physicians. Nor has weakness of " will " anything to do with the susceptibility of a subject. Neither is it lack of muscular strength that predisposes to hypnosis. Strong muscular persons are equally easily hypnotised if the conditions enumerated are fulfilled. If they are not, even the feeblest person will make a bad subject. Nor are " credulous " persons necessarily good subjects. There are plenty of people who believe all that they are told, yet they often offer a lively resistance when an effort is made to hypnotise them.

EXPLANATION OF HYPNOTISM

Considering that we possess little or no knowledge of what mind itself is, it can cause no wonder that all the explanations offered hitherto for the phenomena of hypnotism are still unsatisfactory. Considering, also, the varieties of theories of natural sleep, we cannot be surprised at our ignorance of hypnotic sleep.

The power of suggestion does explain, of course, a large number of the hypnotic phenomena, and we know that suggestibility, which is so common in waking life, is very much increased in the trance. But **hypnosis is not necessarily conditioned by " suggestion."** I have frequently left boys alone in a room gazing at a glass crystal, making no other remarks but that I would come back in ten or twenty minutes—would they meanwhile keep their eyes fixed on the crystal ?—and when I returned I found them in the cataleptic state. It is possible, of course, that these boys may have had the knowledge that crystal-gazing may induce sleep ; but so far as I could ascertain they had no such knowledge or expectation. Indeed, I have found that those who are acquainted with the procedure and its effects are more difficult to hypnotise, and some resist entirely. Moreover, I shall quote a series of most extraordinary results obtained in specially gifted subjects, which were obtained free from any possibility of suggestion, every precaution having been taken by myself and the witnesses present to exclude such possibility.

My own experience strengthens my belief that **the phenomena of hypnosis are due to some inherent capacity which varies with different subjects.** A hypnotic effect is not something forced upon the subject by the will of the operator, but something evoked by the mind of the subject exercising its own powers at the suggestion of the operator. And this suggestion is addressed to the person's consciousness—mind speaks to mind. The operator only suggests the result to be accomplished ; he does not suggest the method whereby it is to be achieved.

That there is some inherent capacity for increased output of nervous energy in all of us may be shown by a simple example. For instance, I may be able to lift a certain weight; but if I will for some reason to lift a heavier weight, or not to get fatigued by lifting the same weight repeatedly, I can do so. Now, what is the power that gives me the additional strength? It is also well known that under some powerful emotion we possess increased strength and endurance. How is that achieved? Herein lies the value of enthusiasm for one's work, and of high aims and ideals. People who work only because they must, in order to live, can never do as much, either as regards quantity or quality.

In hypnosis suggestions are accepted uncritically, unless they offend against deeply-rooted convictions; other ideas are suppressed or inhibited, and, once accepted, the suggestion takes possession of the mind, and allows association to go on only within the limits that suit the controlling idea. You assure a subject that he cannot move his arm, for instance; he feels that he can, and yet he cannot. The volitional current from his higher brain centres is neutralised, as it were, by the current from other centres in which the suggestion has created a fixed idea of his own incapacity. As hypnosis becomes deeper, every trace of resistance disappears, provided the idea is not repugnant to the subject, and the fixed idea reigns supreme.

This state of credulity is an element in hypnotism which we find also in dreams. It is characteristic of dreams that the most improbable things are accepted by us without resistance. We have become so credulous that all the images which present themselves to our minds, however absurd they may be, are received as real without difficulty. In normal waking life a man can convince himself of the inaccuracy of a statement by means of his senses; and, apart from this, an idea in itself has not the same tendency that it has in hypnosis, to develop into a hallucination which dims the judgment.

In hypnosis the resisting consciousness is absent. True, a subject may resist the suggestion of an operator, and frequently does so, but it is a subconscious resistance through the habits which have been formed by him which the suggestion has, so to say, offended. The resisting consciousness being absent, the suggestion is at once transformed into action.

A subject in hypnosis will accept any suggestion, and whatever there is within range of his own knowledge or experience, whatever he has seen, heard, or read which confirms or illustrates that idea he has at his command and effectively uses, but he is apparently totally oblivious to all facts or ideas which do not confirm, and are not in accord with, the one central idea. It is obvious that a hypnotised person never uses inductive reasoning, but that his reasoning is always deductive.

In order to make a suggestion effective, and to develop, for instance, hallucinations in a hypnotised subject, a state akin to dreaming, a **dream-consciousness,** must be produced. In dream-consciousness we are subject, *firstly*, to hallucinations, that is, we believe that what we see or feel are real objects; *secondly*, our sense impressions do not produce normal perceptions but illusions, and *thirdly*, the power of judging the experiences of which we are conscious is essentially altered. These peculiarities are also common to consciousness in hypnosis.

Normal sleep is often induced in the same manner as hypnotic sleep. Children, when their sleep does not come naturally, are often talked or sung or rocked to sleep. Grown-up people, too, produce the hypnotic sleep in themselves by concentrating their minds upon the thought and expectation of sleep, or at least by excluding all disturbing and exciting thoughts.

There are other analogies between the phenomena of normal sleep and the phenomena of hypnotism. For instance, it is well known that the recollection of what occurred during hypnotic sleep is in exact inverse proportion to the depth of the sleep. If the sleep is light, the remembrance of the subject is perfect. If the sleep is profound he remembers nothing, no matter what the character of the scenes

he may have passed through. The same is true of dreams. We remember only those dreams which occur during the period when we are just going to sleep or are just awakening. Profound sleep is dreamless, so far as the recollection of the sleeper informs him.

Having mentioned the analogies between ordinary and hypnotic sleep, let us now consider their **points of difference.**

It is not true that the mind of the hypnotised person is asleep and that perhaps only one or the other idea can be pushed into his mind. On the contrary, his mind is open to an abundance of ideas, just as in the normal state. His whole mind is awake; the feelings and emotions and volitions, the memories and judgments and thoughts are rushing on, and only that is excluded which demands a contrary attitude. Therefore it is not quite fair to compare hypnosis and sleep. Though we bring it about by suggesting the idea of sleep, *i.e.*, the idea that sleep will set in, for this idea removes all opposing ideas. But the fact that belief in sleep and expectation of sleep bring with them the hypnotic state is not a proof that the hypnotic state itself is sleep. The hypnotic state may be brought about by fascination, as staring at a glaring light, *i.e.*, by an abnormally increased suggestibility without sleep.

As far as we know, in natural sleep consciousness is lost completely, in hypnotic sleep it is not, for though the subject may not remember on waking what has occurred, he recollects everything when he is again hypnotised; so that the recollection of one hypnotic sleep to another is continuous. One might compare the consciousness of a hypnotised person with that, say, of a business man who does not think all day of his home; and when home may give not a single thought to his business; but he is conscious all the time. Only that in the hypnotised person (and in the somnambulist) there is a more definite division between his state and the waking state. The hypnotised person may also be compared to a man engrossed in a play; he is perfectly conscious, and yet in a sense he is hypnotised.

Another difference consists in that the intellectual activity of our dream-consciousness is marked by the absence of logical consistency; whereas in hypnosis the capacity for logical thought is preserved, and moral consciousness is not only retained but may be heightened. In all probability hypnosis is purely a psychical state, whereas natural sleep is dependent on changes in the circulation and chemistry of the brain, or at least on physiological processes.

During sleep, the pulse, respiration, and other bodily functions are changed, but they are not in hypnosis, save in exceptional circumstances. In hypnotism the sleeper remains *en rapport* with the operator or some other person who may make suggestions, whereas in ordinary sleep, as soon as consciousness is lost, the subject is only in relationship with himself, though sometimes he can be put *en rapport* with someone. Ordinary sleep is too deep to make the influence of suggestion possible, but cases are on record in which dreams have been suggested to persons in light sleep, and also of persons who have actually been hypnotised in their sleep, so that their natural sleep was converted into hypnotic sleep. When falling into ordinary sleep the mind passes from one idea to another indifferently, and the subject is unable to fix his attention on any regular train of thought, or to perform any act requiring much voluntary effort. On the other hand, the concentration of attention, which is the result of the means employed for inducing hypnosis, is continued into the state itself, and verbal suggestions or sensory impressions excite definite trains of thought or physical movements, instead of dreams.

Under hypnotic suggestion people fall asleep without fatigue to help them, and sleep so that **even surgical operations on them do not wake them,** while ordinary sleep needs to be helped by fatigue and other physiological changes, and is often hindered by pain and pathological checks.

Besides the astounding effects of anæsthesia produced by suggestion in the

hypnotic sleep, we have an entirely new condition of the intellectual faculties. They may be much better than in the normal state (see Chapter XXXVIII.). On the other hand, there are plenty of cases on record of men who have solved most difficult problems in their sleep, which puzzled them much when awake. There are sleep-walkers who even do heavy housework in their sleep. To be sure, when they wake up they have the feeling that they have slept soundly, and yet they are very tired, exhausted, broken up. Both sleep-walker and the hypnotised somnambulist have no recollection on waking; but while the memories of such somnambulistic states are not retained under normal conditions, the hypnotic subject can remind himself of what has taken place in the condition of natural somnambulism.

In dreams we often assume quite a different personality; so in hypnotism a subject can be made to change his identity; that is to say, he can be made to forget who he is, and whatever name or character is suggested to him is at once assumed. The suggestion may be oral, and proceed from another; or it may be an auto-suggestion, arising from something suggested in a previous hypnotisation, or from some forgotten circumstance. Be that as it may, the suggested character is assumed and carried out with all the deductive logical exactitude characteristic of subjective reasoning. This is a well-known result of a common hypnotic experiment. It is also well known that the subject can be made to assume any number of characters by the same process.

The lack of sense, of logical connection, which strikes us in **dreams,** is only apparent. We have to distinguish between manifest and latent contents of a dream, and the latter, represented by the so-called dream thoughts, are far from being nonsensical, but give us important clues to the nature and workings of our subconscious processes of thought.

In our dreams, as in our illnesses, our unconscious and repressed thoughts and emotions find expression. But, as in our illnesses again, the revelations are not straightforward, the instinct for compromise and concealment makes itself everywhere apparent. In the night dream as in the day dream, wishes are fulfilled, but they are often partial wishes, and such as in our waking moment we do not admit even to ourselves. Symbolisms and innuendoes take the place of direct statement, and the possession of a treasury of dramatic power is revealed by the sleeper, of which his waking moments may indicate no trace, so deadening, even though useful, is the repression of education and convention.

Sleep is a biological reaction of defence of the organism against fatigue. In deep sleep there is an absolute repose of the brain; while, on the contrary, in deep hypnosis the brain may be exceedingly active.

MOSSO ("Sulla Circulazione del Sangue nel Cervello delle Uomo," Rome, 1880) showed that sleep was due to changes in the *cerebral circulation.* In passing from the waking state into sleep there occurs a dilatation and a relaxation of the vessels of the skin, and the brain contains less blood than in the waking condition.

W. H. HOWELL ("A Contribution to the Physiology of Sleep," *Journal of Exp. Medicine,* 1897) declared sleep to be caused by a diminished blood-supply to the brain, due to a relaxation of tone in the vaso-motor centre, thereby producing a general fall of arterial pressure.

TARCHANOFF ("Observations sur le Sommeil Normal," *Arch. Ital. de Biologie,* 1894) showed that in puppies the brain grows pale when the animals are asleep, and that at the same time the cortex reacts less readily to electric stimulation.

C. PUPIN ("Théorie Histologique du Sommeil," 1896) gave us a *histological* theory of sleep, according to which sleep consists of a repose of the nervous centres due to a difficulty in the passage of external stimuli or impressions, owing to an interruption in the continuity of the neurones by the retraction of the dendrites.

The *chemical* theories of sleep ascribe sleep either to impoverishment of oxygen, an accumulation of fatigue products in the blood, increase of carbonic acid gas, and

the formation of toxins by the tissues, which, acting on the brain, have a narcotic effect. When these products are eliminated, awakening results.

The *psychological* theory explains sleep as due to the absence of external stimuli. Only constant impressions from without keep us awake. Without them we fall asleep.

E. CLARAPÈDE ("Enquisse d'une Théorie Biologique du Sommeil," *Archives de Psychologie*, vol. iv.) advanced a *psycho-biological* theory of sleep, according to which sleep is a negative state, a cessation of all activity, and is reaction of defence to protect the organism against fatigue, rather than a physiological process the result of fatigue. Against this theory must be pointed out the fact that infants sleep nearly all the time and their length and depth of sleep do not depend upon fatigue. Moreover, sleep is periodic in character and may be postponed by excitement, interest, and even volition.

BORIS SIDIS ("An Experimental Study of Sleep," *Journal of Abnormal Psychology*, 1908) interprets sleep from the standpoint of the threshold of cell energy. According to him, monotony of sensory impressions and limitations of voluntary movement are the most important factors in the production of sleep, in that they tend to raise the threshold of stimuli. When the threshold falls, awakening follows.

ISADOR H. CORIAT ("The Nature of Sleep," *Journal of Abnormal Psychology*, 1912) performed some experiments which tend to show that muscular relaxation is the chief element in bringing about sleep, and next, that external stimulation must have reached just below the threshold of perception, so as to cease to exist for the subject. It is not the monotone of a sermon or lecture which makes us fall asleep, but we sleep under these conditions because we become inattentive. This inattention causes the muscles to relax, and this relaxation of muscles produces sleep.

Finally, we have the *secretory* theory of sleep. Our daily sleep is a biochemical phenomenon, whose function is the nutrition of the central nerve elements, and consequently those tissues which depend upon the activity of the nervous system rest likewise during sleep. Sleep is therefore really a biological reaction of defence against starvation. The primary psychic condition for sleep is disinterestedness and inattention. Sleep is a negative state, a cessation of brain activity, an instinct. This instinct consists of a periodic relaxation of muscular tonus, which becomes automatic by habit. When we sleep we take the position in which there is the least muscular tension.

All secretions are regulated by psychic stimuli. The desire to sleep is brought on by a gland or secretory apparatus, which has a periodic activity. The principal factor in sleep as in secretions is the periodicity. Disorders of sleep are very frequent in those diseases which interfere with the internal secretions. According to the secretory theory, sleep is essentially a mechanism for the repair of the neural elements, which cease their activity during sleep—"sleep is a vegetative function, a function of secretion, intimately related to the functional activity of certain special organs of internal secretion. Deep sleep is an absolute repose of the brain, in which there follows a slowing of the metabolic processes of the entire body."

DISSOCIATED PERSONALITY AND TREATMENT BY PSYCHO-ANALYSIS

We come across in actual life cases of *dual* or *multiple personality*, and they are regarded as very wonderful, but there is more than one personality in each of us, as we happen to find out when great trials in life have brought out a particular side of our character of which we were not conscious, and which was unknown to our friends.

The person assumes a new name and a new character, the last being often in marked contrast to the normal one in every essential particular. The old personality is sometimes completely forgotten, and sometimes it is remembered only as a person whom the patient has once known. In some instances the two personalities alternate at somewhat irregular intervals, and persons have lived for years in an alternation of two characters, in one of which they forgot all they had ever learned

in the other, and they have had, therefore, to be educated like children in the former. In others, the phenomenon occurs only once in a lifetime. In others, several different personalities will be assumed at different times.

The subconscious, or secondary consciousness, is impersonal, but may be crystallised into a personality, usually only evanescent; but if more stable and growing in strength it forms a *dissociated personality*, which may obtrude itself on the primary consciousness, producing two personalities of equal rank. Two, three, or even more personalities may be formed and be co-existent within the subconsciousness. We have then not only a secondary, but a tertiary consciousness. There are no sharp divisions between consciousness and unconsciousness; but, as a rule, one shades imperceptibly into the other. It is only when a part becomes dissociated that it appears quite distinct, and even then it has been proved that memories of the other personality are not quite extinguished.

We have pointed out already that impressions, thoughts, and actions, of which we have no conscious memory, may, nevertheless, exert a strong influence on present ideas and conduct. Many persons are moody, morose, melancholic, excitable, irritable, solely because of the overpowering influence of some picture of past experience, which remains unconsciously in operation after conscious thought on the occurrence has ceased and the person has apparently forgotten the incident.

In normal everyday life disagreeable or painful thoughts are generally forgotten; we intentionally or even unconsciously push them out of consciousness, so as to free ourselves from disagreeable feelings or pain. Sometimes, however, a disagreeable incident remains in our unconscious memory. Then, because we have no control over it, it cannot run its normal course, and therefore becomes converted or changed into a pathological condition. Sometimes it is a desire arising from a highly active instinct which for conventional or other reasons had to be suppressed, which remains in subconscious regions and disturbs the nervous functions. Thus a conflict or disharmony is set up between the main stream of conscious personal life and the submerged or subconscious mental state. There is a lack of unity in the inner life, because this suppressed thought or emotion is not at one with the personality as a whole. If these repressed emotions are given an opportunity to complete themselves, if by a particular process of examination they are brought before consciousness, they cease from doing mischief. The method of digging out this buried complex and bringing it to light or consciousness, and therefore to conscious control, is called **psycho-analysis.** This process throws light upon the origin of habits and idiosyncrasies of all kinds and upon many obscure problems of everyday life. The instinctive dislikes, which so frequently influence conduct for no obvious cause, mannerisms and odd gestures, uncalled-for explosions of temper, inexplicable waves of sadness, sudden untimely merriment, blind unreasoning prejudices, are to be attributed to past experiences and old conflicts, which, though quite forgotten, may be discovered by psycho-analysis, and over which, when understood and frankly faced, healthy influences have a chance of prevailing.

Desire, craving, conflicting emotions, maladaptation to instinctive reactions, play an immensely important part in functional disorders. The activity of the repressed complex is often manifested in some distorted form that is hard to recognise. The psycho-analyst has to study the various mannerisms, symptomatic movements and tricks of behaviour, and slips of the tongue or pen, which reveal the automatic functioning of the repressed train of thought. He has to unravel the confused end-product and to bring about an intelligent synthesis of the disturbed personality; for which purpose he needs essentially a sympathetic insight into the patient's character. But psycho-analysis, in my opinion, has been pursued hitherto in a one-sided manner. **It is not the disclosure of the repressed psychical event that is important, but the discovery of the underlying motive.** *All* the active propensities and sentiments may be repressed. Repressed "greed," "love of approbation,"

"envy," etc., are just as common as repressed "libido sexualis," to which the Freudian school has attached exclusive significance. We must therefore ascertain first of all the *natural character* of the patient by an ethological examination. Without a knowledge of the congenital dispositions, psycho-analysis means groping in the dark, and at best such a lengthy proceeding that little good can come from it.

In real life there are in all of us three personalities: one known to ourselves, one to our neighbour, one to God. Our personality undergoes every instant modification, which we scarcely perceive, but which is none the less real. We are ourselves only because we remember our past. Our whole past lives in us, reacts upon us, gives us the notion of ourselves, constitutes us a special being, distinct from all others and connects by a long chain, which has no break in any of its links, the whole of our long past to the short present moment.

When we have arrived at old age we are no longer identical with the person we were at the time of infancy, youth, or mature age. However, since at no moment of that long period has there been a psychological interruption between the preceding and the present states, we say that we have always remained the same person. This is not altogether correct; for if, looking back on ourselves, we try to imagine what we were ten, or twenty, or forty years ago, we perceive such differences in ourselves that we sometimes have difficulty, when we find writings or memorials of our past, in saying that they belong to the same person.

SUGGESTION IN THE WAKING STATE AND ITS RESULTS

There are **different degrees of hypnosis.** We are not here concerned with the lighter hypnotic state—the somnolent state—which is the stage usually employed in treatment. Nor are we here concerned with that deeper stage in which catalepsy, constrained rigidity of the muscles and general loss of sensibility take place. What interests us is that state of hypnosis in which the subject ceases to be in relation with the outer world, hears principally, if not only, what is said to him by the operator, believes all his statements and carries out his wishes promptly—in short, the state of somnambulism.

By means of hypnotism we can influence the somatic activities: the action of the heart, the circulation of the blood, the secretion of the glands, the working of the internal organs in general. I have succeeded in affecting intestinal stasis, amenorrhœa, chronic neuralgia, chronic muscular spasms; even the pain and sleeplessness of persons dying of cancer, when morphia injections would no longer act. Yet of late I have been able to achieve the same results without any conscious attempt at inducing hypnotic sleep, but solely by verbal suggestion. Certainly for purely psychical disorders—mental obsessions, morbid fears, uncontrollable impulsive actions, stammering, morbid blushing, drink and drug habits, abnormal sexual inclinations, lying, thieving, and other perversities—hypnotism is not always necessary, and I rarely induce it. The suggestion-treatment is directed to remedy the lack of moral strength that underlies the patient's sufferings, want of discipline and self-control. It is also directed to increase his self-confidence, improve his memory and concentration of attention, and give him application and perseverance. Medical and hygienic remedies are of course applied whenever necessary.

The will, far from being weakened, is strengthened by this method. Many patients have a clear conception of what they ought to do, but have not the power to do it. Suggestion increases the power of transforming the idea into action; teaches them again to "will." But the desire must be there. A criminal cannot be changed into an honest man if he does not want to reform; we can only effect that change if he wishes to become a normal man, but has hitherto found temptation too strong for him. The same condition applies to the drunkard and all the others who give

way too readily to their inclinations. Suggestion-treatment does not act on the degenerate, because he lacks the desire to reform.

Suggestion in the waking state is all that is required, if by suggestion we include re-education of the character, the teaching of mental discipline, the getting rid of all mental and moral hindrances, and the insertion of powerful ideas and motives for hesitancy. We rouse the spirit within ; we make the subject aspire to something higher. We evoke ideals and the impulses to pursue them, and make them so attractive to the patient that they become embodied in the processes of conduct. Of course, the ideas must be practical, not utopian. By the implanting of new ideals we tap the potential subconscious reserve-energy of the patient, bring about a re-association and synthesis of the dissociated mental systems underlying the symptoms of the disease, and guide the mind of the patient to self-realisation and self-perfection.

Physicians do not trouble enough, as a rule, about the patient's attitude of mind. Most people have fallen into a mechanical habit of thought, just as they fall into a mechanical habit of body. They must regain conscious control of their mental and physical powers. We have all our habitual conceptions and are unwilling to receive ideas opposed to them. The physician must clear away the impeding habit of thought which stands between the patient and conscious control. He must clear away the preconceptions. For example, certain work may be hard for some, because of a preconception that it will be hard. For this purpose, no strenuous effort is needed on the part of the patient ; only the conscious wish, the conscious desire is needed to bring about its adequate performance. Singleness of purpose is necessary, more than concentration.

The strength of the theory of development depends on the principle that all that is " purposeless " in nature suffers elimination and destruction ; whereas all that is fitted and built to attain its ends survives. Similarly living without aim leads to destruction, and a fixed aim leads to development. As nature works skilfully towards her ends, so must man. When we consider that the brain contains numerous independent centres, we begin to perceive that human consciousness may be only like a great amorphous deep through which contradictory currents are for ever flowing. Therefore the need of steadfast aims. Some men live continually for the gratification of their senses. But the more intermittent a pleasure is, the more vivid will it be. Unless it has ideal elements, it will have no persistence. The enjoyments connected with our sensuous life perish with the fatigue of sense, and must be for ever renewed ; but if an ideal impulse and some intellectual elements are mixed with a pleasure, it has a chance of survival. For example, the gratification of the sex instinct is a mere temporary pleasure ; love is lasting.

We must take note of the patient's intelligence and character, prejudice and beliefs, preferences and dislikes, family life and social surroundings, ambitions and prospects, sincerity and energy, memories and fancies, experiences and habits.

All non-medical suggestive cures rely mainly on the emotional power of the act of believing. They are pure faith-cures. The psychotherapist who has no training and experience in nervous disorders and psychiatry, normal and abnormal psychology, may fail to distinguish the depression of the neurasthenic from the depression of the melancholic, and the obsession of the psychasthenic from the fixed idea of the paranoiac, the lameness of the hysteric from that of the malingerer and from organic lameness, the indigestion of the hypochondriac from nervous dyspepsia and the various organic disturbances of the digestive tract. Yet there are medical authorities who, both in the professional and lay press, throw suspicion and ridicule on psychotherapy, with the result that they drive patients from the qualified physician to the advertising quack who never received any medical training.

