





PSYCHOLOGY AND COMMON LIFE

A Survey of the Present Results of Psychological
Research with Special Reference to Their
Bearings upon the Interests of
Everyday Life

BY

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PREFACE

THE object of this book is to select the most important facts from the great mass of material now accumulated by students of psychical research, describe them in language easily apprehended by the general reader, and point out their bearing upon the interests of everyday life. No attempt has been made to cover the whole field of psychology or closely to correlate the topics discussed. Several of the chapters can be intelligently read by themselves, if desired, provided the most elementary facts of mind are kept clearly in view.

Not many generations ago the all-absorbing theme was physics and little attention was paid to other studies. Later biology became the dominant science and gave direction to the current of thought. Now psychology has come to the front and holds undisputed sway. This is easily accounted for by the fact that the forces of nature have no real significance except for life, and life has no meaning except for mind. Everybody is dominantly interested in himself and the working of his mental powers. He cannot long be diverted from this study when once he has developed far enough to pursue it. No sooner has he found out a little about the world

around him than he becomes anxious to know what he can of the world within.

The author's indebtedness to the work of others is so great that it is impossible here to make individual acknowledgements. He has tried to do so as far as possible in the text.

F. S. H.

UNION COLLEGE, March, 1903.

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PSYCHOLOGY AND COMMON LIFE

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CHAPTER I

THE BRAIN AND ITS RELATION TO INTELLIGENCE

STUDENTS of anatomy and physiology tell us that the human body long ago reached the climax of its powers. Nearly all of its organs, they assert, have already undergone a marked degeneration. Over seventy of them, at least, have so far atrophied by centuries of disuse as to be no longer of any known service.

Every one is familiar with the fact that the sense of smell in a dog or cat is far more highly developed than in a human being; but few realise to what extent this sense has lost its power in the civilised man of to-day as compared with a savage. The Arabs of the Sahara desert, it is said, can smell a fire thirty or forty miles distant. But this sense in the civilised man of Europe and America is now so weak and uncertain that he rarely places any reliance upon it in determining upon a course of action.

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In spite of all the ear of man has been able to do in the past there is abundant reason for holding that it is fast becoming what another describes as, at its best, "a squat and degenerate member." Whenever we want, for any reason, to enlarge our capacity for hearing we no longer try to develop the ear to the required efficiency, but at once resort to some mechanical contrivance for supplementing its waning power.

Much has been written in the past, and justly, about the marvellous construction and exquisite adaptation to its end of the human eye. But the sad fact is that many of the lower animals can now see much farther and more accurately than any man. Distorted and short-sighted eyes are the rule rather than the exception among many, if not all, highly civilised nations.

Even the hand of man is fast being relegated to a far more subordinate position in the human system than it once occupied. Its degeneracy began when human beings first commenced to use tools. And when they compelled steam and electricity to make the tools do their work, the possible degeneracy of the hand knew almost no limit.

But the greatest decline of all is in human muscle. Professor Drummond puts it none too strongly when he says (*Ascent of Man*, p. 107): "For mere muscle, that on which his whole life once depended, man has now almost no use. Agility, nimbleness, strength, once a stern necessity, are either a luxury or a pastime."

But why is it that with all this degeneracy of his

bodily powers man can keep up unceasingly such a vigorous battle for existence on this planet? How can he make such rapid strides from generation to generation in subduing the earth and gaining dominion over it?

The reason is that there is one organ in the body that is not degenerating, an organ that, so far from showing any diminution of its power, has never developed at such a rapid rate as at present, and to whose future development it is not within the power of man to set any conceivable limit. This organ is the brain, and it is just because the brain is assuming more and more the absolute control of the body and making it subservient to its purposes that all the other organs are sinking into the background. The truth is that the brain is fast taking away their occupation. It is all the time devising new and better ways for doing the work that they once did acceptably, but cannot do acceptably any longer.

It is not in size or weight, however, that the brain is making such marvellous advances, but in complexity. In respect to volume it has already attained its appointed limit. Professor Cleland (*Journal of Anatomy*, vol. xxiii., p. 360 *seq.*) has fully demonstrated that the cranium of man long ago reached the climax of its development. And this fact, from the nature of the case, puts a limit upon the quantity of brain substance that can be stowed away within it. The absolute amount of brain-matter in different skulls is, of course, not always the same. The average weight for an adult male among civilised

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peoples is about 50 ounces, and for a female 44 ounces. Many human brains rise far above this average and many also fall far below it. It is said that the brain of Lord Byron weighed 79 ounces