For actual hypnotism, which is rarely ever needed, a certain gift is necessary,

without which one cannot succeed. It is dependent not on suggestion merely, but on the manner of making the suggestions. It is those who fail who are adverse to its use, even by practised medical men, and they exaggerate its dangers, which exist only in the case of unscrupulous persons.

Cures by suggestion are all the more remarkable because the physicians who specialise in that treatment obtain their patients frequently only after a number of other medical men have tried their orthodox remedies and failed. I have seen inebriates who have been treated in various institutions, hysterics who have undergone Weir-Mitchell and other treatments, neurasthenics who have tried tonics, massage, electricity, and every other possible method, and I have even taken suitable insane patients out of asylums and succeeded with them. Of course, neither I nor anyone else succeeds in every case ; but this much I can prove, that the percentage of recoveries is astonishingly great, and the recovery is, in most cases, permanent ; as one can expect, considering that we aim not only at treating the constitutional defects, but at a thorough change of the character of the patient.

Such a method implies an accurate insight into the mentality of the patient as can only be acquired by a knowledge of psychology, ethology, and long experience. It requires also sympathy, patience, faith, and hope—and last, but not least, more time than the average consultant and physician is able to give. Without these qualities a physician had better not attempt psychotherapy.

Unfortunately a large proportion of the medical profession still looks askance at psychotherapy. To many it is identified with hypnotism and its popular performances of the past ; to others it suggests Freudian psycho-analysis, with its stress on sex confidences ; to some it is a mere verbal suggestion too trifling to require study. The prejudice and misconception is greatly due to the fact that we have still no schools for rational psychotherapy for students of medicine, undergraduate or post-graduate. But psychotherapy cannot be taught successfully without a preliminary training in practical psychology and an intimate knowledge of human nature and human affairs.

CHAPTER XXXVII

HISTORY AND RESULTS OF HYPNOTISM

HISTORY OF HYPNOTISM

HYPNOTISM and suggestion are as ancient as mankind. They are at the root of all "mental healing." Under this generic title may be grouped the invocations of the gods by the Egyptian priests; the magic formulæ of the disciples of Æsculapius (XIIIth century B.C.); the sympathetic power of Paracelsus (1493-1541); the King's touch for the cure of scrofula; the wonderful cures of Lourdes; the miraculous power supposed to reside in the relics of Saints; the equally miraculous cures of such men as Valentine Greatrakes (1628-1700), of J. J. Gassner (1727-1779), and of the Abbot Prince of Hohenlohe; and the no less wonderful healing power displayed by the modern systems known as mind cure and faith cure. One fact, pregnant with importance, pertains to all these systems: and that is that marvellous cures are constantly effected through their agencies. Underlying all, it would seem, there is some mysterious power or principle which, once understood, would show them to be identical as to cause and mode of operation.

Going back to the earliest practice of medicine, which was solely by priests, we find the performance of faith cures by prayers and exorcisms. In course of time medicines were employed by them; but since, according to our present-day knowledge, they cannot have had any curative properties, we must assume that they were efficacious only through the medium of suggestion.

Ancient medicine, which was in the hands of the priests, and in which many more or less impressive ceremonies and paraphernalia were used, is full of this mental influence. On the red granite obelisk of the Thames Embankment, known as Cleopatra's Needle, will be found indications of psycho-pathic healing being practised 2,500 years ago. In Egypt at that time the sick were laid in the temples of Isis to await the voice of the oracle which should reveal to them the means of cure. Charlatans, according to Celsus, performed extraordinary cures by the mere *apposition of the hands*, and cured patients by *blowing*.

In the Greek temple of Æsculapius marvellous cures were effected by psychotherapeutic measures. The imagination was strongly stimulated and processions to the accompaniment of music, prayers to the god, the sanctity of the surroundings, and, perhaps above all, the personal influence of the priests, contributed to the happy results. Pyrrhus, king of Epirus, cured persons suffering from the spleen by *touching* them slowly, and for a long time, on the painful side.

The temple sleep of the sick, which practice is still in vogue amongst Hindus in India, is a means to facilitate the effect of suggestion. The sick lie down to sleep in the temple, and are told by the god in dreams of something that will cure them.

Ancient history speaks of the mysterious doings, oracular sayings, prophetic forebodings, and apparently miraculous performances of the Egyptian priests; of the Delphian oracle among the Greeks, and of the Sybils among the Romans. From what is known of the practices, the long vigils and fastings, and the peculiar attitudes and manners of the Sybils, there can be little doubt that, by various means

kept secret from the multitude, a condition similar to, if not identical with, the hypnotic state was induced ; and that the Sybils and utterers of oracles were at times really clairvoyant, and in a state of trance. Saint Justin says, "that the Sybils spoke many great things with justice and with truth, and that when the instinct which animated them ceased to exist, they lost the recollection of all they had declared."

People were brought to the temples to be healed, and after the customary incantations and ceremonies, designed to affect the imagination and respect of the primitive people, they were found to be benefited, and actually cured in time. But under and at the back of all these ceremonies and rites, the principle effecting the cure was the same principle that is being used to-day by all forms of mental healing, under whatever names it may be disguised and masked.

The secret lies in the fact that the relief comes from within the mind of the person affected, and not from the supposed source. Back of all the ceremonies and incantations, amulets and charms, relics and images, is the mighty force of the human mind employed under the mask of fancy trappings and sacred mysteries. The different forms and practices have no other effect than increasing the faith of the patient and insinuating a suggestion into his mind.

A new order of things was established with the advent of the Greek school of medicine. The priest was left in large part his authority in matters pertaining to the soul, but the domain of physical disease was snatched from his hands, never to be returned. It follows, as a matter of course, that the therapeutic methods used by the earliest physicians would be in some measure similar to those of their priestly predecessors. Thus we find in those times, both in Greece and Rome, a profession of medical men independent of the priests, who employed, in addition to unconscious suggestion, actual therapeutics directed to the mind or soul of man to get him into that mental condition which favours recovery. Thus we find **ASCLEPIADES** (128-56 B.C.) ordering merry Phrygian melodies for melancholic conditions of mind, serious Doric and Lydian tunes for maniacal patients, and **ARETAEUS** (30-90 A.D.) advising patients suffering from religious depression to listen to the playing of the flute and to have other diversions and encouragements.

The soothing application of what are called *passes* was evidently known at a very remote period ; for there is a curious passage in the works of CELSUS (25 B.C.-50 A.D.), the Roman physician, in which he states that the old Greek father of physic, ASCLEPIADES, practised light friction, as a means of inducing sleep, in phrensy and insanity ; and, what is more remarkable, he says that by too much friction there was danger of inducing lethargy.

With the decay of the Roman Empire and the growth of Christianity, religious psycho-therapeutics obtained favour again. Prayers, exorcisms, anointment, consecrated herbs and holy water, the laying-on of hands, pilgrimage to the graves of saints, etc., were all measures of faith-healing. They were greatly favoured by the belief in witches and obsession by the evil spirit, which prevailed in the XVth, XVIth and XVIIth centuries. If the world is a stage upon which the powers of light and darkness contend for the mastery of mankind, and punish and injure him by sickness and death, the most potent remedies must be those means by which such supernatural powers are invoked or controlled. Prayers and holy water, amulets and charms, magic and spells, therefore superseded drugs in the treatment of disease.

Independently of this production of particular psychic states, there existed at all times in many quarters the belief that particular individuals could influence their fellows by the exercise of certain powers. This influence could be used as well for good as for evil. Of the first use we are reminded by the **laying-on of hands** in benediction ; also by the **healing by touch** which was obtained by the old Egyptian and other Oriental nations. Numerous old monuments testify to this.

The Ebers Papyrus, also, which represents the state of Egyptian medicine before the year 1552 B.C., contains a statement according to which the laying-on of hands on the head of a patient plays a part in treatment. We see the same thing later in the cures which King Pyrrhus and the Emperor Vespasian are said to have effected. It is known that Francis I. of France, and other French kings up to Charles X., healed by the imposition of hands. The kings of England performed similar acts and thereby aroused a feeling of jealousy between the two nations. The Anglo-Saxon King Edward the Confessor was known to practise it as a royal function, inherent with the rank of kings and priests. The custom of touching for the King's Evil (especially for enlarged glands of the bubonic plague) in the Middle Ages was observed by almost every king of England for six hundred years up to George I. It was a sign of a legitimate claim to the throne. Even when kings were exiled, patients were sent after them by doctors, when medicine and the knife proved futile. Reflections have been made upon the Church of England for giving countenance to popular faith in the royal touch. Yet that sturdy man of ponderous common sense, Dr. Samuel Johnson (1709-1784), was touched by the royal hand for scrofula. Belief in the efficacy of this also prevailed among Dissenters and Puritans during the reigns of Queen Elizabeth, King James I., and Charles I., as well as among Nonconformists of a later period. Even Oliver Cromwell is said to have seen if he had the gift; while Presbyterians in Scotland (see Buckle's "History") were especially given to regard psychic power in ecclesiastic use most potent for moral and physical good.

In the reign of Charles II., a gentleman of the name of Valentine Greatarick, or **GREATRAKES** (1628-1700), acquired considerable notoriety from curing diseases by stroking with his hands. These cures were authenticated by the Bishop of Derry and many other respectable individuals. The Royal Society is said to have accounted for them by the supposition that there existed "a sanative influence in Mr. Greatrakes' body, which had an antipathy to some particular diseases, and not to others."

In the reign of Henry VII. there was a form of service to be used at the ceremony of healing. There were also various forms used in the Church of Rome, all sickness being thought due to sin and obsession.

About 1530, **THEOPHRASTUS PARACELSUS** (1493-1541) came forward with the theory of the effect of the heavenly bodies on mankind, more especially on their diseases. Out of this the theory gradually developed that not only did the stars influence men, but that men mutually influenced each other. Paracelsus distinguished functional from organic nervous disorders and gave an excellent description of the former. He used the magnet therapeutically and thus anticipated Mesmer.

VAN HELMONT (1577-1644) taught with more precision that man possessed a power by means of which he could magnetically affect others, especially the sick. **ATHANASIUS KIRCHER** (1602-1680), of Fulda, in his "Magnes sive de Arte Magnetica" (1643) treated of the curative powers of magnetism, and in his "Physiologia Kircheriana" (1680) was the first to record an experiment in hypnotism. About 1665, a Scotsman of the name of **MAXWELL** advanced a theory of magneto-therapeutics of his own. According to this theory, everybody is supposed to emit rays evincing the presence of the soul, and these rays are endowed with a vital spirit by means of which the soul performs its actions.

In the XVIIIth century, psycho-therapeutics was the recognised method of medical men, who directed their measures towards the whole body, being still ignorant of pathological anatomy and the changes produced by disease in individual organs. **F. C. G. SCHEIDEMANTEL** (1735-1796) wrote on the "Emotions as Healing Agents" (1787); **J. C. REIL** (1759-1813) ranked psycho-therapeutical cures equal to the medical and surgical ones, and advocated the granting of a third degree by the Faculties of Medicine and Surgery, namely, the degree of Doctor of Psycho-Therapeutics.

The phenomena of hypnotism and magnetism, as practised at the present day, became popularly known only at the end of the XVIIIth century, when a Viennese physician of the name of **FREDERIC ANTOINE MESMER** (1734-1815), settled in Paris from the year 1768, used them for the purpose of medical treatment and advanced a theory of magnetic emanations. He was evidently gifted in that direction from his youth, for he chose as his Inaugural Thesis for the Doctor degree "The Influence of the Planets on the Human Body" (1766). He thought this planetary influence operated by electricity; but finding that element inadequate to the solution, he subsequently abandoned it for magnetism (1774). To this he was led in the following manner. Mesmer had obtained from a Jesuit named MAXIMILIAN HEHL the secret of magnetic steel plates, which had been applied to the cure of disease with much success. Hehl thought their efficiency was in the metal itself, but Mesmer claimed that the cures he achieved were due to his method of applying them by particular manipulations, so-called "passes," which he learned from another priest named J. J. GASSNER (1727-1779), in 1766. A controversy arose, which resulted in Mesmer being opposed by the scientific authorities and obliged to quit Vienna. Soon after his arrival in Paris he published his "Mémoire sur la déconverte du Magnétisme Animal" (1779).

ALBERT MOLL has pointed out that an influence may be exercised on nerves at a certain, though perhaps very limited, distance, which was admitted also by Alexander v. Humboldt, and his opinion was concurred in by Reil. More than once the hypothesis has been put forward of electric activities being called up by mesmeric passes, instance Rostan and J. Wagner. TARCHANOFF has demonstrated that the application of gentle stimuli to the skin will excite in it slight electric currents, and that, moreover, a strong effort of concentration of the will, with the muscular contraction by which it is invariably attended, will also suffice to produce the same.

According to Mesmer himself, whose theory has been made the subject of much misrepresentation, the whole universe is filled with a fluid, more subtle than ether, just as this is more subtle than air, and air more so than water. Vibrations, he maintained, take place throughout this fluid, just as they do throughout the ether, air, and water. And just as light is transmitted by the vibrations of the ether, so, he concluded, are phenomena of another nature constantly produced by the vibrations of this all-pervading fluid. On these vibrations, he believed, the mutual attraction and repulsion of the heavenly bodies depend, and that they also determine the interchange of attraction and repulsion between bodies endowed with animal life. In the vibrations of this fluid Mesmer considered animal magnetism to reside, and he believed this universal magnetic fluid to possess great healing properties, which could be actually passed from the magnetiser to the patient. But in order to "pass" it he held what might be fairly termed curative orgies, in which science and quackery, mystery and melodrama, hysteria and somnambulism, all played their part. Princes and nobles thronged to consult the "great magician," and to treat the crowds of patients which flocked to him Mesmer gave up individual treatment and invented methods of mass treatment, like his famous "tub," and the honest practitioner was changed into a charlatan. Though good work was undoubtedly accomplished, it was discredited by the atmosphere of buffoonery in which the séances were carried on. Public sentiment turned against him and his opinions; the medical faculty condemned him as an impostor; the brand of charlatanism was imprinted upon psychic healing, which became a fruitful field for quacks and adventurers of all sorts. In 1785 Mesmer was driven from Paris. He died in Switzerland at the age of eighty-one.

Whatever they think of the views or doctrines of Mesmer, present-day critics should remember that they were the views of his time. Mesmer thought that every motion of the body, external and internal, whether in health or disease, took place

by the agency of the nerves, and the nerve action itself depended on the action of a very subtle fluid. So thought all other physicians. Mesmer believed this fluid to be itself subject to various agents, some of which are external and others internal; all other physicians thought the same. Mesmer thought that the normal state of our functions, on which health depends, is maintained by the regular action of the nerves; other physicians thought so too. Mesmer believed that the cure of diseases is effected by crises; other physicians also considered this to be the case.

In what, then, did Mesmer differ from the physicians of his age? In this: Mesmer thought that he had discovered the secret of directing at will the fluid which sets our nerves in action, and thereby of imparting to them such action as might be requisite either for the preservation of health or for the cure of disease. Mesmer, in fact, laid claim to having arrived at a better knowledge of the laws of life than the physicians who had preceded him. It was this which the Viennese physicians disputed and for which he was repulsed. Mesmer's theory may have been a mistake, but there can be no doubt that the great end of all his proceedings was the application of a remedy for human suffering. Whatever may be said against his theory, and the methods he employed, there can be no question that there was produced such a profound impression upon the system of the patient as oftentimes to effect the relief or cure of a certain order of malady. Experience has augmented our knowledge; and we now know that the same curative effects may be produced without all those pretensions, which so greatly lead to the ideas of jugglery and imposture. He was evidently convinced of the truth of his theory, for he offered it to the faculty of Vienna, but was met with disdain. Later, in 1784, in Paris, he offered it to the Royal Academy of Medicine. His pretensions were examined and again reported on unfavourably. Mesmer, in reply, wrote to the Academicians these prophetic words: "You say that Mesmer will never hold up his head again. If such is the destiny of the man it is not the destiny of the truth, which is in its nature imperishable, and will shine forth sooner or later in the same or some other country with more brilliancy than ever, and its triumph will annihilate its miserable detractors." Indeed, in 1831, after Mesmer's death, the Royal Academy of Medicine again examined his system and reported upon it. This time it summed up its conclusions in the significant statement: "Regarded as a therapeutic agent, magnetism ought to take rank as one of the resources of medicine." So great, however, was the shock of this report to the conservatism of the Academy, that they declined to print it. "We are convinced," the Commissioners announced, "that the phenomena are mainly produced by the imagination of the patients," failing to see that in that fact lay the germ of a great truth. Had they referred them to the influence of suggestion instead of the imagination, they would have been nearer the truth. The opponents of magnetism had found out a word—imagination—which explained every phenomenon, and consequently saved them the trouble of investigating the subject minutely. If imagination could produce the extraordinary, not to say wonderful, results attributed to magnetism, surely they should have studied its powers carefully. As a member of the Academy pointed out, the only one who spoke in favour of mesmerism: "If Mesmer possessed no other secret but that of being able to benefit health through the imagination, would this not always be a sufficient wonder? For if the medicine of the imagination is the best, why should we not make use of it?" The effect of this fairly favourable report caused such a deluge of occult practitioners, that soon after, in 1837, a third Commission was appointed, which pronounced definitely against Mesmer's system and impugned the intelligence of the former committee. This report killed mesmerism in France for a great number of years. Its followers were persecuted, and those of them who held a medical diploma were made to sign a declaration against magnetism under a penalty of being struck off the register of practising physicians. A number of them would not tamper with their conviction, and were struck off.

In 1812, Dr. **C. C. WOLFART** (1778-1832), at the request of the Prussian Government, examined animal magnetism, and being converted by Mesmer, introduced its treatment in Prussian hospitals.

Previously, in 1784, the **MARQUIS DE PUYSÈGUR** (1751-1825), a pupil of Mesmer, who practised mesmerism gratuitously for the benefit of suffering humanity, discovered the phenomena of somnambulism and developed in his subjects the power of clairvoyance.

In 1787, **PÉTÉTIN,** of Lyons, studied and discovered artificial catalepsy.

In 1814, the **ABBÉ de FARIA** (1755-1819)—who denied the existence of any magnetic fluid—opened a public institution for magnetism, and a few years later magnetism was practised in different Paris hospitals, including La Salpêtrière, with the sanction of Esquirol, and a number of University professors acknowledged its value in their treatises. Faria is the author of "De la Cause du Sommeil Lucide," Paris, 1819.

Mesmerism had many sincere and learned advocates in England, such as WM. GREGORY (1803-1858), JOHN ASHBURNER (1816-1878), JOHN COLQUHOUN (1785-1854), and SPENCER T. HALL (1812-1885) and others, including HERBERT MAYO (1796-1852), the eminent physiologist and surgeon of Middlesex Hospital, who wrote on "magnetic sleep" in 1837, and advocated mesmerism with an enthusiasm which cost him his position and finally drove him from London. But of all mesmerists the one who interests us most is **JOHN ELLIOTSON** (1791-1868), one of the most distinguished physicians of the period, Lecturer on Medicine at University College, President of the Royal Medical and Chirurgical Society, the first physician to practice auscultation in England and to use the now so familiar stethoscope, who employed animal magnetism in the treatment of diseases, and invited the medical profession to witness the amputation of the leg of a patient while in the mesmeric state, chloroform not having been yet discovered. He became acquainted with the subject by attending the lectures on mesmerism by RICHARD CHENEVIX, F.R.S. (1774-1830), the famous chemist and mineralogist, in 1829; and receiving practical instruction from BARON J. DU POTET (1796-1881), in 1837. Elliotson was abused in unmeasured terms by his own colleagues, and even those who had been convinced of the truth of these phenomena had not the pluck to stand up for him.

Elliotson made the unfortunate selection of two hysterical patients, the sisters O'Key, for a test examination; and like Charcot's and Luys's hysterical women, some sixty years later, they failed. Mr. T. WAKLEY (1795-1862), the editor of the "Lancet," exposed and denounced him (Sept. 1838), just as Mr. Ernest Hart, the editor of the "British Medical Journal," exposed and condemned Luys. One of the O'Key sisters was said to fall into convulsions on being touched by a piece of nickel, no effect being produced by lead. Discs of the two metals "charged with magnetism" were given by Elliotson to Wakley. Wakley gave the nickel, unperceived by Elliotson, to Clarke, another visitor, who put it in his pocket and walked to the other end of the room, where he remained during the experiment. Wakley, now having nothing but the lead in his possession, bent forward and touched the girl's right hand. As he did so, **a bystander, by arrangement, whispered audibly: "Take care that you do not apply the nickel too strongly."** Immediately Miss O'Key fell into strong convulsions; it is said, much to the gratification of Elliotson, who remarked that "No metal but nickel had ever produced these effects." Wakley replied that no nickel had been used, and upon Dr. Elliotson's indignant protest Clarke came forward and explained the trick that had been played, producing the nickel from his pocket. Wakley denounced the whole thing as a pitiable delusion. Now, I know from my own experience that **verbal suggestion is stronger than any other.** In all my experiments to test hypersensitiveness I have had to prohibit suggestions, whether friendly or antagonistic, as they inevitably spoil the result. In Wakley's case this was neglected. But Elliotson also made a mistake. He ought never to

have acquainted his subject with her susceptibility to certain metals ; then the word "nickel" would not have produced any effect. I have found it fatal to inform subjects of their doings in the hypnotic state.

Everything which ingenuity could suggest was adopted to induce Elliotson to abandon the subject, and to throw ridicule upon it, but without having any effect on Elliotson's mind. The attacks on him were carried on with so much invective and vituperation, that as a result a resolution was passed by the Council of University College to the effect "that the Hospital Committee be instructed to take steps as they shall deem most advisable to prevent the practice of mesmerism or animal magnetism in future within the hospital," in consequence of which Elliotson resigned his position as physician to the hospital (1838). As a result of his efforts, "Mesmeric Infirmaries" were established in London, Edinburgh, and Dublin, and many surgical operations painlessly performed upon mesmerised patients ("Numerous Cases of Surgical Operations without Pain in the Mesmeric State." By John Elliotson, M.D., F.R.S., London, 1843). When, in 1842, Mr. Ward, a surgeon, amputated a thigh during mesmeric trance, the celebrated physiologist, MARSHALL HALL (1790-1857), suggested that the patient was an impostor, because he had been absolutely quiet during the operation ; if he had not been simulating insensibility, he would have had reflex movements in the other leg. Elliotson's work was taken up in 1843 by **JAMES ESDAILE** (1808-1859), a Medical Officer of the East India Company, who used mesmerism for the production of anæsthesia in surgical operations and was so successful that a small hospital was granted him in Calcutta in 1846, where he performed many major and a multitude of minor surgical operations on mesmerised patients ("Mesmerism in India," 1846, and "The Introduction of Mesmerism as an Anæsthetic and Curative Agent," 1852). Before Elliotson and Esdaile, magnetism for the production of anæsthesia in surgical operations was employed by J. C. A. RÉCAMIER (1774-1852) in 1821 and JULES CLOQUET (1790-1883) in 1829. The latter removed a cancerous breast from a mesmerised patient. Mesmerism as an anæsthetic might certainly have come into general use had it not happened that just as its merits were becoming known Sir JAMES SIMPSON (1811-1870) made his great discovery of chloroform. Orthodox medicine, committed to a denial of the efficacy of psychic healing, welcomed the new anæsthetic with acclamation. The claims of the mesmerists were forgotten or dismissed as ridiculous, Esdaile was described as an honest fool, who was deceived by his patients—a set of hardened and determined impostors—and the physical method of producing insensibility—dear to the scientific mind because it was physical—achieved absolute dominion.,

While Elliotson and Esdaile are forgotten to-day, there was yet another medical man, **JAMES BRAID** (1795-1860), who interested himself in the subject through seeing the demonstrations of La Fontaine. His work was revived some forty years later. He gave the name nervous sleep—neuro-hypnotism—or, for short, hypnotism, to the mesmeric phenomena, and attributed them to suggestion ("Neurypnology," 1843). In 1842, when Braid offered a paper on the subject of his study to the Medical Section of the British Association held that year in Manchester, it was refused ; but in 1880 the British Medical Association invited Professor W. T. PREYER (1841-1897), of the University of Jena in Germany, the translator of Braid's "Neurypnology" (1881), who had become converted to "Braidism," as he called hypnotism, to come over and explain to an English medical audience what Braid, their distinguished countryman, whom the Germans had learned to honour, had achieved. From this time the practice of hypnotism as a means of therapeutic suggestion was tolerated. It was RUDOLF HEIDENHAIN (1834-1897), Professor of Physiology in Breslau University, who popularised hypnotism in Germany ("Der sogenannte thierische Magnetismus," Leipsic, 1880).

The last abusive article in England—of importance—appeared in 1883, when EDMUND GURNEY (1847-1888) and F. W. H. MYERS (1843-1901) published their investigations into hypnotism, when a renowned medical journal wrote: "The medical profession has made up its mind about these hypnotic manifestations long ago, and satisfied itself that they consist of a small nucleus of genuine phenomena, and **a huge mass of wilful deception and vulgar buffoonery.** Medical men have enough to do in dealing with the sad realities of life, and in the pursuit of legitimate science, and have no time to waste on the curious conundrums that may be prepared for them by idlers, poets, and philosophers, or in the detection of fraud."

In 1860, AZAM, of Bordeaux, aided by Velpau, Broca, Verneuil, Cloquin and Follin investigated the facts given by Braid in 1858, and published a work thereon. In 1875, RICHET studied artificial somnambulism.

JEAN MARIE CHARCOT (1825-1893), who had been applying hypnotism to hysterical patients at the Salpêtrière Hospital in Paris, commenced classes for instruction in 1878; but it was not till after HIPPOLYTE BERNHEIM (1840-1919), who had studied with **LIÉBEAULT** at Nancy since 1880 and accepted his views, published his treatise on "Suggestive Therapeutics" (1886), that hypnotism came to be seriously regarded. Liébeault founded the Nancy school of hypnotists in 1860. After 1886, medical men from all quarters went to study under Liébeault and Bernheim at Nancy, and to investigate Charcot's experiments in Paris. The former school held hypnosis to be entirely due to suggestion; while the latter declared it to be an artificial neurosis akin to hysteria. But the theory of suggestion is contradicted by the hypnotisation of animals; and hypnosis is not like hysteria either, for it can be broken off at any time. The suggestion theory was in the end successful and is the one now held. But in my opinion, as I have already said, **hypnotic phenomena are not all due to suggestion.** Many results cannot be explained by it: for example, that persons can be hypnotised without their knowledge. Nor is the suggestion theory compatible with the definite physiological effects upon the muscles, the circulation, the secretions; and that children, too young to understand what is expected of them, and animals of various kinds, can be mesmerised. When we ask the question: "What is the cause of the extraordinary effects of experimental hypnotism?" the answer invariably is: "It is all caused by suggestion." "But how is suggestion to be explained?" "That is also very simple; it is the consequence of 'suggestibility,' which is a natural property of human beings." So the schoolmen believed that they had explained the reason why opium caused sleep by saying that opium had a sleep-producing virtue.

Hypnotism was looked upon with suspicion by medical men and they instructed the laity to look upon its phenomena as fraudulent and dangerous. When later the medical profession took the subject up, the public, previously warned, would have none of it, and only a few outsiders dared to practise it. Most of these have now ceased to produce genuine hypnosis and content themselves with inducing the somnolent state.

ACCREDITED PHENOMENA OF EXPERIMENTAL HYPNOTISM

I shall now describe the phenomena of *experimental* hypnotism. These are highly interesting to the psychologist, and must be studied carefully. Unfortunately the layman, and a good many physicians, are under the false impression that these curious phenomena—seen frequently in stage performances—are produced also in psychotherapy, *i.e.*, in the treatment of patients by suggestion. I must repeat again that **psychotherapy and suggestion treatment consist principally of the application of methods for the re-education of the character of the patient,** and no physician of reputation would attempt to produce other phenomena than those essential to the recovery of health and the mental equilibrium.

It is especially in the somnambulistic state that the astonishing phenomena o suggestion are observed, when suggestibility is heightened to the greatest degre The subject believes everything that his hypnotiser tells him, and does everythin not repugnant to him which the latter commands. Even results over which th will has normally no control, such as sneezing, secretion, reddening and growin pale, alterations of temperature and heart-beat, menstruation, action of the bowel etc., may take place in consequence of the operator's firm assertions during th hypnotic trance, and the resulting conviction on the part of the subject, that th effects will occur.

The subject, though not asleep, yet does not move or think, and can be s impressed through the sensory channels as to enter upon some definite train c ideas or movements. He lacks spontaneity, like a machine that cannot star itself but can be set going by the operator.

Verbal suggestion is not always necessary. One need say nothing, but, fo example, by someone playing some tune, the hypnotised subject will be influence by it, and music will act by way of suggestion. Thus a reel will set him dancin with grace or little elegance, according to his natural capacity. He will assum the attitudes and gestures corresponding to the character of the music. A solem strain will readily cause him to kneel and pray, or to join in the devotiona music; and a war-like march will cause him to march about in a soldierlik manner.

Whatever suggestions may be imparted to his subconscious mind, the subjec accepts them as facts, from which he reasons. His subconscious mind is incapabl of inductive reasoning, therefore he does not trouble himself whether the premis is true or false; that is to say, he proceeds at once to deductive reasoning, and thi as a rule perfectly, as his deductions are logically correct from a false premiss as the are from a true one.

The subconscious mind accepts, without hesitation or doubt, every statement that is made to it, no matter how absurd, incongruous or contrary to the objective experience of the individual. The subconscious mind does not classify a series of known facts and then reason from them up to general principles; but, given a general principle to start with, it will reason deductively from that down to all legitimate inferences, with marvellous cogency and power. The subject takes the text from his operator; but he may amplify and develop it enormously as he acts it out.

Place a man of intelligence and cultivation in the somnambulic state, and give him a premiss, say in the form of a statement of a general principle of philosophy, and no matter what may have been his opinions in his normal condition, he will unhesitatingly, in obedience to the power of suggestion, assume the correctness of the proposition.

False and true suggestions alike are carried into active effect. Thus, for instance, any character suggested to a hypnotised subject in this state will be instantaneously assumed, so far as it is physically possible to do so, and will be personated with marvellous fidelity to the original, just as far as the subject's knowledge of the original extends. If it is suggested to a subject that he is another person, a peasant, a general, or an archbishop, he will readily take up the suggestion, and will speak and act the part with great accuracy. His own personality is for the moment completely obscured, while the suggestion of a fresh personality is readily taken up. If he is told the next second that he is the President of the United States, he will act the part with wonderful fidelity to life. If he is told that he is in the presence of angels, he will be profoundly moved to acts of devotion. If the presence of devils is suggested his terror will be instant, and painful to behold. If a subject is told that he is a dog, he will instantly accept the suggestion and, to the limit of physical possibility, act the part suggested, and for each of these states his

imagination, aided by memory which is continuous for the character, will suggest a suitable system of ideas and of actions.

An experiment frequently performed is to cause a grown-up woman to believe that she is still a child, when it is found that she speaks in a childish voice and even writes like a child, asks for her doll, and cries when she thinks someone is taking her doll away.

It is evident that in hypnotisation the ideo-reflex excitability is increased in the brain, so that any idea received is immediately transformed into an act, without the controlling portion of the brain, the higher centres, being able to prevent the transformation.

The subject may be rendered happy and gay, or sad and dejected, angry or pleased, liberal or stingy, proud or vain, pugnacious or pacific, bold or timid, hopeful or despondent, insolent or respectful. He may be made to sing, shout, laugh, weep, act, dance, shoot, fish, preach, pray, deliver an eloquent oration, or excogitate a profound argument.

The expression during these delusions is also important. In all such experiments one will observe that the gestures and voice, the manner and expression, the whole physiognomical and natural language, are extremely perfect. The attitudes of pride, humility, anger, fear, kindness, pugnacity, devotion or meditation, and all others are, with peculiarities in each case, depending on the idiosyncrasy of the individual, beautiful studies for the artist.

The attitudes and gestures are equal to or surpass the best efforts of the most accomplished actor, although the hypnotised subject may be a person of limited intellectual cultivation, and show no peculiar talent for mimicry in the waking state. Everyone knows how difficult it is to place oneself in a particular position so that the expression, the attitude and the actions should correspond to the idea. To represent such a situation as naturally as possible is the greatest art of the actor, but is very seldom altogether realised on the stage ; but it is still more difficult to change the mood in a moment, and pass from one situation to another in a few seconds. The hypnotised subject, however, does so easily. In personating suggested characters, he is really not " acting a part " in the ordinary sense of the word. It is much more than acting, for the subject believes himself to be the actual personality suggested ; just as the excellence of the real actor is proportionate in each case to his ability to forget his own personality and to identify himself with that of the character which he seeks to portray. The essential conditions of good acting are therefore present in perfection. It follows that the rendition will approach perfection in proportion to the subject's knowledge and intelligent appreciation of the salient characteristics of the suggested personality. Occasionally a suggested character may appear unreal to the subject, and in such a case he may be conscious of " playing a comedy," and have enough recollection when awakened to imagine that he has been shamming all the while. Yet if we hypnotise him again, he is again unable to resist the suggestions made, and performs them so faithfully, that if he were shamming he must long since have found his true function in life upon the stage.

One of the remarkable effects of hypnotism is the recollection of circumstances and the revival of impressions long since past, the images of which had been completely lost to ordinary memory, and which are not recoverable in the ordinary state of the brain. All the sensations which we have ever experienced have left behind them traces so slight as to be intangible and imperceptible under ordinary circumstances ; but hypnotic suggestion, addressing itself to the subconscious mind, and the subconscious mind being the storehouse of memories, they can be recalled at the command of the operator. **The subject can be made to remember in hypnosis everything learned in normal life, even when it has apparently been forgotten.** On the other hand, the subject can be made to believe that he has experienced something that

never really occurred. This happens also in the waking state in some people, especially children with a lively imagination. The police-court reports frequently contain cases of false accusations against people, told with such perfection and with such plausible accuracy of detail, that only a very clever cross-examination can detect any flaws in the evidence.

Many persons not hypnotised yet perform actions, innocent and sometimes criminal, as if in a dream, of which they have no recollection afterwards. This is the case in epilepsy sometimes, and in hystero-epilepsy. By hypnotising such patients we can get at their subconscious state of mind in which they performed these actions, and can induce them to tell us all about the occurrence.

Hypnotised subjects are said to be capable of repeating everything like phonographs. BRAID had an experience which attracted considerable attention at the time. One of his subjects, a young workgirl, who did not know the grammar of her own language and who had never been taught music, though she must have possessed the gift subconsciously, correctly accompanied Jenny Lind in several songs in different languages, and also in a long and difficult chromatic exercise which was specially improvised in order to test her.

The memory may be obliterated. Nothing is easier than to make subjects forget their own name and condition in life. It is one of the suggestions which most promptly succeed, even with quite fresh subjects.

A subject may forget whole periods of his life at the suggestion of the hypnotiser.

Sense delusions are common in hypnotism, either as hallucinations or illusions.

An *illusion* is the false interpretation of an existing external object, as, for instance, when a chair is taken for a lion, a broomstick for a beautiful woman, a noise in the street for orchestral music, or when I ask a subject whether he would like to smoke and he accepts a lead-pencil in place of a cigarette and attempts to light it. That the illusion is real is evident by the fact that the subject will imagine he is drawing smoke from the pencil, which, of course, is not even alight, and will even cough, if smoking is usually irritating to his throat.

A *hallucination* is the perception of an object where there is really nothing ; as, for instance, when I say to a subject, " Sit down in this armchair," where there is really no chair at all, yet the hallucination is so perfect that he does put himself in exactly the same attitude as if he were sitting in a real chair. It seems incredible that a hallucination should be so real that a person can assume an attitude so strained, but it is so.

Suggest to a person that a swarm of bees is buzzing about him ; he will not only see and hear the bees, but he will go through violent antics to beat them off.

Or tell a person that there are " rats " in the room, and the word will waken a train of imagery in the patient, which is immediately projected outward in an expressive display of appropriate gestures of aversion and corresponding movements of avoidance.

The fear depicted on the face of a subject when he believes he is about to be attacked by a tiger is most impressive.

Hallucinations of all the senses and delusions of every conceivable kind can be easily suggested to good subjects. The emotional effects are then often so lively, and the pantomimic display so expressive, that it is hard not to believe in a certain " psychic hyper-excitability " as one of the concomitants of the hypnotic condition.

Hallucinations have been shown by ALFRED BINET (1857-1911) and CHARLES FÉRÉ (1852-) to be doubled by a prism or mirror, magnified by a lens, and in many other ways to behave optically like real objects.

In suggesting a hallucination, say that of a bird, the suggested approach of the object causes contraction of the pupil, and *vice versa*. At the same time there is often convergence of the axis of the eyes, as if a real object were present.

Those who have witnessed public exhibitions of hypnotic performances will

remember that hypnotised subjects will drink water or even ink for wine, and will eat onions for pears. The showman will make them eat a potato for a peach, or drink a cup of vinegar for a glass of champagne. A subject will drink several glasses of wine by suggestion, will become red in the face and then complain of his head. He may be thrown into a state of intoxication by being caused to drink a glass of water under the impression that it is brandy; or he may be restored to sobriety by the administration of brandy, under the guise of an antidote for drunkenness. In these cases the expression of the face induced by the suggested perception corresponds so perfectly to it that a better effect would scarcely be produced if the real article were used. The operator may give his subject simple water to taste, telling him that it is some nauseating and bitter mixture, and he spits it out with grimaces of disgust. If he says that what he is offering is sweet and pleasant, though it is as bitter as wormwood, the subject smacks his lips as if he had tasted something remarkably good. The senses are dominated by the idea suggested, and such a person is very much in the position of an insane person who believes that he tastes poison in his food when he imagines that someone wishes to poison him.

Ammonia will smell like eau-de-Cologne and a piece of cork may be taken by the subject for an onion, and his eyes will fill with tears if he smells it.

Naturally, several organs can be influenced by suggestion at the same time. I tell someone, "Here is a rose"; at once he not only sees, but feels and smells the rose. I pretend to give another subject a dozen oysters; he eats them without it being necessary for me to say a word. The suggestion here affects sight, feeling and taste at the same time. In many cases the muscular sense is influenced in a striking manner by such suggestions. I suggest to a subject that he is to drink an imaginary glass of wine; he lifts the pretended glass to his lips, and leaves a space between hand and mouth as he would if he held a real glass. I am not obliged to define the delusion for each separate sense, the subject does that spontaneously fo himself. The deception, if it is thorough, is clearly reflected in the subject's expression and gestures. No gourmand could wear a more delighted expression over some favourite dish than does a subject over a suggested delicacy.

When the delusion is positive the subject believes he sees what does not exist; when it is negative he fails to recognise the presence of an object really placed before him. I have often made the post-hypnotic suggestion to a subject that on waking he will not see me, although I shall remain in the room, and although he will see everybody else. The subject then can hear and feel me, but fails to see me. When speaking to him I observe his head and eyes turn in my direction, but it is as if I had on a fairy helmet which hides me, he cannot see me. This is a negative hallucination of sight. Similarly, it may be suggested that the subject is deaf to certain words, and not to others.

Negative hallucinations depend upon the co-operation of various factors; firstly, dream-consciousness which creates the tendency to negative sense-delusions; secondly, the subject's belief in everything the experimenter says, which favours those delusions; thirdly, the mental state which results from this, and which may be regarded as analogous to diversion of the attention.

An entire cessation of the functions of any sense organ can be induced in the same way as a negative hallucination. "You can no longer hear, you are deaf!" or "You are blind!"; these words suffice to deprive the subject of the corresponding sense-perceptions. Not only does he cease to recognise any particular object, but the sense organ affected is insusceptible to anything. A command suffices to restore the functions.

It is certain that the blindness and deafness induced in this way are of a mental nature, for the corresponding organ of sense performs its functions, though the impressions do not reach the consciousness. In the same way the sight of one eye can be prevented, though the other can see as usual.

Various **physiological effects** can be produced in the state of hypnosis. Thus *lachrymal* secretion can be excited either by suggesting emotional states or by a sense delusion such as a pungent smell.

I have even seen a subject weep and shed tears on one side of the face, and laugh with the other. I do not think any conscious person has separate control over each side of the face, or at least not perfect control.

The *pulse* can be quickened or retarded, *respiration* slowed or accelerated, or temporarily arrested, and *perspiration* can be produced—all by suggestion. Even the *temperature* can be affected. Thus it has been observed that if a subject is told he is in high fever his pulse will become rapid, his face flushed, and his temperature increased. Or a person is told that he is standing on ice. He feels cold at once. He trembles, his teeth chatter, he wraps himself in his coat. " Goose-skin " can be produced by the suggestion of a cold bath. *Hunger and thirst* can be created, or the *action of the bowels* stimulated or arrested, and other functions increased or retarded.

The mind can be so concentrated upon a physiological process as to stimulate that process to unusual activity, so as to produce curative effects ; and even to superabundant activity, so as to produce pathological effects, or disease. For instance, a blister can be caused on a sound and healthy skin by applying a postage stamp and suggesting that it is a fly-plaster ; or as ERNST JENDRASSIK (1858) and R. v. KRAFFT-EBING (1840-1902) have done to subjects in the hypnotic state, by placing upon the healthy skin a key or a coin with the suggestion that at a given time, say two hours after waking, a blister will appear at the spot where the key or coin had been placed, and of corresponding size and shape. The key or coin is then removed and the patient awakens having no conscious knowledge of the suggestion given ; but at the appointed time the blister appears.

On the other hand, blisters and burns have been annulled by suggestion by DELBOEUF and others.

Mere local redness of the skin is easily produced by suggestion, and can be seen to appear in a few minutes.

The production of reddening and bleeding of the skin in hypnotised subjects, suggested by tracing lines or pressing objects thereupon, throws a new light on the accounts of the stigmata of the cross appearing on the hands, feet, sides and forehead of certain mystics.

Post-hypnotic suggestions are deferred suggestions given to the subjects during hypnosis, to take effect after waking. The patient is hypnotised, and then impressions are made upon him which reappear when he is awake. The deeper the hypnosis the greater the success of post-hypnotic suggestion. When he is recalled to consciousness he has no recollection of having received any instruction, but at the time stated, or when the circumstances arise, he will proceed to do what has been suggested to him.

When subjects are questioned as to their motive for acting on a post-hypnotic suggestion they give different answers ; they either believe that they have so acted of their own accord, and invent plausible and ingenious reasons for their proceedings, or they say they felt impelled to act so. " It came into my head to do it," is a common reply. We can use suggestion here also. When the original suggestion is being made, it may at the same time be suggested to the subject to believe that he has acted of his own free-will.

Something also depends upon the frequency with which the experiment is made, and particularly on the greater or lesser absurdity of the suggested act. If a suggestion is absurd, the subject may struggle against the impulse which he feels rising in him—he knows not why. The event will take place at whatever time we may have suggested to the subject while in the trance, whether in 1, 2, or 24 hours, or 1,000 or 2,000 minutes, or in a month or more remote periods from the day on which a subject has been hypnotised.

There are numerous cases on record in which a subject has been ordered to go to a certain person's house at a certain hour and deliver some message. As the time approaches he is seen to be restless, till he sets out for his destination. He pays no attention to the people he may meet, and, if they purposely arrest him, he forces his way onwards, delivers his message, and can only say that he felt that he had to do so.

The sense of time appears to be an innate mental power, for there have been cases of idiot boys who were able to guess the time correctly, no matter how suddenly the question was put to them.

It would appear that our subconsciousness is marking time very accurately, without our being aware of it, and at the suggested moment an impulse arises which arouses our consciousness. Even when we are not hypnotised, but suggest to ourselves certain acts to take place at a particular time, the event will happen at the time indicated. Many people on going to bed can " will " to awake at a certain hour.

When the mind is made up to perform a certain action at a certain time, the idea is then dismissed from the mind ; but if the subconsciousness has been properly trained, at the time, or reasonably near it, the action will be performed, although neither the thought of the time nor the idea of performing the action may have been in the mind from the moment that the resolution was taken.

Sometimes no definite time is given, but we suggest that at a time marked by a signal a certain event is to take place. The moment the signal occurs the subject, who until then seems in a perfectly normal waking condition, will experience the suggested effect.

In the same manner, one can determine by the signal the hour and minute at which the patient will of his own accord lapse into trance again.

But what is more important still, **one can prevent by post-hypnotic suggestion any other person being able to hypnotise the patient,** and one can even suggest a resisting power against one's own influence. Often when I have cured a person and there has been no likelihood of their requiring my services again I have suggested to them in the last trance, that no one, not even myself, should ever be able to hypnotise them again. In such cases I have tried during the same week whether I could hypnotise them once more, but failed. Whether I should have failed equally after a year or so I am not in a position to say, not having had the opportunity.

Anyhow, this *de-hypnotisation* of a patient is an excellent precaution for susceptible people against *unexpected* hypnosis by designing persons who know their weakness, and that is what most people are afraid of.

The most important of all post-hypnotic suggestions are, of course, those relative to the patient's health. In this way one can make the patient who is melancholic feel happy, the patient who has no appetite feel hungry, or the man who has morbid habits have hallucinations which will deter him from indulging in them after emerging from his trance, without the patient being conscious that any suggestion has been made.

A person suffering from insomnia may be told in the hypnotic state that he will get drowsy at eleven o'clock at night and sleep soundly until eight in the morning, waking up quite fresh in body and mind. Another person addicted to the drink or drug habit may be told that when the temptation arises again, it will be successfully conquered, he fearing the consequences of yielding to it and being convinced he can struggle against the habit, or for other reasons which will arise in his mind and which he will believe are entirely his own without remembering or suspecting their having been suggested to him.

Even dreams can be influenced by post-hypnotic suggestion. I have told patients of a melancholic state of mind the loveliest dreams in the trance suited to their character and ambitions in life, to be dreamed on the succeeding night, and told them

that they would remember them on the following day and feel happy in the enjoyment of the recollection. Thus I could influence their state of mind when no other remedy was successful. The drunkard can be made to dream of his cure and subsequent success in life ; the man with fixed ideas and phobias of the absurdity of his obsessions. Lost memories can be restored by dreams suggested in hypnosis. Such dreams frequently give the patient a firmer conviction than the suggestions alone would make while in hypnosis. Indeed, let me remark here, that success in curing patients by means of hypnosis depends not merely on knowing how to hypnotise, as some people and even professional men seem to believe, but still more on knowing **how to make the right suggestions individually, according to the mind and character, desires and habits of the patient.** A knowledge of human nature is therefore essential.

Sometimes hysteria as well as melancholy is caused by some event of the past life, which the patient cannot forget, or which, even if the remembrance no longer exists in his active consciousness, persists in subconsciousness. Is it not a blessing that in the trance the memory also can be influenced by post-hypnotic suggestion and that a person can be made to forget on waking the painful events of his past life, which have had such a baneful influence on his mind ?

The physiological effects produced in the *hypnotic* state can also be produced in the *post-hypnotic* state.

Hunger and thirst can be excited by post-hypnotic suggestion, which is useful in patients suffering from morbid loss of appetite. Healthy subjects who have just eaten a hearty meal can be made to feel fresh hunger and go through another meal. DELBOEUF, on the other hand, has induced loss of appetite by suggestion to such an extent and for so long a period that the person concerned took no solid food for fourteen days. Further, it is possible, up to a certain point, to satisfy the hunger and thirst of subjects in deep hypnosis by merely suggested food and drink.

One of the most certain effects is the *regulation of bowels.* In chronically constipated subjects I have sometimes suggested that at a fixed time the bowels shall be relieved and such action has occurred invariably. Similarly their action has been arrested by post-hypnotic suggestion.

The occurrence of the *menstrual* period can also be retarded and accelerated by post-hypnotic suggestion. I caused the menses to appear in an anæmic woman on a certain day—though not exactly to the hour suggested. My case may have been coincidence, but FOREL experimented on a number of his female asylum attendants, and most successfully.

The *secretion of milk*, also, has been increased as well as arrested by suggestion. The old mesmerists reported many such cases. J. Grossmann reports a recent case ; also Hassenstein. The latter caused a copious flow of milk in a wet nurse in whom the secretion had ceased to flow. It had ceased, however, owing to the excitement over the child's condition, and was renewed by suggesting away the excitement.

Post-hypnotic suggestion may also be applied for purposes of education. Boys can be made to apply themselves to their studies, to invent, compose, etc., provided the suggestion is in harmony with their innate capacities. I have produced wonderful results in that way.

The personal character may also be influenced for the good by post-hypnotic suggestion. People are often so astonished at the effects of hypnotism when they watch the treatment that they request one sometimes to suggest various improvements in the personal character of the subject, or in his manners to particular relatives or acquaintances. Quarrelsome men and women have been thus rendered amiable in disposition, for their attention being drawn in the hypnotic state to their natural characteristics, they acted up to the suggestion, and exercised greater control afterwards over their tendencies. In others, over-sensitiveness has been reduced to a

normal degree, and obstinacy and other undesirable characteristics have been rectified.

Strong protests have been raised against this method of rendering a person healthy or moral; but if to heal the sick, to give sleep to the weary and heavy-laden, to suggest to the vicious to be "virtuous," to the thief to "steal no more," to the victim of abnormal and fearful perversions to "be free," and to the drunkard to be "sober"; if to suggest this and far more—and with the certainty of its being fulfilled—is opposed to ethics, then we ought also to abolish opium, belladonna, strychnine, and other poisonous drugs from our pharmacopœia. One has to distinguish between (1) therapeutic application of hypnotism, (2) experimental investigations, and (3) the show-effects of popular performances to carry conviction to sceptics. Physicians of repute may be trusted to limit their influence to the production of phenomena which tend towards the recovery of their patients. To perform experiments on them would be as reprehensible as taking advantage of persons while under anæsthesia. Besides, as I have already explained, all suggestion is now done in the somnolent state, when the consciousness of the patient is still entire; and I personally have found that even when a person falls asleep he can be roused immediately, and the injunction given then, when awake, will still be effective. The old methods of hypnotism are now rarely applied by physicians; the entire treatment is based on known psychological principles, and has much more to do with the laws of concentration and mental control than with so-called "suggestion."

CHAPTER XXXVIII

EXTRAORDINARY PHENOMENA

EVIDENCE OF UNEXPLORED FORCES AND CAPACITIES

IN 1779, a few years previous to Galvani's experiments, WALSH and INGELHAUS made a series of important investigations regarding the electrical phenomena present in certain fishes, namely the torpedo fish and electric eel, which have the power of producing shocks in animals similar to those produced by an electric current. These fishes possess complicated electric organs developed out of muscular tissue, which have the power of accumulating electric force in large quantities and communicating it to other animals. When, however, we come to ask the question: What is this nervous energy which travels along the nerves to cause a muscle to contract or an electric organ to discharge itself? science as yet can give no definite answer. Physiologists hold that though it bears definite relations to electricity, it is not electricity itself, since the rate at which its impulse travels is too slow to be thus explained, but that it is a form of ether vibration there can be little doubt. This nerve force was in early days believed to be analogous to magnetism, and people were credited by the old magnetisers with the possession of an aura or atmosphere which emanated from their bodies, and which, like magnetism, possessed polarity, and had the power of attraction and repulsion, and was capable of acting even over space. Hence the force was named by them—animal magnetism. This doctrine, however, was more or less confined to them, and obtained little credence amongst scientific men generally, although there were a few men of scientific eminence who held these views.

In 1820 H. C. OERSTED (1777-1851), of Copenhagen, discovered electro-magnetism. He found that when a galvanic current was passed along a wire near a magnetic needle, the needle was deflected one way or the other in accordance with the direction of the current. The astatic needle and galvanometer owe their invention to this discovery; and later on the evolution of the dynamo, with the production of electro-motive force and electric light, was a further result.

In 1845, twenty-five years after Oersted's great discovery, **KARL von REICHENBACH** (1788-1869), of Vienna, naturalist and technical expert, discoverer of paraffin and creosote, made a series of experiments as to the influence of magnets, etc., on "sensitives," that is, people whose powers of perception are exalted above the normal standard by virtue of a highly-strung and sensitive nervous system, or those in an abnormal state of consciousness through hypnosis; and the results he obtained, although treated with indifference, or even contempt, by his scientific contemporaries, are so striking in the light of recent research and knowledge that I feel tempted to refer to them briefly. Reichenbach found that when strong magnets were presented to those subjects they saw flamelike appearances proceeding from the poles and sides of the magnets; the same phenomenon was observed in the case of crystals, and, moreover, they claimed to see "fiery bundles or light flow from the finger-tips of healthy men," in the same way as from the poles of magnets and crystals.

He found also that the force present in magnets and crystals and human beings could be transferred to other bodies—for instance, water—and could be transmitted even along a wire, so as to be recognised in each case by the sensitive. To this force he gave the name Od or Odyle, and he concluded that the human manifestation of it, namely animal magnetism, was but a new manifestation of the form of energy present in magnets and crystals, and he believed, moreover, that although it is present in magnets it had an existence independent of them. He found, moreover, that his Odic force exhibited polarity, that it was capable of conduction to distances, but that its conduction was much slower than electricity; it was also present in solar radiation, and appeared to exist also in artificial light; bodies could be charged with it either by close proximity or contact, but to a less degree than the one that generated it, and the force, while it lasted, in like manner, exhibited polarity, but was quickly dissipated.

The weak point in the observations of Reichenbach was held to be that they so largely depended on the good faith of his sensitives, a class of people whose testimony is often unreliable, owing to the possibility of hypnotic suggestion causing them to see things subjectively which do not exist in fact, and also because no one in an ordinary state of consciousness has been able to verify the truth of these phenomena at first hand by the use of his senses. On the other hand, the argument for their plausibility gains considerable strength when it is seen how prophetic some of Reichenbach's experiments and conclusions were of what is now being re-affirmed by modern science. A volume of these researches was published by Reichenbach in 1845, and was translated into English by Dr. Gregory in 1850.

It is in recent years that the interest in nerve energy has received a fresh impulse owing to the great and momentous revolution which has taken place in physical science in regard to the new views on the nature of energy and matter. This is in great measure due to the researches of Sir WILLIAM CROOKES (1833-1919) on the properties of radiant energy which were commenced by him in 1872, and also as a result of the brilliant mathematical deductions made by J. CLERK-MAXWELL (1831-1879), who in the sixties gave the first hint of the existence of electro-magnetic waves, and who, working on the same lines, formulated in later years his great electro-magnetic theory of light. The experimental proof of the former was demonstrated in 1888 by his disciple HEINRICH HERTZ (1857-1894), through whose epoch-making experiments the means of communicating over space by means of electric waves has been discovered; and the latter is now generally accepted by men of science. Following on Crookes' researches, we find LINARD in 1894 adding important information to our knowledge of radiant energy, and two years later, in consequence of these observations, Professor RÖNTGEN discovered that the cathode or X-rays given out by a Crookes's tube could, by the aid of photography, produce skiagraphs of the bones of the human body and other substances. Shortly after, about the year 1898, Professor and Madame CURIE, following up the work of the great French physicist, HENRI BECQUEREL (1852-1908), on radio-activity, discovered radium and polonium respectively.

It would be out of place, besides taking up too much space, even to outline what has been done in the study of radio-activity, and the tremendous results which have arisen therefrom, or to mention the long list of great names which have been associated in this grand work. The great point which bears on our subject of nervous energy is that out of this mass of accumulated knowledge, a great scientific generalisation has arisen which stands hardly second to evolution itself in importance, and this is the theory of a universal all-pervading ether, which permeates all space, whether terrestrial or celestial, interstellar or intermolecular. This ether is regarded as an attenuated form of matter, which is neither solid, liquid, nor gaseous, but which Sir William Crookes regards as a fourth condition of it, the ultimate particles of which are called ions or electrons; and it is considered that all

energy, such as light, heat, electricity, magnetism, etc., is due to the vibrations of these particles : even the molecules of matter itself are now believed to be built up primarily of these etheric units.

Considering these discoveries—X-rays, wireless telegraphy, radio-activity, etc. —it is not to be wondered at that when Prof. BLONDLOT, of Nancy, announced in 1903 the discovery of certain new radiations, called by him **N-rays** (in honour of Nancy), which were given out by certain substances, and when Prof. CHARPENTIER proved that these were given out in large quantities during nervous activity, that the results of their researches were received with respect and interest.

N-rays are emitted by many different substances, for instance, wood, glass, wool and caoutchouc, when forcibly compressed or twisted. Tempered steel and hammered metals are permanent and spontaneous storers of these rays, but non-tempered steel is inactive. Solar radiations contain N-rays, and stones, quartz, Iceland spar, and fluor spar, when exposed to sunlight, become charged with them. These radiations are capable of reflection, refraction and polarisation. These N-radiations are ether vibrations of long wave-length and are near to electro-magnetic vibrations in point of frequency. They are given off by an incandescent gas flame, and can be separated from heat and light rays by filtration through aluminium-foil, which allows their passage through it whilst intercepting the rays of light and heat. Their presence can be demonstrated because they have the power of increasing the phosphorescence of a platino-cyanide of barium screen, and by causing a small, faintly luminous bluish gas-flame to be rendered whiteish in colour and more luminous when these rays are focussed on it by means of a quartz lens.

The supreme interest of **N-rays,** however, is that **they are given off largely by nerves and nerve-centres,** and Prof. CHARPENTIER demonstrated that their emission was greatly increased during functional activity, such as speaking or putting a muscle into action. Even the act of attention and mental effort was found to increase their activity, the evidence of which was shown by the increased phosphorescence of the platino-cyanide of barium screen.

Blondlot has observed that these rays will act on a photographic plate. He found that if a platino-cyanide of barium screen, which has been exposed to the influence of N-rays, and one that had not been so exposed, were photographed, the former produced the darker print of the two. This, taken with the facts that N-rays increase the luminosity of a feeble gas-flame, and increase the phosphorescence of phosphorescent bodies such as platino-cyanide of barium, etc., suggests that these radiations must possess some intrinsic luminosity, although too faint to be seen by ordinary vision.

Another interesting observation was made in 1905 by Prof. BECQUEREL regarding these rays, namely, that animals put under the influence of chloroform cease to emit **N**-rays, but as soon as the influence of the anæsthetic passes off the emission of the radiations recurs. Moreover, metals, crystals, and other substances which emit N-rays behave in like manner under certain influences.

More recently Dr. PAUL JOIRE (" The Annals of Psychical Science," 1906) has shown that this nervous force is capable of not only being detected, but even measured. He has proved, moreover, that it can be exteriorised in various other bodies. This he demonstrated by an instrument of his own invention—the sthenometer.

The sthenometer consists essentially of a horizontal circular dial, marked out in 360 degrees, in the centre of which, balanced by a pivot on a glass support, is a light needle or pointer, most frequently made of straw. One arm of this pointer is much shorter than the other, and is weighted by a counterpoise to keep it in a horizontal position. The whole is covered with a glass shade. All possible sources of error having been eliminated, such as the action of heat, light, electricity, and sound, by

special tests, it was found that, when the extended fingers of one's hand are brought near the side of the shade without touching it, at right angles to the pointer, after a few seconds, in the majority of cases, a decided movement of the pointer takes place, it being attracted towards the hand. This movement extends over fifteen, twenty, and sometimes up to forty and fifty degrees.

Dr. Joire observed also that not only do the extended fingers produce movements of the sthenometer needle, but also that certain substances which have been held in the hand produce movements, which, previous to being handled, caused no movement at all, thus proving the exteriorisation of this nerve energy. The amount of movement varies with the nature of the substance; some materials produce no movement at all. In all cases it was found that the movement was not so powerful as with the hand which previously handled them. The objects which have been found incapable of storing this force are tinfoil, iron, cotton, and those capable of storing it in different proportions are wood, water, linen, cardboard.

By this brief summary of Blondlot's, Charpentier's and Joire's researches it will be seen how remarkably they are in accordance with many of Reichenbach's observations. Whether the N radiations of Blondlot and the nerve force of Joire coincide with Reichenbach's odic force, or are only part of the radiations studied under that name, is not yet ascertained. At first sight the alleged observation, if it is a fact, that Od presents luminosity would appear to contradict its being simply N radiation, but, as before suggested, it would appear that these radiations may be faintly luminous, but too slightly so for ordinary perception. If, however, we go down the scale of animal life we shall find examples of luminous phenomena apparently of nervous origin. For instance, amongst the beetles, we find two sub-orders containing insects which have the power of emitting light—the glow-worm and the fire-fly. Other examples of luminous phenomena in connection with nervous tissues are to be observed in the light which proceeds from the eyes of some animals and insects, especially when seen in the darkness. In the case of some moths, the light emitted is distinctly violet, cats and dogs give out green, whereas the light from the human eye is orange or red. Certain magnetic phenomena are also attended with luminosity, such as the glow in Crookes's tube in the production of X-rays, and the Aurora Borealis.

Dr. HENRY A. FOTHERBY recently called attention to the analogy of nerve force to magnetic force. He points out, among other facts, that the energy of sound and light is seen to be capable of conversion into nerve energy through the mechanism of special receiving organs, the ear and the eye respectively; just as the energy of sound and light has physically been converted through the mechanism of the telephone and telectroscope into electricity and back again into sound and light. He refers to Joire's sthenometer as proof of the nervous energy having the power of attraction, as in the case of magnetism; and to Blondlot's experiment with N-rays having demonstrated radiations from nervous tissues.

Reichenbach encountered scepticism and even open hostility from the greater number of the representatives of official science when he published the results of his experiments. He had already acquired a certain notoriety by his works on chemistry and especially by his discovery of paraffin and creosote, but he did not belong to the staff of any University.

E. DUBOIS-REYMOND (1818-1896) refused to examine Reichenbach's experiments in detail " because it would at least be impossible for him not to be guilty of using unparliamentary language in doing so." This fear did not prevent him from adding that Reichenbach's work " is one of the most deplorable aberrations that has for a long time affected a human brain; they are fables which should be thrown into the fire."

I, personally, can certainly confirm Reichenbach's observation that **normal,**

healthy persons, in the hypnotic state, are sensitive to the influence of a magnet, and that the ends of the magnet appear to them luminous in a perfectly dark room. The light is described by them as very faint and easily overpowered by the faintest glimmer of ordinary light; and I can also confirm the statement that the human body possesses the same influence, and produces the same effects on sensitive subjects as magnets do, faint rays appearing to issue from the tips of the operator's fingers. Absolute darkness is essential, and some persons require to remain for some time in the darkness before the experiment is commenced. Light from a candle or entering from a chink or cranny may spoil the experiment. I may mention also that I have performed the experiments, which are of a rather unusual kind, repeatedly before small and large audiences of learned and scientifically trained men, and that every possible precaution has been taken to exclude "suggestion." The persons chosen were normal persons who volunteered for the experiment, and not nervous or weak-minded subjects.

Taking a normal subject in the hypnotic state and blindfolding him, one of the first observations that can be made refers to the probable existence of a **human aura,** for by holding one or more fingers near any part of the subject's body or head, without coming in actual contact, that part will be moved in the direction in which the finger is slowly drawn. An ordinary horse-shoe magnet, held similarly, produces a like result, and I have found persons who, unaware of such an instrument being in the room, complained of unpleasant sensations when the magnet was held near the back of their head, questioning me what I was doing and imploring me to desist.

CHARCOT believed in the power of the magnet, BERNHEIM did not. BINET and FÉRÉ claimed that a magnet can effect a transfer of anæsthesia from one side of the body to the other. BORIS SIDIS ("Psychology of Suggestion," 1910) also tried the effects of magnets. Again he made previously the verbal suggestion: "I shall change the direction of the magnet, and the transfer will take place from the arm to the leg." Accordingly, "at the end of a minute the arm fell and the leg was raised." I have already explained that verbal suggestion is stronger than any physical agent. Therefore, by telling the patient what is going to happen, the whole experiment becomes worthless. The subject should never be allowed to know, in the hypnotic state or after, what is expected of him. When he is told in the hypnotic state, the suggested result takes place immediately; when he is told subsequently in the normal waking state, and we repeat the experiment, the subject is likely to remember the information, and he no longer acts automatically or by inspiration, but starts guessing what is required of him, to please the operator or the audience.

MILNE BRAMWELL says on this point: "The enigmatic reports of the effects of magnets and metals, even if they be due, as many contend, to unintentional suggestion on the operator's part, certainly involve hyperæsthetic perception, for the operator seeks as well as possible to conceal the moment when the magnet is brought into play, and yet the subject not only finds it out at once in a way difficult to understand, but may develop effects which (in the first instance certainly) the operator did not expect to find."

We know our friends not only by their visible forms and features; we know them also by the magic atmosphere which surrounds them. At least, some of us do; perhaps they are gifted with a special sensibility of that kind. We have also a feeling that a friendly person is in the house or room, though we cannot see him. Again, two perfect strangers meet and they are drawn to one another before they speak, as if there was an affinity between them; two others meet, and they repel each other.

The experiments of A. BUÉ and LIÉBEAULT have shown that a living being can, merely by his presence, exercise a salutary influence on another living being,

quite independently of suggestion. And is not that the experience of everyone who has ever felt sorrow or been ill ? The child who has just fallen down and is weeping and screaming stops suddenly if his mother, softly rubbing the bruised spot, tells him that it is nothing. Who will deny that, when he has been suffering or troubled, the soft pressure of a beloved hand upon his forehead has suddenly comforted him ? Bué restored the vitality of diseased organs by placing his hands on them or making pressure over them. If the " King's touch " had not had a salutary influence it would not have persisted for so long. How could the thought of healing heal, if the brain, under the influence of this idea, did not constantly send into the diseased organs some currents which restore or regularise the functions ?

Magnets do act on the human body. When passes are made with them the same sensations are experienced as when the operator uses his hands. Here it may be said the influence of the hand is combined with that of the magnet ; but by using the magnet without the hand of the operator, or in the hand of a person whose hand, by itself, has no perceptible effect, it is ascertained that the magnet does exert an influence identical with that exerted by the human hand.

I have seen experiments made in a physiological laboratory to disprove the supposed influence of magnets. A subject was told that a powerful magnet was at work behind his head and tracings were recorded by the proper instruments of his pulse and respiration. Then the subject was told that the magnet had been removed, when actually one was put on, and again tracings were recorded of the pulse and respiration. These tracings were thought to be a proof that the magnet had no power whatsoever, but from what I witnessed I was not convinced, except of one thing, that " suggestion " is stronger than any magnetic force.

I cannot agree with Tamburini's view, that magnetic force has no influence, that " it is only the temperature of the metal which has effect." A. TAMBURINI (1848-1919) found that when a magnet is brought close to the pit of the stomach it influences respiratory movements in hypnosis. Later on, he found that other metallic bodies produced the same effect ; the strength of the effect, however, depended on the size of the piece of metal.

ELLIOTSON, too, believed in the mesmeric powers of certain metals, but Wakley, the editor of the *Lancet*, performed test-experiments (see previous chapter), and, operating with a non-mesmerising metal, made the subject believe he was using a mesmerising one, whereupon she fell asleep ; from this he concluded that all the subjects were impostors ; whereas all Wakley proved was that " suggestion " is able to overcome any of these mysterious forces, which are admitted, by those who believe in their existence, to be very feeble in power.

There is no doubt in my mind that a magnet gives off some force which can be felt by a hypnotised subject, and that our own body, particularly at the fingers' ends, exerts some similar influence. I became convinced of this by placing a hypnotised subject in a completely darkened room, then letting him open his eyes and describe what he saw. I held a magnet suspended in my hand at the poles of which he perceived a luminous appearance, and when holding out my fingers he described similar luminous emanations proceeding from my finger-tips.

I have found that ordinary magnetic discs, which are used for hypnotising people, can be made luminous in the dark, by rubbing them between the fingers. The ordinary bronze coin has a similar though not quite such a strong effect.

The light which the subject declares to emanate from them is sometimes sufficiently strong to illuminate surrounding objects, which the subject will describe.

The one essential condition is that there must be absolute darkness.

The human aura appears to extend from the body for a distance, some say a yard, and gradually fades away. And the aura of each person is seen to be coloured according to the vibrations belonging to his prevailing mental states or character.

It is not unlikely that the human organism is a radio-active body, for if our experiments do not deceive us, the body emits rays which can be seen and felt by sensitive persons. That they can be seen I have already shown. The following is an experiment which I have often repeated which would prove that they can also be felt. A person previously hypnotised and now awake and blindfolded is made to distinguish my hand from a dozen others, *when held above his or hers at a distance of six inches or less for a few seconds.* This is done with great success, and if you give the different persons numbers, the subject will after a time even recognise when the hand of No. 5 or 7 or any other comes round again. This experiment would point to different *emanations* from different people and a discriminative sensibility for them in certain subjects in the hypnotic state. Possibly the sensations may be due entirely to hypersensitiveness to the temperature of the different hands, and this is one of the explanations offered by some of the critics ; even so the performance would be remarkable ; but I cannot think that there is sufficient difference in the temperature of the various hands to be perceived even by the most sensitive subject. There is something to be said for those who assume a magnetic or an electrical force or some still unknown nerve force or vital energy to be at the root of these phenomena.

Electricity is known as a great force in physical nature ; and it is harnessed and made to perform many services to mankind. Like all the great forces of nature, it is invisible, except through its effects, and it defies analysis. It will never be known to man except as one of the great correlated forces. Why should it be thought impossible that a nerve force can emanate under certain conditions from the operator and can control his subject ?

BRAID observed that hypnotised subjects recognise things at a certain distance from the skin, and this simply by the increase and decrease of temperature. They walk about the room with bandaged eyes or in absolute darkness without striking against anything, because they recognise objects by the resistance of the air and by the alteration of temperature. POIRAULT and also DRZEWIECKI found the same.

EDMUND GURNEY (1847-1888) maintained that there must be a special effluence or emanation to account for the fact that a peculiarly susceptible subject could discriminate the passes made by his magnetiser over an arm or finger, though carefully blindfolded and screened off. The effect produced sometimes amounted to complete local anæsthesia, whilst passes of other hypnotists produced no effect.

Prof. OBERSTEINER, of Vienna, supposes that there may possibly be a special magnetic sense, which may come into activity with many people during hypnosis, and which is, perhaps, localised in some terminal organs whose functions are still unknown.

Moll mentions BABINSKI'S and LUYS'S experiments. "If a hypnotised subject and a sick person are set back to back, a magnet put between them will cause the sick person's symptoms to pass over to the hypnotised subject. Hysterical contractures and numbness have been thus transferred, as also the *symptoms* of organic disease—*e.g.*, multiple sclerosis. The transference is said to take place even when the hypnotic has no notion what the sick person's symptoms are—*i.e.*, when suggestion is excluded. Luys went even farther. When he placed a magnet first on a sick person's head and then on a hypnotic's, the morbid symptoms of the first person were supposed to appear in the hypnotised person." Moll's explanation is :

"In these experiments of Babinski and Luys we have an obvious combination of the phenomena of mineral and animal magnetism. It is a significant fact that such assumptions as these have hardly ever been made in recent times by men who must be taken seriously. We are, therefore, justified in now assuming that the results obtained by Babinski and Luys in those experiments were due to suggestion—*i.e.*,

that there was self-deception on the part of the experimenters, who at the time were not so well acquainted with suggestion as a source of error as we are to-day. Of course, all this does not prove that it is *impossible* for the magnet to influence human beings."

FÉRÉ ("Mémoires de la Société de Biologie," 1888) was the first to discover the effect of the emotions on the galvanometer. TARCHANOFF, VERAGUTH, C. J. JUNG, of Zürich, and F. PETERSON, of Columbia University, made further observations and claimed to be able to **measure the emotions.** They showed that if the body of an individual is introduced into the circuit of a mirror-galvanometer through which a weak current is passing, and the resistance being so arranged by means of a rheostat as to enable them to bring the needle to zero on the scale, psychical conditions will lead to a deflection of the needle of the galvanometer. The inference is that the psychical change produces some physical change by which the current passes less readily or more readily through the body. If the individual is spoken to or read to, indifferent words have no effect on the galvanometer, but as soon as words are uttered that evoke an emotional tone, an effect is produced on the galvanometer. Every stimulus accompanied by an emotion caused in normal people a deviation in the galvanometer, recorded upon a kymograph as a curve, the amount of such deviation—or the height of the curve—being in direct proportion to the liveliness and actuality of the emotion aroused. The stimuli were of the most varied kind—for example, the threat of a needle, the sudden fall of a weight with a loud noise or the threat of it, arithmetical calculation, sudden call by name, and so on—and the resulting curves were found in normal people to vary directly in amplitude according to their unemotional and phlegmatic or excitable temperament. Successive stimuli delayed and diminished the response.

Before passing on to the next phenomenon, I would here refer to another of Reichenbach's observations. It is this: Since all chemical action is attended with the emission of odylic light as well as odylic influence, the changes which take place in dead bodies by decay, which are chemical, are sources of odylic light, just as are the changes in the living body, respiration, digestion, etc. Hence sensitive persons see luminous appearances over churchyard graves, especially recent graves, in the dark of the night. There will be found in the work of Reichenbach several most interesting and instructive cases of this fact, and thus we find that science, with her torch, dissipates the shades of superstition. Corpse-lights exist, but they are not supernatural; neither are those who habitually see them "uncanny." The lights are perfectly natural and harmless; and the seers are only sensitive persons.

Another experiment is for a member of the audience to take a packet of blank ivory cards or note-paper, or envelopes, fresh from the stationer's, to select one of these and show it to the hypnotised subject. The card or paper or envelope is then secretly marked and shuffled in amongst the others, or else without any mark the relative position is remembered by the person in charge of the pack, which is returned to the subject, who as a rule without hesitation picks out the right card or other object from the number handed to him, although no difference is perceptible to the most skilful observer watching the performance. This experiment shows the **quickening of the sense of sight** in the subconscious state.

Others have made similar experiments, usually by suggesting photographs to appear on the back of the cards, by which illusion the subject invariably recognises the card. This is no less wonderful, but Moll has an adverse explanation for it, which I cannot pass over. He says: "I will take this opportunity of quoting an experiment which is often repeated and is wrongly considered as a proof of increased keenness of the senses. Let us take a pack of cards, which naturally must have backs of the same pattern, so that to all appearance one cannot be distinguished from the other. Let us choose a card—the ace of hearts, for example—hold it with its back to the subject and arouse by suggestion the idea of a particular photograph

on it—his own, let us say. Let us shuffle the cards, including, of course, that with the supposed photograph on it, and request the hypnotic to find the photograph, without having allowed him to see the face of the cards. He will often find the right one, although the backs are all alike. The experiment can be repeated with visiting-cards, or with sheets of paper, if the selected one is marked, unknown to the hypnotic. This experiment makes a greater impression on the inexperienced than it is entitled to, for most people are able to repeat the experiment without hypnosis, and hyperæsthesia is not generally a condition for its success. If the back of these cards and papers are carefully examined, differences which may easily be discerned will be discovered. The experiment has no bearing on the question of simulation. Naturally, I do not contend that a hypnotic cannot find a paper in such a case better than a waking man. I only wish to point out that although this experiment is often used to demonstrate the presence of hyperæsthesia, the latter is not generally necessary for its success. I have seen men of science show astonishment when a hypnotic distinguished apparently identical sheets of paper. They did not understand that there were essential differences in the sheets, which suffice for distinguishing them even without hypnosis. The experiment is to be explained thus: The minute but recognisable difference (*points de repère*) presented to the hypnotic at the moment when the idea of the photograph was suggested to him recall the suggested image directly he sees them again. The points are so closely associated with the image that they readily call it up. Binet and Féré have rightly pointed out that the image only occurs when the *points de repère* are recalled to the memory; they must first be seen. Consequently, if the paper is held at a distance from the subject's eyes, the image will not be recognised, for the *points de repère* are not visible."

I absolutely deny that a normal person can distinguish a blank card out of a pack of identical cards owing to any defect or any peculiarity in the manufacture, if the same conditions are followed that I have made obligatory in my experiments. Only one card out of a pack is shown to the subject, which is shuffled by some stranger, who must remember whether it is the fifth or fifteenth or any other card, but who need not remain in the room, so as to avoid any suspicion of thought-transference. Nor, of course, should anyone else know, least of all the operator. The subject on receiving the pack will take up one card after another, and as soon as arriving at the right one will stop without looking at the rest of the pack, and hand that particular card over. The subject can often tell when he has received the card upside down.

BRÉMAUD thinks that the increased power of vision in hypnosis is to be ascribed to an increase of attention. Attention is certainly increased, but that is not the entire explanation.

D'ABUNDO produced enlargement of the field of vision by suggestion.

I have frequently demonstrated visual accentuation in another manner. A subject in the hypnotic state after a time may get fatigued and express a wish for a glass of water. On a table close by there are a dozen empty glasses, all exactly alike. I hand to the subject one of these empty glasses and he drinks from it as if it really contained water. When he puts it down all the glasses are changed in position by some member of the audience, so that no person by the mere look of the glasses could tell which is the one that has been used. After some little time the subject himself may want to drink again, or else it may be suggested to him to have another drink. He will glance over the glasses and, to the great astonishment of the audience, take up the right one and empty it of its supposed contents.

BERGSON has described one of the most remarkable cases of increased power of vision. This particular case has been cited as a proof of supersensual thought-transference, but Bergson ascribes the result to hyperæsthesia of the eye. In this case a subject who seemed to be reading through the back of a book held and looked

at by the operator was really proved to be reading the image of the page reflected on the latter's cornea. The same subject was able to discriminate with the naked eye details in a microscopic preparation, to see and draw the cells in a microscopical section, which were only 0·06 millimetres in diameter. SAUVAIRE, after some not quite irreproachable experiments, supposed the existence of such a hyperæsthesia of sight, that a hypnotic subject recognised non-transparent playing-cards by the rays of light passing through them. A case of TAGNET'S, in which an ordinary piece of cardboard was used as a mirror, is said to have shown quite as strong a hyperæsthesia. All objects which were held so that the reflected rays from the card fell on the subject's eye were clearly recognised.

If my subjects could experience sensations beyond the normal, we cannot refuse to believe the abnormal vision of somnambulists and clairvoyants.

The subject can be made to **hear with increased acuteness,** and that to an extent apparently marvellous. The ticking of a watch heard at three feet distance in the waking state becomes audible at thirty-five feet in some hypnotics.

That the sense of **smell** in the hypnotic state is also more acute is equally easy of proof. A card, paper, envelope, or handkerchief is selected from a number, all alike, and the subject is requested to smell it. The object chosen is then put among the rest and the whole packet handed back, when the subject will smell each of them until he gets to the right one, which he gives up, frequently without testing the remainder, so sure is he of his selection.

An experiment in this connection, which I have arranged on several occasions, is the following. The subject is requested to smell a handkerchief, which, of course, must have no scent whatever, and to hand it to some member of the audience. To avoid any possibility of mind-reading the operator takes the subject out of the room while someone hides the handkerchief in some easily accessible place. The subject is led back and told to find the handkerchief. He walks round the room and will soon stop at a place where he makes a search and discovers the article in question.

I have never tested the increased sense of smell beyond the distance of an ordinary room, but BRAID recorded a case in which the scent of a rose was traced through the air at a distance of forty-five feet.

MOLL relates similar experiments. A visiting-card was torn into pieces, which pieces were professedly found purely by the sense of smell; pieces belonging to another card were rejected. The subject gave gloves, keys, and pieces of money to the persons to whom they belonged, guided only by smell. Hyperæsthesia of smell has often been noted in other cases. CARPENTER states that a hypnotic found the owner of a particular glove among sixty other persons. SAUVAIRE relates another such case, in which a hypnotic, after smelling the hands of eight persons, gave to each his own handkerchief, although every effort was made to lead him astray. BRAID and the older mesmerists relate many such phenomena. Braid, like Moll, describes a case in which the subject on each occasion found the owner of some gloves among a number of other people; when his nose was stopped up the experiment failed. This delicacy of the different organs of sense, particularly of the sense of smell, is well known to be normal in many animals; in dogs, for example, who recognise their masters by scent. Hypnotic experiments teach us that this keenness of scent can be attained by human beings in some circumstances.

On the skin two points can be discriminated at less than the normal distance The sense of **touch** is so delicate that, according to DELBOEUF, a subject after simply poising on her finger-tips a blank card drawn from a pack of similar ones can pick it out from the pack again by its "weight."

That the sense of touch is also quickened in the subconscious state can be tested in the following manner. Six objects—I generally choose glasses—are put on a table. The subject looks away or may be blindfolded. Someone selects one o

the glasses which the operator is to touch. The subject is then requested to find the " magnetised " glass, which he does without hesitation.

Frequently I do not even touch the glass, but hold two extended fingers over it. It would appear that in doing this the temperature of the air contained in the glass is slightly raised, sufficiently at least to be recognised by the subject.

I have made movements with a finger at a distance of three to six feet, as if tickling the nose of the subject—who is blindfolded—and produced sneezing; and similar movements elsewhere to the bare skin excited irritation and consequent scratching by the subject. If this hypersensibility does exist, we cannot deny it to other persons—for example, the **water-diviners.** Because a process or event is inexplicable in the light of our present knowledge, this is no reason to deny its existence.

Both the sense of **temperature** and the sense of **taste** can be tested by pouring water into all the glasses and holding two fingers over one. The subject will taste each till he gets to the " magnetised " one, which he hands to the operator. MESMER spoke of mesmerised water, but this idea was scouted and rejected as absurd. But everyone who has studied mesmerism, and tried the experiments, knows that water may be so charged with some force that a person in the mesmeric sleep, without the slightest knowledge that the experiment is made or intended, instantly and infallibly distinguishes such water from that not mesmerised. It is generally described as having a peculiar taste, not easily defined, but different from ordinary water.

MOLL says: " That a magnetised person may at times discern ' magnetised ' water is correct. It has, however, nothing on earth to do with magnetism. In the first place, it is often impossible to prevent a slight rise in the temperature of water that has just been magnetised. Secondly, it is highly probable that in the act of magnetising, which is generally accompanied with the gesture of flourishing something in the direction of the water, chemical substances may be introduced into the latter, and may bring about an alteration in its taste. But chemical dissociations have nothing in common with magnetism, which is supposed to represent a physical force. This intentional confusion between chemical agencies and the magnetic force is a good proof of the want of clearness prevailing on the subject amongst most mesmerists."

Why should Moll assume there is a " gesture of flourishing something in the direction of the water " or the still more abominable insinuation that " chemical substances may be introduced " surreptitiously into the water ? These are genuine scientific experiments, not done for profit, but from the mere desire for knowledge, and surely no scientific man is either such a " fool " as to make flourishes or signs to spoil his own experiment nor such an impostor as to wilfully deceive his audience. Scientific men may differ as to their explanation of such phenomena, but they should not bring accusations against one another without some shade of evidence.

The experiments upon hysterical patients with different **medicines in sealed tubes** performed by BOURRU, BUROT and LUYS, producing the effects of the drugs they contained—sleepiness in the case of opium, drunkenness in the case of alcohol—are said to be due probably to suggestion. Not having tried the experiment, I can offer no opinion.

Not merely the senses, but **all the mental qualities** of a person in the subconscious state, **are highly accentuated** in the state of hypnosis. In some manner, which we are still unable to explain, we can, by touching different regions of the head, standing behind a subject (previously hypnotised, but now awake), and without any " willing " or suggestion, excite expression of different thoughts and emotions, and various dispositions.

By touching symmetrical points on the subject's cranium, various manifestations

are elicited, both in word and gesture, such as devotion, anger, benevolence, meanness, kleptomania, repentance, conceit, vanity, anxiety, hunger, etc., as well as combinations of these states when two or more centres are touched at the same time.

Such an experiment naturally suggests collusion. To prove that there is no previous arrangement between the operator and subject, the latter should be perfectly ignorant of what is expected, or a new subject should be chosen. A subject who has been operated on before is occasionally too anxious to excel and guesses at what he is to say or do. Moreover, it is not at all necessary that the operator should touch the particular centres; he may let any stranger do so. When the expression is not spontaneous the subject should be asked: "What are you thinking of? What do you see? What do you feel?"

I should also state that I have never produced any effect by mere "willing," or even thinking of the expected manifestation. Frequently it has happened that I have been on a different centre than I intended to touch, and thus got another manifestation than I had promised to produce.

I have excited the same centres by applying a feeble galvanic current and found that the right side alone will not correspond; the left will do so, but the best results are produced by acting symmetrically on both hemispheres of the brain.

It is argued that mere pressure cannot possibly produce such results even on a highly sensitive brain, for the skull is intervening. Quite so, but it must not be forgotten that the skull is not inanimate matter, but a living substance permeated by nerves and bloodvessels. Mere argument will not upset the fact. Let physicians who practise hypnotism experiment as I have done, without preconceived notions as to what is or is not possible. Thus by touching one particular region of the head the patient will be found to assume the attitude of devotion and to say his prayers. The moment the finger is removed, he will leave off abruptly, sometimes at a syllable, breaking the word. When the finger is put down again the prayer will be continued at the same syllable where he left off. Touching another region, the patient can be made to steal, but the moment the finger is removed to a region which I might describe as the moral region of the brain, the stolen object is returned with expressions of remorse.

The expression of the emotions thus produced is simply magnificent, and I have a collection of photographs reproducing them. Thus by touching one part of the head the subject will exhibit a beautiful picture of devotion. He kneels and prays, with a fervour and intensity of expression which it would be difficult to surpass. Humility is intensely predominant in his gesture. When another part is touched, he exhibits pride and hauteur to a most ludicrous degree. In another part the expression changes to compassion, while in yet another the most appalling mimicry of fear and misery is produced.

Many of the old mesmerists and hypnotists, such as GREGORY, ELLIOTSON, BRAID, etc., about whose honesty there can be no question, have obtained the same results, but the experiment is criticised severely by modern investigators who have never attempted to repeat it. There is only one hypnotist, Dr. PITRES, who has made a similar investigation and recorded certain *zones idéogènes*. Braid's acknowledgment should certainly be accepted, since he was not a supporter of that school which believed in a multiplicity of centres in the brain.

SILVA, BINET, FÉRÉ, and HEIDENHAIN claimed that they can move single limbs of the hypnotised person by stimulating the parts of the head which correspond to the motor centres of the limbs concerned. CHALLENDER even proposed to study the physiology of the brain in this way. On the other hand, BORIS SIDIS, the well-known American psychologist, denies the possibility of exciting mental zones. He tells the patient: "Now I am going to touch that part of the cranium which corresponds to the movement of the left arm, and this arm will go into convulsions." He then touches the part, and immediately the left arm

is convulsed (*op. cit.*, p. 83). I can only repeat that verbal suggestion is stronger than any physical influence.

No one who has ever seen these beautiful manifestations can suppose that the state of the subject is a mere reflection of the operator's mind. For while the latter is tranquil, the former may be heaving with emotion; on the other hand, accidental emotions in the operator are not communicated to the subject, who may be acting some passion or feeling to the life, while the operator is convulsed with laughter, and yet he is not thereby affected at all.

I have never seen reason to believe that I have heightened the effect of my processes by exerting the strongest will, or lessened them by thinking intentionally of other things. So far from willing, I had at first no idea of what would be the effect of my processes.

Again I would remark that I have taken all precautions to avoid the possibility of deception.

Firstly, the subject is absolutely unacquainted with what is expected of him, and ignorant of any brain-theory. Yet he will, if a good medium, respond to the touch instantly wherever it may be made.

Secondly, the same results are produced, and have been produced, by a stranger equally ignorant as the subject, being put "*en rapport*" with him while I was talking to somebody in the room. Yet here also the manifestation has often happened as well as before.

Again, it often happens that when an operator knows what to expect and intends to touch a particular part of the head, but, turning to speak to someone, touches a wrong centre, with the idea of the first in his mind, or when his hand accidentally slips, a wrong result is produced.

I know that I shall be abused and ridiculed in placing this last experiment before serious investigators, notwithstanding all the precautions I have used. It will be quoted to show my "credulity." All I can say is that I have proceeded honestly and stated honestly what I have observed. Who does not want to accept my word need not do so, but I am bound to record here this observation, as well as the others, in the full belief that it will be proved and acknowledged some time or other.

Prof. BERNHEIM, the originator of the "suggestion" theory, too, never succeeded in thought-transmission. He says: "I have tried to produce phenomena of thought-transmission in hundreds of cases, but without success. I have found nothing definite. If thought-transmission exists, it is a phenomenon of another order, which has still to be studied. It has nothing in common with the phenomenon of suggestion."

MOLL, another great expert, accepts the possibility of thought-transmission, but attributes it to deception. He thinks that the "hypnotic has a much greater tendency to pay attention to the smallest sign made by the experimenter than a person has who is awake," and that "it is just in this that one of the chief sources of error lies, because what in reality depends on the influence produced by such insignificant signs is very often taken to be the result of telepathic influence." To Moll, what cannot be explained by the theory of suggestion must be the result of deception or fraud. He concludes with the assurance: "I have never observed anything of an occult nature occur during my own experiments, provided the necessary precautions were taken." Quite so, but thought-transmission is not an occult phenomenon, and we are not dealing with professional thought-readers, but with experiments conducted by scientific men with the strictest precautions. Thought-reading is possible under certain conditions, as will be shown presently.

When did the higher phenomena show the first signs of decadence? A moment's reflection will fix it at about the date of the promulgation of the theory of suggestion. As soon as it was found that the hypnotic sleep could be induced by suggestion all other methods were practically abandoned. It was a much easier operation than

to make passes over a subject for an indefinite length of time, accompanying the passes by fixity of gaze and intense concentration of mind. The law of suggestion is undoubtedly of the highest significance, only let us remember that it is not the whole of psychic science. It seems clear, then, that it is to this change of methods that we must look for an explanation of the change in results.

One of these phenomena—familiar to the old mesmerists and vouchsafed by men of learning and standing—is **"Clairvoyance,"** the subject seeing objects with closed eyes, and things that are invisible to the ordinary sight. Anyone examining the voluminous literature on the subject must admit that at all events some of the experimenters took every possible precaution to prevent self-deception or fraud. "Clairvoyant power" may or may not exist; only those can express an opinion who have undertaken the investigation. Why should it be thought impossible that there is a peculiar emanation in certain forms of matter, the action of which is perceived by certain "sensitive" people, especially when in the hypnotic state?

Hypnotists, who practise "suggestion" only, are bound to frustrate their own experiments in this direction and fail to produce any of the extraordinary phenomena mentioned, because of the fact repeatedly stated, that **suggestion,** whether consciously or unconsciously exercised, **is the most potent force,** and therefore does not give the innate powers of the subject a chance to manifest themselves. **Conscientious investigators should remember this.** Only those of our modern hypnotists who do not limit themselves to the suggestion method have succeeded in reproducing the higher phenomena. In the subject put to sleep by the mesmeric method, that is by passes without contact, and with no verbal suggestion of any kind, and who has never been hypnotised by any other person (for the memory of past hypnoses by the subject is a great factor in determining the condition of the present state), we have, and there we must agree with the mesmerists, instead of an interesting automaton, an individual with a personality of his own, one whose mental faculties have become clearer and more powerful, and who often exhibits an intelligence and capacities superior to those of his normal condition.

Clairvoyance, psychometry, and all the higher at present unaccountable phenomena, which the old mesmerists produced, may be true or not true, but of one thing I am convinced: **They cannot be ascribed to thought-transmission** or thought-reading, by which modern critics explain them, when the facts are forced on their attention so that they can no longer deny them. As if thought-reading—the power of seeing into another man's soul—were at all less wonderful than the power of seeing through a stone wall or a floor! To my apprehension, thought-reading is still more wonderful and incomprehensible than that kind of clairvoyance which takes note of material things at a distance. In the latter case we can imagine some subtle, rare medium by which impressions may be conveyed to us, as light or sound are. But how do we perceive thoughts, not yet expressed, in the mind of another? We account in this way for an apparently unaccountable phenomenon by one still more incomprehensible.

Sometimes the phenomena I have described cannot be produced at the first attempt. The subject has to practise the performance, otherwise he or she is liable to guess, instead of waiting for what I may call for want of a better term—intuition.

I may mention also that I have given several public demonstrations of the phenomena I have cited—the biggest one before an audience of five hundred people at the opening meeting of the Ethological Society at the Suffolk Galleries in 1904—and several private séances at the houses of learned friends. Unlike those of most other experimenters, my subjects have been new ones; they had not been hypnotised before. And I have always experimented in the waking state, that is to say, on subjects awakened from hypnosis, so that there was no outward sign of any difference from their normal condition.

In the physical sciences, it is easy to demonstrate discoveries and to have them

repeated under exactly the same conditions. When we come to the science of mind, however, all the circumstances are changed. True, we have our anatomists and physiologists working with the scalpel and microscope, but even as regards the most elementary phenomenon, say man's reasoning capacity, how much have we learned from them ? No one will deny that man does reason, and that, compared to animal intelligence, human reason must seem something supernatural. Is it a wonder that to everyday men the abnormal capacities of the hypnotised sensitive persons should seem incredible ? Why should man in the progress of his evolution not have developed powers—and may we say brain-functions ?—of which we have still only meagre knowledge ? Hypnotised subjects must practise the higher powers just as every man must practise his reasoning capacity, not to arrive at wrong conclusions. Man's reasoning capacity has been trained for thousands of years ; what has humanity done to draw out the psychical sense ? Therefore let us assume a different attitude towards such abnormal phenomena, when they are manifested spontaneously and not with the object of a pecuniary gain. We have given up the explanation of their being supernatural. Let us also give up the idea that they belong to fraud and imposition, and that only highly credulous persons believe them.

Is it possible for one mind to act on another where the two minds do not communicate by the spoken word or by signs or symbols of any visible kind ? This is a question which has set a great many people thinking, and not a few to make observations of their own and investigations of the experiences of others. As a result, those who have studied the subject have no longer any doubt that communication is possible between mind and mind otherwise than through the known channels of the senses ; but that such communication is rare, because **its manifestation requires exceptional conditions.** Before all, there must be a mind willing strongly to impress a thought ; and a mind in that state of subjectiveness or passivity which alone makes it possible to receive the impression.

The phenomena which we are about to consider must not be confused with those, improperly termed thought-reading, which are produced in persons who, by virtue of the extreme sensitiveness with which they are endowed, are able by the mere contact of their hand with that of a person formulating a certain thought to perceive the unconscious muscular movements, and, in consequence, to execute correctly the thing thought of.

That form of pastime used to be played in drawing-rooms, and usually as follows. One of the party, generally a lady, leaves the room, and the rest determine on something which she is to do on her return—for example, to take a flower from some specified vase, or to strike some specified note on the piano. She is then recalled, and one or more of the " willers " place their hands lightly on her shoulders. Sometimes nothing happens ; sometimes she strays vaguely about ; sometimes she moves to the right part of the room and does the thing, or something like the thing, which she has been willed to do.

This looked at first like a promising starting-point for a new branch of scientific inquiry, but it is pretty obvious that the *will* of the player generally expressed itself in a gentle *push*. Even when the utmost care is used to maintain the light contact without giving any impulse whatever, it is impossible to lay down the limits of any given subject's sensibility to slight muscular impressions. The difference between one person and another in this respect is very great ; on the other hand, the " willer " may be quite unaware of the pressure he applies according as the movements are on the right track or not, and which afford a kind of " Yes " or " No " indication quite sufficient for a clue.

An experiment that is frequently performed is that of **thought-transmission without contact.** A number of people, seated in a circle, are requested to think of a particular number or article. The subject, who has previously been blindfolded

outside the room, is brought in and led to a seat in the centre of the circle by someone unacquainted with the arranged idea. Certain individuals are so gifted that after a few minutes they will have a vision of the number or the article on which the minds of those present are concentrated.

Such thought-communication between individuals, especially between close relations and persons in sympathy with each other, is indeed nothing uncommon. But to produce such a phenomenon *at will* is an activity of a kind different from its accidental occurrence.

Undoubtedly communication is possible both in the waking state and the hypnotic state between mind and mind otherwise than through the known channels of the senses. **Telepathy** is, in effect, a convenient phrase under which we group all those unaccountable phenomena which we attribute, some rightly, some perhaps wrongly, to the action of mind on mind where the two minds do not communicate by the spoken word or by signs or symbols of any visible kind.

It is, of course, impossible for us to know the process employed in the ordinary communication of subjective minds. The communications that telepathy conveys appear to be **feelings** or **impressions** which in some cases raise ideas and in some cases do not raise ideas. The degree of clearness of the mental image is largely determined by the intensity of the thought compressed in the act of its transference, whether intentional or not. The state of clearness and the activity displayed by the operative functions of the mind that receives the message will also affect the result. This clearness will chiefly be determined by the state or degree of quietude indulged in during the thinking. The impression made upon the recipient brain is transferred outwards. In other words, there is a hallucination produced, and that hallucination will vary according to the general experiences and knowledge of the recipient. That is why the same message or impression reaching different persons may produce different hallucinations and be interpreted differently.

If we assume that a nerve-force or some other still unknown energy can radiate from the brain, and that such force may travel and strike a brain, which is in tune with it, that is to say, is in a passive state, we have bridged the difficulty of "telepathy."

That an impression striking a passive brain should produce an image which is transferred outward is nothing uncommon, and is often caused by other stimuli—electrical, chemical and mechanical—as evidenced in experiments upon animals. Various forms of auto-intoxication may supply the stimulus in certain diseases, as, for instance, in migraine, epilepsy and hysteria, in which subjective visual phenomena are of frequent occurrence, ranging from flashes of light, plays of colours, to actual hallucinations. The same may also be produced by the alkaloids present in certain poisonous drugs introduced into the system, such as opium, etc. Again, it may be due to some subtle stimulus acting from one part of the brain on another during certain states of consciousness, as in dreams; why not, then, from one brain to another?

Let it be granted that whensoever any action takes place in the brain, a chemical change of its substance takes place also, or, in other words, an atomic movement occurs; and let it be granted that no brain action can take place without creating a wave of undulation in the all-embracing ether; why might not such undulations, when meeting with and falling upon duly sensitive substances, produce impressions? **And such impressions are "felt," not thought of.**

Such oblique methods of communicating between brain and brain would probably but rarely take effect. (I have already mentioned that I have never succeeded in thought-transmission.) The influence would be too minute and subtle to tell upon any brain already preoccupied by action of its own, or on any but brains of extreme, perhaps morbid, susceptibility. But if, indeed, there be radiating from living brains any such streams of vibratory movements, these may well have an

effect even without speech; and be perhaps the *modus operandi* of " the little flash, the mystic hint," of the poet—of that dark and strange sphere of half-experiences which the world has never been without. It is quite open to surmise some sort of analogy to the familiar phenomena of the transmission and reception of vibratory energy.

A swinging pendulum suspended from a solid support will throw into synchronous vibration another pendulum attached to the same support if the period of oscillation of the two be the same ; the medium of transmission here being the solid material of the support. One tuning-fork or string in unison with another will communicate its impulse through the medium of the air. Glowing particles of a gas, acting through the medium of the luminiferous ether, can throw into sympathetic vibration cool molecules of the same substance at a distance. It is also said that a permanent magnet brought into a room will throw any surrounding iron into a condition similar to its own, though by what means of communication is not known. Similarly, we may conceive, if we please, that the vibration of molecules of brain-stuff may be communicated to an intervening medium, and so pass under certain circumstances from one brain to another, with a corresponding simultaneity of impressions.

However, when we admit that all thought is connected with cellular vibrations, we comprehend easily by analogy what happens in mental suggestion at a distance ; the communicating cerebral zones may be compared with two pianos or two harps which vibrate in unison, or to two tuning-forks which give the same note, and of which the one repeats spontaneously the vibrations given by the other ; they may be again compared with the wireless telegraphy stations more or less perfectly attuned. If we suppose two men in whom the cerebral cells vibrate harmoniously, whether in consequence of a bond of kinship or friendship, or because one of them, the magnetiser, has imposed his rhythm on the other, the magnetised, their brains may perhaps be in the same relation to each other as two tuning-forks ; all live thought which causes vibration of the one is able to make the other vibrate without impressing the various brains which are on the line of the vibrating wave. The brain of the subject impressed plays the *rôle* of the resonator ; the impression produced will arrive much more easily at the consciousness of the subject as the latter is less disturbed by other impressions. That is why it is important to choose for experiments of this character a time when we believe the subject to be disengaged or half asleep.

In many cases of telepathy, such a long interval has often elapsed between their occurrence and recital that the imagination has had leisure to fill up the gaps of the memory. Others are second or third-hand recitals. Still, there remain a large number of authentic cases worthy of credence to allow us to **keep an open mind on the problem.** Because telepathy is not open to experiment, it is not considered scientific.

In his Presidential Address on Medicine, delivered at the Annual Meeting of the British Medical Association, 1905, Dr. MAUDSLEY expressed himself as follows :

" Without subscribing to the strange stories of telepathy, of the solemn apparition of a person somewhere at the moment of his death a thousand miles away, of the unquiet ghost haunting the scenes of its bygone hopes and endeavours, one may ask whether two brains cannot be so tuned in sympathy as to transmit and receive a subtle transfusion of mind without the mediation of sense. Considering what is implied by the human brain with its countless millions of cells, the complexities of minute structure, its innumerable chemical compositions, and the condensed forces in its microscopic and ultra-microscopic elements, the whole a sort of microcosm of cosmic forces to which no conceivable compound of electric batteries is comparable ; considering, again, that from an electric station waves of energy radiate through viewless air to be caught up by a fit receiver a thousand

miles distant, it is not inconceivable that the human brain may send off still more subtle waves to be accepted and interpreted by the fitly tuned receiving brain. Is it, after all, mere fancy that a mental atmosphere of effluence emanates from one person to affect another, either soothing sympathetically or irritating antipathetically ? "

The brain, from which the thought is sent out or liberated—whether voluntarily or subconsciously—must act with intense force, such as we can imagine is the case when a healthy strong man suffers death by violence on the battlefield, when his entire life-force is sent vibrating through the air, and his thoughts are concentrated with all the power possible upon his sorrowing wife or his child, whom he may never see again, or his father or mother who are anxiously waiting for news from him. On the other hand, the clearness of the impression will depend on the state and degree of quietude of the person receiving it. If the recipient is actively engaged in some occupation so that his or her own brain is " energising," no impression can be made. **The passive condition is essential for the successful transmission of telepathic communications.** The more perfectly that condition is attained, the better will be the impression. Hence most messages are received in light sleep, or on just going off to sleep, or while resting in a chair in that relaxed state that is very much akin and often leads to sleep. That is why such visions occur most often at night. The brain is then resting, or at least not consciously functioning. During the day we are too busy. or rather our brains are too busy, besides receiving a multitude of subconscious impressions from our active and noisy surroundings, so that such a subtle impression coming from a distance is likely to pass unnoticed.

The impression may be so slight that it is merely " felt " by the person and its effect is merely that of " uneasiness." It need not raise any ideas at the moment. Or the impression may be so intense that a vision of the sender and the scene from which the message was sent may be projected from the brain and appear as real. A mother experiences a sudden anguish and sees her husband or child in peril in clearly defined conditions. She is able to bear witness that this presentiment or vision occurred exactly at the time when the person, being in peril or in danger of death, thought strongly of her and transmitted to her by unconscious mental suggestion the image or the picture of the perilous circumstances in which he was placed. The vision need not be at all accurate. Friends see, as a rule, the person in the clothes that they are familiar with, owing to his having worn them in their company, or they see him dressed in some other more or less undefined garment. The reason for this is that it is some form of brain-energy which strikes the passive recipient, who then interprets the message in accordance with his own recollections. It is the person's spiritual image which is transmitted, and not the image of his clothes, or his beard—which he may have allowed to grow since they saw him last —nor anything material whatever. Only his spiritual image, and possibly an image of the form of danger that threatened him and caused his life-energy to vibrate. An apparition, therefore, is nothing more or less than an intensified telepathic vision. In all cases, the interpretation of the feeling experienced or **the vision seen will be in accordance to the experiences and knowledge of the recipient.**

Such messages and visions are rare because we are so rarely in a " receptive " state. The noises of civilisation, not ceasing even at night ; the fatigue caused by the strenuous work of the day blunting the sensibility of the nerve-cells and causing sleep to be either too deep or to be disturbed by dreams ; the attitude of indifference of most people to matters spiritual—all these are factors that make it difficult, if not impossible, for such communications to reach our brain, or to make an impression upon it. Moreover, we are so accustomed to see things that are not, and hear sounds and even voices that have no foundation—in our healthy, active, waking state, as well as in our dreams—that we dismiss them instantaneously as an

error of our senses, whenever they occur, and think no more about them. A telepathic communication has therefore very little chance of being accepted. Some people, again, suffer such fear and anxiety regarding the welfare of those whom they love and know to be exposed to injury that they dismiss the impression as the result of their fancy, and frequently it is proved that their fears were quite groundless. Another objection is the adaptability of the memory in the case of a premonition having been dismissed and again recollected when news came confirming it. These are some of the reasons why, of the thousands of deaths and times of danger to those whom we love and hold most dear, so few authenticated cases of telepathic vision are recorded. Many people will reply: "What a good thing these ethereal communications are rare, for who wants to be disturbed by uncanny visions?" I agree, but this objection is beside the question, which is not whether such experiences are desirable or not, but whether *they are possible.*

One of the differences between matter and spirit is said to be that the former is perceived through the sense of touch, while the latter is intangible; but this explanation is insufficient when we have persons so sensitive as to have the knowledge of a stranger intuitively, and telepathic apparitions of persons dying are accepted as actual occurrences. One condition for telepathic phenomena is that the recipient should be at the time of the communication in a passive state; hence they are most frequent at night when in a semi-state of slumber. This would also point to mind being a force, the energy sent out by the dying person being all the greater the younger he is and the more violent and unexpected his death. There must be a bond of union and sympathy between the sender and the recipient, that is to say, they must be tuned alike to cause the brain-cells of the recipient to vibrate alike and produce the vision, or feeling that something unpleasant has happened.

The emotions attending a death by violence are necessarily of the most intense character. The desire to acquaint the world with the circumstances attending the tragedy is overwhelming. The message is not for a single individual, but to all whom it may concern. A **ghost** does not travel from place to place, and show itself promiscuously, but confines its operations to the locality, and generally to the room, in which the death-scene occurred. In the castles of bygone times the walls were thicker, there were fewer and smaller windows, and hardly any ventilation, hence the energy that was created by such a circumstance would cling to the room. Moreover, the room in which a murder occurred would most likely be shut up and never be used again. If, years after, some new tenant inhabits the death-chamber, he may when in a passive state receive an impression, which he translates into the vision of a ghost. Then it becomes known that the room is "haunted." One man is pluckier than the rest, says he will sleep in that room and slay the ghost should he meet him. He waits and waits, sword in hand, but no ghost appears. Then he tires, and just as he is on the point of falling asleep his brain, too, receives an impression—and the ghost stands before him, frightening him out of his wits, like the rest. This is an explanation which has the charm of reasonableness, and I know of no better to account for the occurrences which are authenticated. This theory would also explain another peculiarity of ghosts, that they invariably disappear, never to return, when the building which was the scene of their visitation has been destroyed. Another building may be erected on the same spot, but the ghost never reappears. The powerful emanations at the time of danger may account for the fact that the ghosts which are best authenticated, and which seem to possess the greatest longevity, so to speak—are of those who have died under circumstances of great mental stress or emotion. Another salient characteristic, which seems to be universal, and which possesses the utmost interest and importance in determining the true source of the phantasm, is that it possesses no general intelligence. That is to say, a ghost was never known to have more than one idea or purpose. That one idea or purpose it will follow with the greatest pertinacity, but it utterly ignores

everything else. A ghost is, therefore, nothing more or less than an intensified telepathic vision; its objectivity, power, persistence and permanence being in exact proportion to the intensity of the emotion and desire which called it into being.

From what has been said, it must be evident to the reader that **there are forces in human beings, spiritual and other, the presence of which with our present knowledge we can only surmise;** and that **there are faculties and capacities in the subconscious sphere higher in their nature than those which belong to the conscious life.** Some people seem to possess more of them, others less, and some apparently none. Naturally, those who are not gifted with them are the most sceptical. No wonder either that scientists are indifferent to problems that cannot be solved by the aid of instruments and calculations. But by reason of this abstention on the part of scientists, whether through timidity or indifference, these great problems remain unsolved. But the time has come when these questions which exercise the human mind have to be answered. The methods of the physical laboratory are of no avail in such an investigation; but that does not prove their non-existence. Some people will object to the term "forces." Call them what you please, explain the phenomena as you like; but do not ridicule the subject: Go and investigate it!

The subject is of great importance, for if—as shown in this chapter—the mental powers by the process of hypnosis can be accentuated in their activity and new unsuspected capacities manifest themselves in that state, it is possible that certain persons can put themselves in that state by *a habit of profound abstraction* and may be capable of higher things than in the ordinary conscious state. The Mystics, mentioned in the first part of this work, may have been such men, the inspirations of genius may be due to that habit, and the disclosures of supernormal phenomena of media in spiritualistic séances may be explained on that basis.

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CHAPTER XXXIX

THE SPIRITUAL NATURE OF MAN

SURVEYING the contents of this work, the reader will find that, while it contains considerable material concerning the mechanism of human thought, emotion, and conduct, the great problem of the soul is still as mysterious as it was in the early history of man, and all the knowledge we possess regarding it consists of the speculations of metaphysicians and the revelations of religious prophets of ancient times. Science, and even psychology—since it has become experimental—have ceased to concern themselves with the soul of man. In giving some of my reflections on this subject in the succeeding pages, it must be understood that they are purely personal opinions. Having so far kept to strict observations and deductions from fact, I want to avoid making sweeping conclusions in the final chapter of this work.

Before giving my views let me point out :

(1) Although the evidence for brain-localisation produced in this work refers largely to very complex states of mind, it is only the **elements** of our mental qualities which have definite areas of the brain as their physical basis.

(2) These elements comprise not merely intellectual powers, but also the emotions and propensities. In fact, the latter have a directing and preponderating influence over the intellect, and constitute the " character " of man.

(3) These elements of intellect and character are inborn. They are alike in all men, and differ only in inherent capacity of development.

(4) On the basis of several hundred cases it has been shown that it is highly probable that the elements of the intellectual capacities belong to one region of the brain, the elements of the sentiments and affections to another, and the primitive propensities to a third ; and that circumscribed lesions of the brain, whether due to injury or disease, affect the mental quality connected with that limited area.

(5) It has also been shown that man can under certain conditions manifest capacities above the normal, that by taking thought or following definite aspirations he can control his inherited tendencies and acquired mental habits, and that he even has the power to initiate, arrest, and change physiological functions. From this fact the conclusion may be drawn that the physical mechanism of the brain and body can be subjected to spiritual influences under certain conditions and by appropriate training.

The wonder of man's spiritual nature has not grown less with the years which have brought increasing knowledge. Modern science has swept away many superstitions, but it has brought the infinite mystery of things still more clearly home to our human hearts.

By the term " spiritual " is usually meant the opposite to physical, but it has to be remembered that man has always attributed to spirit that which he could not explain on a physical basis, and that under spiritual may be included, not supernatural or supernormal, but merely " unknown energies." Of course, science can take account only of such phenomena as can be reduced to laws. But laws mean nothing but regularity of action ; they are not creative forces, but only the rules by which such forces act. For example, when we speak of the law of heredity, we have

explained nothing. We have only given a name to the marvellous fact that some potency lies in each seed or egg which causes it to produce a plant or an animal from which the seed or egg came. No explanation is given of this power. Some undiscovered force or energy is there, and since forces are not visible except in their results, man regards those forces which apply to his own nature as spiritual. Supposing, even, we could explain the process of heredity, the natural laws which govern plant and animal life, and the complex machinery of the body governed by the brain and the nervous system, these processes and laws would be no less marvellous.

THE PROBLEM OF "LIFE"

Life manifests itself in two ways—as structure and as activity; but it is a living structure and a living activity. Organic matter is life matter. The whole body—all the organs, the bones and muscles, and even the skin, the different parts of the eye and of the brain, are made up of live cells. The whole body is a vast and harmoniously co-operating aggregation of cells, each of which is in a sense a vital unit, with a life of its own, relatively independent of the rest of the body. **The whole body consists of living structures with individual energies; but it nevertheless preserves its own personality.** It does not become real matter, as the word is generally understood, until the cessation of life.

We cannot speak of real matter when we are dealing with organic substances. Is the liver matter? Is the body as a whole matter? In sound health we have no consciousness of either. Except for the weight of the clothes, we should not know we have a body. We have to touch it with the hands to become aware of it. Therefore, so long as there is unhindered vital activity in an organic body, it is a live thing, not matter. And even if it were real matter, we now know that matter is not the inert helpless clay in the hands of the potter that our ancestors believed it to be, but that tremendous energies are locked away in the minutest atom. It is no longer possible to talk about solid matter acted upon by mysterious forces; the mysterious forces may almost be said to constitute matter. Matter is alive. Matter, as we now know, consists of innumerable "electrons" and "ions" in constant motion. Do not the X-rays show matter to be almost ethereal? On the other hand, so-called spirit cannot be contemplated with our senses except as having form—except as "materialised."

Science does not deal with life, but with *biological facts*. The two essentially distinctive properties of living matter are the *power of growth* and the *power of reproduction*. All living things *grow by intussusception* and *multiply by division*, whereas these properties are not found in any non-living thing. Life propagates life; **life is eternal.** We all develop from one single cell. The elementary living organism, when it divides by fission, gives rise ultimately to an infinitely larger mass of living matter composed of units retaining the character of the ancestors. The original cell contains in itself a mechanism capable of reproducing countless millions of complex cell mechanisms in their proper spatial and other relations to one another. Now, the question is, what is the power which enables this germ-cell to build up the body and give us all our physical and mental attributes, our personal characteristics and distinct individuality? What is the force that gives this bit of protoplasm the capability of becoming a living, thinking, and loving being? We do not know. Anything that is physical can be made from other material things by man. Nothing approaching to the cell of a living creature has ever yet been made.

The first condition of the power of growth is a *power of assimilation*—a power whereby a living thing is enabled to appropriate from its surroundings materials which can subsequently be converted into the protoplasm of its own body. This accounts for the great characteristic of protoplasm, namely, its *instability*. It is

constantly in motion ; it is continually undergoing decomposition and reconstruction. It assimilates food from its surroundings, takes up matter and energy constantly, and gives them off by an automatic process. Nutrition is a primal necessity. A life-cell must get material to live, or else must die. Living matter has another peculiarity : it is composed of the same elements as dead matter, but though these elements constantly enter and leave it, the living organism, nevertheless, *retains its individuality and activities.* The response to any stimulus is determined in relation to the life of the organism as a whole.

The living body consists of many organs—brain, heart, lungs, stomach, kidneys, etc.—*all separate yet all one.* All separate, so that each has its own method of work and times of rest. Even the design of one's finger-creases, one's voice, and one's handwriting are individual. There are probably in the whole universe no two living beings exact in counterpart. Yet all our parts are one. Through it all runs a living energy which keeps us alive, and death comes to it as a catastrophe by the fault or decay of its subordinate ministers—the brain, heart, lungs, or other structure. Life seems a continuous adjustment of relations in an organism in relation to its environment. To maintain that adjustment it requires *individual exertion.* Disturb that adjustment, and we get disorder or disease ; destroy it, and we have death.

The human body has been represented as a machine, but it is a machine only in a certain sense. It is a *living, automatic, self-reproducing, self-regulating, self-repairing* machine, unlike any other. Behind every other machine there is a living being who has made and started it, without whom it would not exist or go. Nature repairs ; man can only guide the repair and hasten it. As vitality decreases, so the tendency to repair diminishes. One other distinction : the human body *profits by experience ;* no machine does so.

The human body has also been represented as one great laboratory, in which the most varied processes—assimilation, respiration, secretion, excretion, generation, sensation—go on harmoniously to maintain a unity of being, though each is liable to incalculable disorders. Man's life undoubtedly consists of vast chemical and physical processes, but *not entirely* so. Death does not stop these processes, for they go on more briskly than ever in the corpse after the withdrawal of that something that held together and harmonised them and kept them in check. When this process, which we call life, ceases to act, the body or bodily organ resolves itself into its natural, inorganic elements, and the tendency to individualisation is destroyed. We can buy pepsin at the chemist's and digest beef with it in an egg-cup ; but the human mind can retard or accelerate the same bodily process, and this is an element which eludes chemical and physical investigation. The physico-chemical formulæ do not suffice for a complete description of the vital function. They have explained, no doubt, separate processes, but they have not explained the way in which they work into one another's hands, so that a unified effective life results.

Just as the soul has been lowered from its spiritual conception to something that can be pulled to pieces in a dissecting-room, so chemists have tried to produce life and have failed. **If life is solely a chemical process, how is it that we can by mere thought retard its physical and chemical actions or accelerate them,** by cheerfulness raise and prolong its activity, and by gloominess depress and shorten it ? A thought, an emotion, may prostrate a man as effectually as a blow on his head from a hammer.

If life is solely a chemical process, how do mental states affect nutrition, digestion, respiration, circulation, secretion, reproduction, etc. ? The biologist can explain the necessity for breathing and the regulation of breathing, for example ; but not what produced an emotion which heightens or diminishes that activity. The effect of depressing emotions (anxiety, fear, melancholy) appears to arrest the nutritive energy of the brain and nerve centres, so that the trophic supply to the bodily organs and muscular structures is diminished, the body gets thinner and

thinner, and the man may die, *even when feeding normally*. The opposite example is that of people suffering from a serious disease struggling successfully to get well, or to keep alive, for a certain period until they have accomplished a task which seems to them necessary before giving up life.

The explanation of life, as far as science is concerned, is bound to be a physico-chemical one. A vital force cannot be discovered anywhere. Yet, to explain the action of the bodily organs, some form of *energy* must be assumed. Life consists primarily in an impulse to capture energy, to store energy, and to release energy. The germ itself, which is perpetual, is a highly complex centre of potential energy ; and the organism it gives rise to, which is perishable, is another complex of energy. The question can only be whether life is an energy different from any other known energy. Does not the physician take for granted that there is some energy at work—an energy which he cannot define—which quickens or diminishes the activity of the bodily organs, when he tries to raise the constitutional force of the patient, his " vital energy," his power to overcome, or resist, or prevent disease, by various measures ? Does not the success of a surgical operation to some extent depend on the vital energy of the patient ? Regarded in this light, death is the loss of vital energy, the inability to resist antagonistic elements.

The biologist may reply that the maintenance of life consumes no energy, that life borrows from the external world all the energy which it expends, and that the functions of the body merely transform that energy. For example, the muscle is not destroyed in its functional activity, but it grows. The same is true of the brain. The biologist can measure the shortening of a muscle, the pull it produces, the oxygen it absorbs, the electrical changes which accompany its excitation. Yet those who regard life as some form of energy will point to the fact that, having done so, we are no nearer to understanding a mental act, or a variety of mental acts totally opposed to one another, which can set the same muscle into activity. The biologist describes the structure and activities of parts of the body, but not of the organic whole, just as the experimental physiologist and the experimental psychologist describe parts of the organs and mental functions, but not body or mind as a whole.

Biology does not explain either the cause or purpose of life. The biologist describes physical and chemical action, but that is not the life itself. The physicist may make the dead man kick, as he may make little fragments of iron dance—in both cases by the excitation of electricity—but the action is not life in either case. He can increase or he may stop life's actions ; but he, so far, has failed to manufacture life.

When life becomes purely chemical it is no longer life, for life is not merely a growing and decaying ; it is a struggle against adverse forces—degradation from within and destruction from without. Altogether, **there is more in life and mind than can be discovered in the laboratory.**

For example, Professor ARTHUR THOMSON, writing from the biological standpoint in one of the quarterly journals in 1911, instanced the remarkable story of the eels in Northern Europe, which, beginning life in the silent depths of the mid-ocean, migrate as little three-inch larvæ to the rivers of the Eastern Baltic, three thousand miles from their birthplace. Several years later these eels, now full-grown, set out on an exciting journey to the far-away spawning-grounds, never to return. Can the physiology which is only applied physics and chemistry explain all this ? asks Professor Thomson. Does it even help to make the biological fact of migration more intelligible ?

CONSCIOUSNESS

The new-born babe is a kind of vegetative animal, whose existence alternates between drinking and sleeping, and whose consciousness, if any, is very vague and

develops gradually—from subconsciousness to consciousness, and from consciousness to self-consciousness. There is a brief period at the beginning of its life when the infant is unconscious of anything but a few sensations, and a longer period elapses before it is conscious of the outer world as distinct from itself.

Consciousness is not a faculty or substance, but a quality or attribute incidental to mental processes. Psychic states, being always changing, we ought really not to speak of consciousness, but only of states of consciousness. Yet self-consciousness has the character of continuity, being connected with the past through the memory; otherwise there would be no personality. Self-consciousness is the feeling we have that the mental processes belong to our personality. It arises from the reflections which go on between the individual creature and its environment as it adapts itself to it and adapts it to itself, waxing with the progressive increase of reflection in the ascending scale of animal life to its highest expressions in man. The ego by itself means self-consciousness, *i.e.*, consciousness of consciousness. As BORIS SIDIS, the well-known American psychologist, says: "The central point of the ego or of personality lies in the fact of the thought knowing and critically controlling itself in the very process of thinking, in the very moment of that thought's existence."

The common notion of consciousness is taken entirely from this self-consciousness or reflective consciousness. That is how the older psychologists limited mind to conscious states; but we can have thoughts and not be conscious of them, so that any theory of mind is bound to involve unconscious states. **Consciousness is only a phase of our psychical life, but not the psychical life itself.** So far as there is consciousness, there is certainly mental activity; but it is not true that so far as there is mental activity, there is consciousness. Consciousness may exist in different degrees of intensity or it may be absent altogether. There is a thousand times more below the surface of consciousness than there is above. We flatter ourselves that it is we who are thinking; whereas the thinking is within us, goes on all the time. *We* do the thinking only when absolutely conscious.

Mind and consciousness are not synonymous or co-extensive, for during a particular conscious state all the rest of the mind is dormant. Consciousness knows only the *result* of the work done in the unknown laboratory beneath it.

There is no conscious activity without a much greater unconscious activity. When I sit down to write this essay, it is only the result of my thinking that I put down on paper. The right experiences and ideas come before my mind—become conscious from unconscious regions—from former conscious events and thoughts since relegated to the depths of unconsciousness. All our latent memories are stored in our subconscious mind. Not a millionth part of the mental possessions of an educated man exists in his consciousness at any one time. We may forget objects and events—that is to say, we may dismiss them from our consciousness—but they are stored up in our subconsciousness to the end of our days. We may be able to call them into consciousness by some association when we wish to do so, or they may flash into consciousness for some reason, without any effort of ours; but at other times the mind is unconscious of their existence.

I need only call attention to the well-known phenomenon of "trying to recollect" some name or event. Sometimes no effort of the will can do it, but we wait, and by and by, when we are engaged in something else, the desired idea springs up out of the unconscious. Our decisions in great matters as well as in small show how we trust our unconscious processes. Life would be too short for the humblest activities if we must bring into consciousness all the arguments, *pro* and *con*, for an act, and consider its bearings and results. A large part of our daily activities is governed by motives and processes that never rise into clear consciousness. Consciousness not only blunders, but it is too slow. The man who has to think of his manners is not always polite, for he does not think quickly enough.

The man whose morality has not become automatic will sometimes be surprised in a fault. Even in the most important matters of life we distrust consciousness. We wish to sleep over a matter, not only that our conscious processes may be clearer, but that we may have the help of that unformulated knowledge which, at most, can be said to be only in the background of consciousness. In important matters we often feel confident that a certain course is the right one—as we know an absent road or a face without being able to describe it—but cannot formulate the ground for decision in words. What is termed "common sense" is nothing but a substratum of experiences out of which our judgments flow, while the experiences themselves are hidden away in unconscious regions.

If everything that exists in the mind existed there consciously, or if every time that an idea occurred to the mind all the other ideas that had at any time been associated with it came along with it, and a selection had to be consciously made of the right one, inconvenience and loss of time could not fail to result. In some persons, from habit or lack of proper training, an idea in the mind immediately recalls a number of other ideas, having more or less, and sometimes very little, connection with it, thus distracting the mind with a multitude of thoughts, making the selection of the best a conscious act, producing hesitation and indecision, and causing loss of time. The selection of the right thoughts should take place unconsciously.

The rapidity with which subconscious ideas can pass through the mind is truly marvellous and is shown by the inconceivably quick succession of transactions in our dreams. For example, when we are awakened by the jarring of a door which is opened into our room, we sometimes dream a whole history of burglary or fire in the very instant of awakening. We can dream more in a minute than we can act in a day, and the great rapidity of the train of thought in sleep is one of the principal reasons why we do not always recollect what we dream.

There are many events which are so completely forgotten that no effort of the will can revive them, and the statement of them calls up no reminiscences, which may nevertheless be reproduced with intense vividness under certain physical conditions. Thus persons in the delirium of fever have been known to speak in a language which they had learned in their childhood, but which for many years had passed from their memory; or to repeat with apparent accuracy discourses to which they had listened a long time previously, but of which before the fever they had no recollection. They have even been known to repeat accurately long passages from books in foreign tongues, of which they never had any understanding and had no recollection in health, but which they had casually heard recited many years before.

In the course of my hypnotic practice I have several times revived the memory of a long-forgotten event in a hypnotised subject, and sometimes of a piece of poetry of which the subject had no recollection in the normal state and which I had not heard or read before, thus excluding the possibility of transference of thought. The most remarkable cases, however, are those of persons who have been resuscitated from drowning and who have reported that they had a sudden revelation of all the events of their past life presented to them with the utmost minuteness and distinctness just before consciousness left them.

Some psychologists argue that there is no subconsciousness; but we have no other expression for those experiences, thoughts, and emotions which are not in consciousness at any given moment. Whether we admit an absolute unconsciousness or a relative unconsciousness or subconsciousness, a subliminal consciousness, or a secondary consciousness, or a fringe of consciousness, does not matter much at the present stage, so long as we are agreed that conscious experiences are relegated to another unknown region, or, at least, do not remain in consciousness, but are capable of being revived in consciousness. We know that the man of genius

derives his brilliant thoughts from that mysterious source, the inventor and discoverer his guidance, the poet his inspiration, the religious man his beliefs.

We are in a flux. Attention is centred only on an immediate object, on one object at the time; all the rest is in subconsciousness. Consciousness is therefore *awareness*. Things we are not aware of, we are not conscious of.

Acts which are at first executed slowly, and with full consciousness and attention, become gradually less and less perceptible as they gain in ease and rapidity by repetition, till they fall below the minimum necessary for consciousness, and become unconscious. The more often we repeat a thought or act, the less vivid—the less conscious—it becomes, until an unconscious habit is formed, which tends to reproduce itself spontaneously, so that as much conscious effort is needed to prevent its recurrence as formerly was necessary to produce it. I repeat, that if all our mental and physical operations were performed as painfully and as consciously as at first—walking, writing, etc.—life could scarcely fail to be a burden. Our mental progress, then, is in the direction of our becoming unconscious, or largely unconscious, of many of our activities.

An expert accountant, for example, can sum up almost with a single glance of his eye a long column of figures. He can tell the sum with unerring certainty, while at the same time he is unable to recollect any one of the figures of which that sum is composed; and yet nobody doubts that each of these figures has passed through his mind. It is on account of the rapidity of the progress that he is unable to recollect the various steps of it, and only the result appears by a sort of inspiration before consciousness.

On the other hand, it seems to me a question whether we are ever completely unconscious (notwithstanding RIBOT'S reasoning on this point, "Diseases of Personality," p. 10). As regards sleep, for example, all we can say is that we have no memory of what has passed in that state when awake again. Even under an anæsthetic thinking can go on, as in nitrous oxide anæsthesia; and even in chloroform narcosis, unless very deep, dreaming appears to take place, for patients sometimes utter sounds or talk, though they are unable to feel and have no recollection on regaining consciousness.

Sometimes persons anæsthetised preliminary to a surgical operation have no recollection afterwards of what occurred between the time when they entered the operating theatre and took the anæsthetic, although they may have carried on a conversation with the doctors for some minutes before lying down on the operating table. This is called *retro-active amnesia*. But if they have no recollection of conscious speech and doings before the anæsthesia, what proof is there that there was not some brain activity during the anæsthesia?

My observation of epileptics leads me to believe that there is some mental activity during the attack, and not merely in their post-epileptic condition, before they regain consciousness.

The fundamental character of consciousness is *distinction*. We are conscious inasmuch as we distinguish, and our consciousness becomes more vivid the more clearly we distinguish. In order to be distinguished—to be conscious—a sensation, thought, or motion requires to be of a certain magnitude or intensity, and to persist for a certain time.

We are constantly receiving impressions, thoughts are incessantly passing unperceived, because they are not of sufficient magnitude or intensity to make themselves felt. If a book is read very quickly, so that time is not allowed for the sight stimuli to influence the brain, there is no memory of what is read, because there is no consciousness of it; and when speech is too rapid and blurred, there is a similar absence of consciousness and memory, because of the want of time and intensity.

Yet, though we are not conscious of what we glanced over hurriedly, some passage or other may have registered itself on our brain, and spring up one day like an inspiration, only to disappoint us when we come to know that it is not original.

We have already mentioned that, as a rule, it is only the result of a mental event that we are conscious of, the actual origin and working remain obscure. Even in the conscious act of perception through our senses there is an unconscious process of reproduction exercising an influence. Indeed, even in the cleverest of us, in the ordinary mental operations of our daily life, there is not so much consciousness as is commonly assumed. All things are known to us only as they appear in our consciousness; which appearance, so far as we know, tells us nothing of the reality. All that we know of what is outside of ourselves is only more or less probable inference. That is why we cannot trust our consciousness and the liability of all of us at one time or another to be subjects of hallucinations.

Take an extreme case, that of a man suffering from delusions of persecution. He is positively certain that he sees an enemy where no enemy is; he may hear a voice threatening him when there is no voice. He cannot be brought by the concurrent testimony of everybody about him to recognise his error. It is a physical impossibility for him to doubt the evidence of his own consciousness, because his consciousness shares in the derangement of the mental state which it mirrors when that state is active. When it is not active, he is not conscious of his enemy's presence or plots, but thinks and acts like any other sane person.

An act of attention—that is, an act of concentration—**is necessary for every exertion of consciousness.** The more we concentrate our attention on any particular subject the less we notice other concurrent impressions, and the less we notice also our internal sensations. For example, in times of real danger the body may feel no pain, no matter how severe the injury. When the excitement is gone, then the sensations are felt.

Consciousness runs in personal streams, so long as the brain is stable. As the brain grows, decays, or is influenced by various agents, so will consciousness vary; but the main character, the main self, always remains behind these variations—even in cases of multiple personality. Dissociations of consciousness occur in hysteria, epilepsy, and artificially in hypnotism; but all these conditions are only superficial and temporary, the real personality is not destroyed so long as the brain does not suffer permanent injury.

Consciousness depends on brain activity for its very existence; but the fact that a whiff of chloroform deprives us of consciousness proves only that consciousness is dependent on our breathing air, but it does not prove that consciousness is dependent on brain processes. Still, it is a fact of comparative anatomy that **consciousness increases with the complexity of the nervous system.** With increased size of brain we have varied functions, with strength of feeling in proportion to size and quality; until in man we have all the variety of sense, thought, intellect, emotion, and propensity, all of which are modes of sentience or feeling, and increase our consciousness.

One man has a perfect consciousness of the pleasure derived from the beauty of colours; while another is totally unconscious of any such pleasure. One is conscious of the delight which the reading of poetry and works of highly-wrought fiction affords, while another is not only insensible to the flights of the imagination, but, from a sense of imperative duty, condemns the indulgence in them. Some are conscious of a spirit of benevolence in them, a disposition to do acts of kindness to their fellow-men; others are bound up in self, and have no consciousness of the existence of any power to perform an act that has no reference to their own good. They despise men who cannot live by their own exertions, and they are above giving to others what they do not ask for themselves. Some are conscious of strong

passions and are strangers to the mild and amiable virtues of our nature; while others, those who reason without feeling, and feel without passion, are conscious only of those sources of action which originate in the perfect quietude of the soul. Their consciousness affords no evidence that the passions necessarily exist, or that others are naturally subjected to them.

Consciousness leads the musical person to regard music as an art highly calculated to promote the happiness and refinement of society. The unmusical man, with equal claims to good sense, is conscious of no delight or gratification in hearing it; it is even disagreeable to him, and the other man's estimation of its value not only surprises him, but even begets a sort of contempt for his opinion. The same is true of all the various capacities. An individual with great intellectual endowments by nature is conscious of a greater variety of thought, reasoning, and relation than one whose natural talents are more circumscribed. The former comprehends all propositions with ease, and is conscious of the existence of a power to show their truth or fallacy; but the latter is only conscious of his inability to solve a difficult problem, or of a doubt as to its really meaning anything, because of his want of the necessary power of discernment. Consciousness varies, then, according to our mental capacities. The consciousness of a saint is bound to be different in quality and dignity from that of the sinner or the savage, because the mental contents of the one are very different from those of the other.

Our inherited dispositions—our primary innate capacities, rudimentary emotions, and instinctive tendencies—are **all unconscious.** Only after their manifestation, by reflection on our impulses and conduct, do we become aware of them, and can determine to control them in future. For example, I cannot say, "I am going to 'fear' now." The youth attracted by the maiden does not know why he follows her; he is unconscious of the primary racial instinct which urges him.

Those impressions strike us most strongly which appeal to our characteristic dispositions; the others remain on the fringe of consciousness. **Consciousness does not tell us why some motives have greater attraction for us than others;** we can only say because we are thus constituted, because such is our character. It is only on reflection after the act that most men realise the motive which prompted them to certain conduct. Many men are misers, ambitious, suspicious, conceited, and so forth, without being conscious of the fact; but their fellow-men know it.

The conscious content is of a complex nature and rests upon conscious and unconscious elements. The unconscious differs from the conscious in that it is uncensored; consciousness is the censor of the unconscious. It is by directing our consciousness to the unconscious dispositions, which supply our motives and give rise to habits, that we learn to control them. When we say, for example, that a man is conceited, we do not mean thereby that he could not appear otherwise. We mean only that in his automatic behaviour he manifests the signs of conceit. If he were to direct his attention to the defect in his character, and had the desire to change his manner, he could succeed in altering his conduct; first consciously, and, after a time, he would acquire an unconscious habit of a different kind. Only when taken by surprise, in exhaustion or illness, might the original tendency assert itself again.

We all see the same world objectively, but according to our unconscious minds we look through different spectacles, and the scenery suggests to us different ideas. The unconscious elements are the basis of character, and condition conduct to a far greater extent than the view of life that we express, and by which we believe that we are actuated. Education of the conscious self tends to uniformity in all civilised people. The unconscious self, however, which is built up out of that countless multitude of unconscious impressions and their recurrence coming from their surroundings, customs, languages, national types, physical effects of climate, and many other sources, is widely different. They create an unconscious self in every person, and make him not merely a representative of his times, but produce in him the qualities peculiar to his country, to his race, and to the class in society to which

he belongs, thus stamping him at once with their limitations and idiosyncrasies.

For example, an "educated" Frenchman's opinions—whether he be a merchant, a professional man, or an artisan—may be in no wise different from those of an educated Englishman or of an educated American in the same position of life; he is, as we properly say, "a man of the world." But when, for any reason—emotional, for instance, or through depression or illness, or from a sudden surprise—his conscious self is weakened or fails him, his unconscious self asserts itself, and the national characteristics appear in spite of "intellectual" culture.

We have, then, two states of mind: the conscious or objective, and the subconscious or subjective. As a rule, **the conscious state of mind and the subconscious state of mind work together, and there is no dividing line between them;** so that we feel we are only *one personality*. Both depend on the organisation of the brain with which we happen to be endowed.

THE NATURE OF MIND

Just as life is some form of energy, so mind is some form of energy; but the two are not identical. Mind can only be where there is life; but life is not mind. We must have life before we have mind. There are many things alive that have no mind, but there is no mind without life. When mind is apparently in abeyance, as in anæsthesia, there is still life.

The soul and mind being regarded as identical, **mind was held to be an entity.** But how can a spiritual entity undergo so many variations? How can mind be at one time anger, then suspicion, then acquisitiveness, then veneration, filial affection, musical capacity, arithmetical ability, or perception of locality? If these various psychic activities are merely so many particular states of mind, how do they unite in one personality? And are we not producing in effect the old "faculty psychology"? Mind cannot be a faculty—a little mind in itself—and a binding essence at the same time so as to produce the oneness of personality. For the manifestation of mind nervous centres are necessary, and the force playing on these centres can produce diverse and opposing mental manifestations (see Chapters XXIX.-XXXI.); but these mental manifestations cannot be diverse and opposed to one another, and a unity at the same time. As mentioned already, consciousness runs in personal streams. **Whether we think, love, or are angry, we have always the feeling of individuality.** It is we who think, love, and exercise all the other psychic activities; just as it is we who breathe, not the lungs; we who run, not our legs. The brain may reproduce impressions, but we recognise them. A man can judge himself, his thoughts, capacities, feelings, and actions; it is he who judges, not his brain. If he were purely a piece of mechanism, he could not be at the same time a spectator.

Supposing a person shed a tear on seeing so much deceit and cruelty, so much loss of valuable lives, so much intolerance and hate, as a result of the recent war, which was to end war, which was to be a war for freedom, it would be found on analysis to be only a drop of water containing a little saline matter. That is all that the chemist and microscopist can find in the tear. They cannot discover the emotion that caused the tear, the affection of mind in virtue of which the tear was shed, and, therefore, the physico-chemical explanation of mental manifestations must be inaccurate, incomplete, and misleading.

The products of thought are unlimited and therefore purely spiritual. If mind were limited, if it were an entity, it would have dimensions; but however much is put into the mind, there is always room for more. Inventions originate in ideas, so do artistic creations. They have at first no external existence. Physical and chemical

activity may have a part in it, but do not explain it. The brain elements for such conceptions must be in existence, but the result is a spiritual conception. Just as natural substances become by synthesis transformed into other substances, so the mental elements, which depend on the functional activity of groups of brain-cells, are actually transformed by combination into mental complexes different from those elements from which they started. **The synthetic product of our thoughts is not the same as the elements;** as little as water is identical with two elements of hydrogen and one element of oxygen. It is neither the one nor the other, but a new product. The mechanistic conception of life and mind is like regarding a symphony as vibrations of atmospheric waves. So it is, but that is not all. The mechanistic conception of life and mind does not explain the spirit which animated the heroes of science, who refused to submit their reason to authority, the political leaders who contended for the rights of man, the philosophers who championed liberty, the religious enthusiasts who fought for the right of private judgment and the freedom of the individual conscience. If such a wonderful synthesis as Shakespeare's literary creation is simply the result of physico-chemical mechanism, then we ought to have many Shakespeares, but there has only been one such genius.

No physical or chemical fact can explain man's conception of an Almighty Father. True, human beings with arrested brain growth may be incapable of such a conception; a blow on the head may destroy the capacity in another; still, the conception is spiritual. The brain element has the same relation to it as the eye has to sight. The eye is an essential organ to seeing, but there is no limit to what we may see with our eyes or may conceive with our brains. Moreover, man has the power to change purely animal instincts into refined and lofty qualities; for example, the sexual propensity into the spiritual affection of love. Man is therefore a spiritual as well as a material being. By the power of his spirit he can, to some extent at least, elevate, control, and direct the mental, physical, and chemical elements of his being, can modify heredity, influence his environment, and shape his course towards a definite goal of existence.

If mind were an entity, it should be the same in the infant as in the adult and in old age, but **nobody is constantly the same self.** Mind is a flux just as life is a flux. The only wonderful thing is that we preserve our "identity" in these constant changes. We vary not only at different periods of life and in different circumstances, but also on different days according to the state of the brain and bodily condition—sanguine or gloomy, frank or reserved, apathetic or energetic. We feel, indeed, that there is a continuity through all these changes, but this is because we can recognise by means of our memory connecting links between our successive activities.

Psychologists took some time in discovering that there is a relation between psychical activity and the brain; for consciousness does not reveal to us the existence of a brain, gives no information regarding the operations of the brain, or of the functions of any other internal organ. Man, in general, in the state of health, has no consciousness of the existence or uses of the brain; and in consequence of this want of consciousness, psychologists have for so long ascribed the phenomena of sensation, emotion, and thought exclusively to a spiritual entity which they have named—the mind. But we are not conscious even of having a mind; we are conscious only of mental states and acts.

Let anyone reflect on the vast number of sensations which strike our brain, and the innumerable reproductions and associations that go on all the time, often even while we are sleeping. Let him reflect on the number of his impulses to do certain things, mental and physical, and the elaborate apparatuses with which he is endowed for that purpose—it must appear wonderful to him that he feels nothing of the existence of all these various departments of nervous energy, and remains even

unconscious that he has a brain. We know that we breathe and digest, but we are left to find out, by observation, both the manner and the mechanism ; and it is the same with the brain. That we are not conscious of the various functions of the organic life of the body which go on in quiet harmony with the nicest adaptations of means to ends throughout its complex mechanism is presumably because they have no direct relations to the external world, but are practically self-contained within their own domain, their rhythmical action being mainly with one another. We know nothing of the existence of the machinery, unless it becomes disturbed in one or other of its functions, and the message it then sends to the brain is felt by us as " pain."

Mind being regarded as an entity, this view has given rise to various theories of the **relation between mind and brain.**

(1) We have seen that **it has been held by materialists that thoughts were secretions of the brain.** If this were so, thoughts would be lost as soon as expressed. The brain does not secrete thought, for no secreting organ in our system creates that which it secretes ; it only separates and forms into new combinations the substances which have entered it, and *there is nothing in the constitution of either the blood or the neurones that can be converted into thought,* unless it be the nervous energy transmitted to the central organs. If thought were matter, matter would supply it. But *thought can only be fed by thought.* No mechanical or chemical theory can explain the creation of an original thought—say the creation of a poem, or of a beautiful piece of music before it is written down. True, a brain is the necessary instrument, and in some way retains the production of thought, poem, or melody.

(2) A more moderate view is that **psychical activities are mere functions of the brain.** This view, like the purely materialistic view, does not explain how it is that notwithstanding our brain organisation, which should determine certain acts, *we are able consciously to control mental manifestations,* and even to manifest tendencies opposite to our natural inclinations. Indeed, all education depends upon this fact, whether education of children or the education of the adult, in the reform of morbid habits and tendencies, by what is commonly called " suggestion."

(3) Then there is the purely **spiritualistic** view, which rejects the necessity of material instruments and presumes mind to be an entity alike in all men. But it is through our mind that we know of the existence of matter. Whether a man is a materialist or a spiritualist frequently depends on the circumstance that the one is observing himself and the other his fellows.

(4) Another view is that of monism, *i.e.,* that **mental activities and brain activities are one and the same thing,** or as different states of one thing. According to this view, nothing is psychical without being at the same time physical ; and nothing is physical without being psychical, just as there is no matter without energy, and no energy without matter.

(5) Another view is that of **interaction.** This assumes that the mind and the nervous system are found in juxtaposition, that the nervous system can influence mind, and that mind in turn can influence the nervous system. Interacting dualism postulates a mind acting on the body, just as the body has certain inherent activities independent of the mind.

(6) Others regard **psychical activities as running parallel with brain activities,** with no connection of cause and effect between them, never interfering with each other, yet invariably occurring in correlation, thus supposing an irresponsibility on the part of both. According to this view, which is Leibniz's " pre-established harmony " pure and simple, the physical and psychical processes are equally real, but there is no causal relation between them ; the two series of events, the psychical processes of any mind and the physical processes of the brain with which they are associated, merely accompany one another in time ; their relation is one of simple concomitance only ; the two series of events run parallel to one another in time, as

two railway trains running side by side on a double track, or two rays of light projected towards the same infinitely distant point, run parallel with one another in time and space. But in the case of brain and mind, this fails to explain the connecting link, how this parallelism is brought about.

(7) Another view is that **mind activities occur simply during the functioning of the brain.** This is the most reserved statement and leaves the nature of mind outside discussion.

All these views regarding mind as an entity fail to explain **what starts the impulse in the brain-cell.** Some will answer a chemical process occurs in the brain-cell. But what made it occur just then and in that way ? What is the peculiarity of a brain-cell that transforms a sensation into an idea ? What enables it to receive the sound of words and respond with feelings of love or anger ? Is it the brain-cell that remembers or do I remember ? I can recall at will at this moment not only different items in my present history, but every variety of knowledge I have ever acquired—it is I who do that, who set this mechanism going, not a mind entity, nor a particular brain-cell, which sets it going. To speak of memory as a mere matter of successive nervous events is something like saying that in a phonograph the record on the second half of the cylinder was able to recognise its own likeness to, or difference from, the record on the first part of the cylinder.

We have got no nearer to the solution of these problems since man first began to philosophise and notwithstanding a great deal of scientific research. What is there to show the anatomist dissecting the brain or holding a section under the microscope that a particular convolution of brain-cells is agitated in love, fear, or anger, or involved in the production of a sentiment or in the exercise of logic ? On the other hand, the physiologist deals only with stimuli, excitability, and response. Physical stimuli result in physical responses ; all experimental brain physiology has utterly failed to disclose even the crudest element of mental phenomena.

We must think of mind, not as a self-existing, self-acting entity, but as an energy, working on the brain-cells.

But **if we regard mind as analogous to a force or energy,** it will enable us to surmount the difficulties we have just discussed, and to explain why we have failed so far in locating mental functions ; for we cannot discover a force by dissection.

If mind be a force or energy, we can observe its actions on the brain in health and disease, just as we observe the manifestations of other forces of nature without knowing what these forces or energies are. Take, for example, electricity—it is invisible, intangible, immaterial, and in its essence unknowable, thus corresponding with the nature of mind. Just as electricity is an unknown force, so the nature of mind-force is not known and only its manifestation can be observed.

If we regard mind as an entity, we are obliged to make an immaterial agency produce physical effects—the mind using the brain as a man plays the piano, and causing all the mental operations—and we still have to invent a force by which the mind is able to do so. But mind being regarded as analogous to a force or energy, it is no more wonderful that it should produce physical, *i.e.*, organic effects, than that physical agencies should produce changed manifestations of the psychical activities. Regarded in this light, the effects of thoughts and emotions on the body are more easily comprehensible.

Mind is related to organic matter as force is related to inorganic matter. Force moves inert matter, and mind moves a living substance. **The brain is not a mere machine, but a composite living instrument,** the most wonderful structure in the universe. A machine wears out by constant use ; but the nervous system under normal activity tends to grow.

Mind as an entity fails to explain the manifestation of dissociated, double or multiple personality. But we can imagine mind as a force unable to act on parts of

the brain owing to some localised physical change, thus annulling parts of memory, certain feelings and dispositions, while the remainder of the brain is free to act. Whole areas of memory and characteristic qualities of the person may remain latent for a time, while other elementary qualities, which had never been exercised, are stimulated to activity, producing an entire change of the personality. If we assume mind to be a force or energy, we can understand how multiple consciousness can be produced at one time, as, for example, in playing music.

"Two different sets of hieroglyphics have to be read at once, and the right hand has to be guided to attend to one of them, the left to another. All the ten fingers have their work assigned as quickly as they can move. The mind—or something which does duty as mind—interprets scores of A sharps and B flats and C naturals into black ivory keys and white ones; crotchets and quavers and demisemiquavers, rests, and all the mysteries of music. The feet are not idle, but have something to do with the pedals; and if the instrument be a double action harp (or an organ) a task of pushings and pullings more difficult than that of the hands has to be performed. And all this time the performer—the conscious performer—is in the eleventh heaven of artistic rapture at the results of all this tremendous business, or perchance lost in a flirtation with the individual who turns the leaves of the music-book, and is justly persuaded she is giving him the whole of her soul." (Miss Cobbe, "Macmillan's Magazine," 1870.)

Our potential tendencies are not limited to the bare receiving of impressions; when they are more pronounced, they seek satisfaction. But narrow reality seldom offers this satisfaction and they must resort to disporting themselves in the kingdom of phantasy. It is surprising how many people lead a double existence, an external and an imagined one; the one narrow, the other full of fancied situations, of which they dream they are the heroes and where there is room for their unsatisfied longings and unused powers. This may also explain why poor and uneducated people love the melodrama and penny novelette, in which the good man and woman get their reward and the wicked man and woman their punishment.

Mind being regarded as an energy, it is easier to understand the *changes in our moods:* why we never feel exactly the same one day as compared to another, such feeling depending on the condition of the physical elements, on which the mind force acts; and why, for example, when the feeling is one of lassitude, a piece of good news, *i.e.*, a mental stimulus, rouses the whole organisation. Mind being regarded as a force or energy, we can understand its action on the body; that, for example, when directed to any portion of the body it can change the circulation and nutrition, or molecular constitution of that part. We can understand also the influence some people exert over things by mere mental force, and the power of our own individuality over our brain activities, stimulating some and inhibiting others.

Experimental physiology, seeing only elementary movements and sensations, reduces mind to a mechanical apparatus. Minor data and observations are accumulated, but the greater problems of life and mind are ignored, perhaps justly so, for whenever experimenters venture on generalisations, they are contradicted by subsequent observers. But just as much as I hold that it is absurd to argue that, because the elementary mental dispositions cannot be dug out with the scalpel from the brain, therefore they have no connection with it; just as much as is it, in my opinion, absurd to argue that, because the soul cannot be found with the knife, electric current, weighed in the balance, or detected chemically, therefore it is non-existent—a mere hypothetical construction of the metaphysicians.

The philosophical theory that there is nothing in the human consciousness beside transformed sensations has guided the physiologist in his investigations. Owing to this preconceived notion, he could see nothing in the brain but a physical mechanism for movement and sensation. He failed to discover any apparatus for

the elements of our various mental gifts, because he did not look for any; indeed, he denied there are special instruments for the elements which compose the mind and character of man. All man's characteristics, animal and specifically human, were supposed to be the result of sensation. But man has in him the germs of a rational, social, moral, and religious nature, of poetical, artistic, inventive, and other gifts. External sensations help to unfold them; but the seeds must be there. If we depended on sensation alone, why should a particular impression leave one man unconcerned, inspire another to an artistic creation, rouse in a third the deepest religious emotion, and cause a fourth to exert all his mental powers to follow what he knows or considers to be the right path? Not all truth comes from without; some of the greatest truths have come from within. Is it the external impression that makes the poet, musician, artist, philosopher, inventor? It is something within—and that something within has so far escaped the instruments of the physiologist; nay, even his contemplation.

In all cases where emotions are started by non-mechanical causes—let us say the receipt of a telegram announcing ruin, death, or the realisation of extravagant hopes—the initial movements in the brain are indubitably set up by the mind. How can the light-waves which strike the retina on the reading of the written words account for the exhibition of forces which follow astounding news, different persons being differently affected by the same cause? No hypothesis of sensory brain centres will explain the fact; but, if it be admitted, as I have shown, that the principal emotions—fear, love, resentment—have centres in the brain, then it can be easily understood that, according to the individual development of these centres, so will different people respond differently to the same stimulus.

Chemico-physical changes in the nerve-cells are supposed to be the *cause* of consciousness and of everything which goes to make up what is called "mind" or "soul." Thus that eminent American scientist, JACQUES LOEB ("The Mechanistic Conception of Life," Chicago, 1912) believes that life's wishes and hopes, efforts and struggles, disappointments and sufferings are amenable to a physico-chemical analysis, because he can explain animal tropism, *i.e.*, the tendency of certain animals to fly or creep to the light, on such a basis. He considers this tendency to be instinctive, and, being able to explain the one instinct, he can see no reason why the whole of man's inner life should not receive a physico-chemical explanation. But, in my opinion, the tendency of certain animals to go instinctively to a source of light is not a universal or primitive instinct.

Loeb has undoubtedly made some valuable contributions to our knowledge of the behaviour of animals, and made an original study of the conduct of winged plant-lice—but surely it is a long way from plant-lice to the complex behaviour of man! For all I know, the plant-louse may have some noble inspirations, and as regards food, reproduction, etc., may have instincts identical with man; still, man is so far removed from the insect, that no correct deductions can be drawn from one to the other.

That, however, is not the opinion of Loeb and the school he represents. On the contrary, all that is noble in man is considered by Loeb purely mechanical. "Our instincts," he says, "are hereditary, as is the form of the body, and we obey them 'machine-like'—for we are compelled to do so. . . . We struggle for justice and truth since we are instinctively compelled to see our fellow-beings happy." How many men does Loeb believe do struggle for justice and truth? And what is the physico-chemical explanation of this struggle? "Not only," says he, "is the mechanistic conception of life compatible with ethics: it seems the only conception of life which can lead to an understanding of the source of ethics." May I ask what ethics can there be in compulsion? On a physico-chemical basis practically all men should be virtuous, for they are so organised, and their actions could be foretold.

Loeb goes still farther. Physical chemistry, according to him, will make the facts of psychology accessible to analysis. He believes that the investigation may be of importance even to *psychiatry*. He goes on: "The experiments may also attain a similar value for *ethics*. The highest manifestation of ethics, namely, the condition that human beings are willing to sacrifice their lives for an idea, is comprehensible neither from the utilitarian standpoint nor from that of the categorical imperative. It might be possible that under the influence of certain ideas chemical changes—for instance, internal secretions within the body—are produced which increase the sensitiveness to certain stimuli to such an unusual degree that such people become slaves to certain stimuli just as the copepods become slaves to the light when carbon dioxide is added to the water."

Loeb's view is strictly materialistic. So is the view of modern physiology and medicine. Yet as regards the latter, I shall show that, if we accept their facts as proved, just the opposite deductions may be drawn—namely, that mental activity is purely spiritual. In support of this statement, let me quote again the excellent summary of physiological research by **CH. CHATELIN** and **DE MARTEL** ("Wounds of the Skull and Brain," London, 1918), and their practical observations, "most carefully made," on more than 5,000 cases in the recent war, of wounds of the skull and brain, during 1915 and 1916. Prof. PIERRE MARIE, the great French neurologist, in his preface to the work, says that it "is not merely a treatise of traumatic affections, but will remain as a guide to the study of local affections of the skull and brain. The book is really a great achievement."

Relying entirely on the results of animal experiments, which they quote, no attempt has been made to inquire into possible changes or loss of definite mental powers, such as I have furnished in this work. The possibility of the intellect becoming affected in lesions of the brain is recognised by them in a vague way; but other changes in mental dispositions, and the loss of definite capacities, are not mentioned; indeed, one might well assume, after reading the work, that insanity may be anything but a brain disease.

Whereas according to the evidence produced in this work it would appear that the elements of the various mental powers—intellectual, emotional, and instinctive—are connected with definite parts of the cortex of the brain, the authors found, referring to the four chief lobes of the cerebrum:

(1) "There are *no symptoms* special to wounds of the *frontal* lobes."

(2) "It is impossible to state definitely the reasons why a lesion of the *parietal* lobes *does not show any symptoms*."

(3) "Most of the symptoms described by the classic writers as arising from lesion of the *temporal* convolutions have *no clinical existence*."

(4) Referring to the *occipital* lobe: "*Nothing is known* of the functions of its external convolutions and the symptomatology of this lobe is confined entirely to the disorders arising from lesion of the visual centre in the cortex or of the central occipital tracts."

The authors did notice that "*important lesions of the frontal lobes* are frequently accompanied by *profound disorders of intelligence*" and observed the various forms of aphasia in lesions of the brain; but they produce no evidence that inquiries have been made into the mental state of the patients who came under their observation, such as would be made by men who admit the hypothesis of the localisation of mental functions. Accordingly there is also no evidence that the authors allowed for possible mental changes some time after the operations, as has been shown by me to occur frequently. The whole work is indicative of the universally accepted view that *no connection can be proved between the brain and distinct mental phenomena*—a result that must be most encouraging to spiritualists. It is the latest and most scientific evidence in support of their beliefs. *If the various mental manifestations cannot be proved to have any connection with the brain—they must be*

spiritual, and thus it might be claimed that we get at least negative evidence for the existence of the soul.

THE PROBLEM OF THE SOUL AND IMMORTALITY

The older psychologists, as has been shown, limited the soul to consciousness and intellect, omitting the emotions and propensities. Modern psychology, on the other hand, since it is getting more and more experimental, like physiology, places reliance on physical methods for the explanation of mental phenomena. But because psychology has ceased to search for the soul, this is not sufficient reason for assuming that there is no soul. Notwithstanding all the progress in science and philosophy, we still know no more of the spiritual nature of man than our great ancestors, and the problem must still be left to theologians and metaphysicians. But there are some reflections on which I may be permitted to venture.

Generally speaking, **the soul is assumed to be identical with mind**—the sum total of our psychic activities; but if this description be correct, then the soul appears sometimes in degraded forms, as in the idiot, the drunkard, the sensualist, the habitual criminal. Moreover, such a conception deprives the soul of its unity and freedom. The soul, assuming its existence, must be something higher, for the elementary psychic activities are also possessed by animals; indeed, they seem to be derived from them. In that case animals also have souls. Quite right! it will be said. But there is this objection, that whereas man in consequence of his noblest faculties is capable of refinement of his lowest instincts and of apparently indefinite advancement, there is a limit to the progress of animals.

If the soul were identical with mind, then it would be affected by physical agencies. We know that if the circulation of a man be checked, he thinks wildly or not at all; if his secretions become impaired, his moral sense may be dulled, his aspirations may flag, his hope, love, and faith may reel. Impair them still more and he becomes a brute. Indulgence in wine or spirits may degrade his moral nature below that of a pig. A blow on the head may abolish memory, or consciousness, or result in an entire change of character. If the soul be identical with mind, then it must be assumed to undergo all these variations from virtue to vice, from sanity to insanity.

In all religions the soul is conceived as an entity, and the Christian explanation of its origin is that it is directly created by the voluntary power of God; some holding that all souls were created by the Divine fiat at the beginning of the world, and laid up in a secret repository, whence they are drawn as occasion requires; while St. JEROME (346-420) and other Fathers of the Christian Church maintained that the production of souls was not confined to any past period, but is continued still, a new soul being freshly created for every new birth. This has become the prevailing view. On the other hand, TERTULLIAN (*c.* 160-220) taught that all human souls had their beginning in the soul of the first man, and have been transmitted ever since in accordance with the Divine plan. The soul of the first man was the fountain-head of all human souls; all the varieties of human nature are but modifications of that one spiritual substance. The first parent bore within him the undeveloped germ of all mankind, so that sinfulness and souls were propagated together. He held that souls of children are generated from the souls of parents as bodies are from bodies; but this doctrine is based upon the erroneous belief that the bodies of the parents generate the body of the child, and that correspondingly the souls of the parents generate the soul of the child. Now, we know that the child comes from germ-cells which are not made by the bodies of the parents but have arisen by the division of antecedent germ-cells. On the other hand, it might be claimed that Tertullian's teaching received support from the modern doctrine of the

continuity of the germ plasm. Tertullian's view has been formally condemned by the Roman Catholic Church.

The prevailing conception of immortality is that of a conscious survival after death, preserving a future recollection of our past existence and also our bodies through all eternity. Whether the soul continues hereafter or not is to many of little consequence. They are not anxious about their soul, but about their consciousness. A mere surviving principle would not satisfy them. But our personality is not a static ego looking on, an indestructible monad gathering experience in the world, to be sealed and signed, and then stored up in some unknown region till the day of resurrection. Our personality changes from day to day, and there is but one link which binds the changing states from infancy to old age into one continuous identity, and that is memory. If memory there is to be, then we must carry all our omissions, sins, and pains into another existence. Again, the higher the existence, the greater the freedom from competition, and therefore the less use for the animal part of our nature. But if the animal appetites are left behind us in the grave, our personality is no longer the same. It follows that the obliteration of our personal outlines must keep exact step with our advance towards the divine state, if the soul is to survive.

The continuity of the germ-cell proves humanity to be immortal, but not the individual man; just as the river may be regarded as immortal, but not the drops of water composing it at any particular time. Now, some men are so organised that they believe in a future life and hope for it; others doubt or deny it, or, if they grant the possibility, do not live in expectation of it. Whatever the belief, few people are nowadays influenced in their conduct by it. The good man is given to good conduct; the bad man to bad conduct, either because he is born defective, or because he has not the knowledge that bad conduct is not to his advantage, and does not further his happiness in the long run. Animals, children, and primitive people we must influence by holding out to them rewards and punishments; civilised man wishes to live in harmony with his surroundings, and he is conscious that he can do best by exemplary conduct.

I have shown in an earlier chapter of this work that **there are men who lack the necessary organisation for the spiritual qualities;** just as men are born who lack the elements for the moral sense, or are so organised that they cannot appreciate music, understand algebra, or take any interest in the fine arts, in high-class literature, or abstract philosophy. There are men who lack the sublime devotional feelings inspired by the grandeur of Nature, who cannot contemplate an Almighty Power, who lack all spiritual emotion. They are religiously ungifted. They are not fitted to reach these conceptions and emotions. It is as useless to argue with them as it is for a musician to explain the laws of harmony to a tone-deaf person. But just as much as it would be an impertinent assumption for a tone-deaf person to deny the existence of beauty of music, so it is an assumption for a person devoid of the spiritual sense to deny the conceptions of religious men. **It is from the spiritually gifted men that we must draw our enlightenment on spiritual problems,** and not from the men who lack the necessary organic elements for such investigation, or who, by their devotion to material affairs, have deadened their higher senses. By "spiritually" gifted men I do not mean "mystics" who neglect every law of science and logic, nor necessarily ministers of the Church who, to whatever creed they may belong, are restricted to the interpretation of their sacred books; but simply men who, in addition to sound, practical common sense, possess the elements of religious feeling and inspiration.

Religious feeling is as much a gift as is artistic feeling. The world could exist without either, but it would be deprived of some sources of joy. Religion from the sceptic's point of view is an illusion; so is art to the inartistic. The soul, the Creator, immortality, are beyond scientific proof; so is the soul which the artist

infuses into the human form, the sky, the sea, and his own creations. Doubtless man could live by the gratification of his instincts alone, but he is not so disposed. He loves the ideals which he pictures to himself. A life without ideals would be dreary indeed. The pursuit of the ideal is common to the moralist, the artist, the religious man and woman. Just as the artist has the idea of perfection at which he aims, so the religious man, seeing the imperfections of individual human nature, creates an ideal of perfection, at which he aims and with which, like the artist, he holds communion. He clings to religion for the gratification of his spiritual ideals; but he no longer expects religion to furnish him with an explanation of phenomena —that is the province of science.

Science has made wonderful progress, but, as I have already said, the problems of the First Cause, of the nature of the soul, of the possibility of life after death, the nature of the forces which are beyond our control, are still where they were in prehistoric times. Science has never touched the psychical; it is bound to be material —to be limited to phenomena which can be verified by the senses. That is why theological dogmas have such a strong hold on man, for they set at rest those questions which his reasons cannot solve. True, science has destroyed the meaning of many of the assertions of theologians, so that the intellect of the religious man is no longer satisfied; but it has not destroyed the foundation of religion. Religion is not an invention of the theologians. It arises from certain primary needs of man and provides for his aspirations. Man's heart wants to be satisfied as well as his intellect.

The world will have religion of some kind, even though it should fly for it to the spirit manifestations of professional mediums. It wants the lifting power of an ideal element in human life; something to warm and colour it; something to distinguish human from mere animal existence. There will always be religion; the only alternative is superstition. So long as men wonder whence they came, and what is the meaning of life, and what the purpose of the universe; so long as there are struggles and inequalities of existence, the mystery and sorrow of death; so long as there is tragedy, and mourning, and hope, so long will there be feelings and yearnings and ideas that generate religion. Religion in some form, adaptable to our needs and harmonious with advanced thought, is for most people a necessity and will always be with us. It is the outgrowth of the feeling which animates a large proportion of humanity, that there is something beyond the compass of human knowledge.

It was an instinctive spiritual feeling, and not reason, which gave our ancestors the faith in a great Unknown Power, and made their terrestrial misery tolerable. The more primitive and the less educated the people the more completely their religious conceptions filled such psychical life as they had. As man's intellectual and spiritual development advanced, so his religious conceptions grew broader.

Independent of the various creeds, **all men must grant that there must be a Power in the universe from which all life and energy proceed or originally have proceeded,** a Power which cannot be comprehended or controlled by human thought and will; a Power—not as in past ages identified with the idea of abnormal and capricious action—but, in the present scientific age, with that of regular and unbroken law. It is also natural that mankind in their adoration of God, the "Architect of the Universe," the great "Unknown and Unknowable," and with the desire to revere and worship him, should have represented an ideal personal deity, a "Loving Father," a limited but the only tangible conception that would appeal to their understanding. We cannot conceive even a Spirit without form. Others—particularly many scientists and philosophers—regard God and the World as one.

Seeing the hardships and injustices of this life, the affectionate bond between members of the same family and community, and the frequent premature death, it is not surprising that the idea arose in the earliest times of an existence and union

hereafter. This problem science has not solved ; life in spirit is beyond scientific proof. All that science can say, for the present, is that we live in our offspring and the influence we have exercised on our surroundings. Every life more or less forms another life, and lives in another life. None so humble that he does not exercise some influence which keeps his spirit alive, at least for a time, after the dissolution of the body. Activity on earth in the real and known work of life, in the welfare of those whom we have loved, and in the happiness of those who come after us—therein lies the only immortality science can answer for. As we live for others in life, so we live in others after death. Religion is a necessity, but the belief in a life hereafter is not.

On the other hand, the inference that there is no other life, because the human mind—or, more correctly speaking, some human minds—cannot conceive it, is not inevitable. As matter is constant but undergoes changes, so it may be with man's spirit, in terrestrial life and hereafter. Most people who deny such survival, consciously or unconsciously, regard all man's mental manifestations as the result of his brain activities ; but that this is a misconception, in my opinion, I have already explained. Those who assume a spirit to exist during life are justified in assuming its existence after death ; but as the body perished, it can no longer manifest itself through it, and therefore can no longer have individuality, so far as our limited intelligence can conceive. Such purely spiritual survival, however, is unsatisfying to most men, as is evident from the fact that, quite apart from the various religious beliefs, there are a number of men, some of them very learned, who accept the evidence of so-called " materialisation " of spirits, who believe in survival of both body and mind, and in a life hereafter corresponding very nearly to life upon earth, as if the conditions and environment on which mental life depends were identical with those of ordinary physical existence. Assuming communication between the spirit world and the living to be possible, it is surprising that in all the records collected by societies which investigate these phenomena there is not one message of importance, or one which would throw light on any of the great problems which affect humanity so deeply, not one message that is lofty or holy, or would betray any greater nearness to God. If spirits have nothing to tell us that is of comfort or enlightenment to us, except that they are perfectly happy in the other world, suspicion is justified that these messages arise in the brains of those who attend these meetings. If spirits there are, if they love those whom they left behind them, if there is any love for humanity in heaven, if God could reveal himself to our ancestors, heavenly manifestations are still possible and do not require the intervention of unholy media and their commonplace interpretations. Such is my personal opinion.

All the same, let us keep an open mind on the subject ! It has been shown in the previous chapter that in hypnosis—whether self-induced or induced by others—persons manifest mental powers of which they are incapable in the normal conscious state. A medium may be able by profound abstraction or self-hypnosis to get his own brain impressed by the subliminal mental activity of those who watch his performance. He may not be able to read all that is going on in the subconsciousness of those who wish to communicate with their departed friends, he may become impressed by isolated fragments only ; but since these correspond with the actual memories, the result seems to the persons present so marvellous as to increase their belief in spirit communications. Many of them were probably at the outset favourable to the spiritistic hypothesis, subconsciously if not consciously. This is the most likely explanation, and so long as we can find a " natural " explanation, it would be folly to seek a supernatural one. The phenomena are none the less marvellous, for such unconscious thought-transference is not yet an accepted fact of science, and on that hypothesis investigations should be undertaken.

So little is known of the mental constitution of man, and its relation with his

physical being, that it would be audacity on my part to affirm or deny, or even to argue, on the existence of the soul and a life hereafter. Not until investigations are made on the lines described in this work, not until ethology is recognised as well as psychology, not until brain research is extended from motor and sensory to mental manifestations, and the elementary powers can be defined and their physical bases are discovered, will it be safe to speculate on the soul and spiritual nature of man. Only one suggestion I would venture in conclusion : Every particle of man is alive and adjusted in its function to the whole being, the self, and by his thought and emotion he can control not only his brain activity, but every function of the body, accelerating or inhibiting it. From this it appears to me that instead of saying " man has a soul," it would be more correct to say that " man himself is a soul." He is not a conscious machine, but a spiritual being.

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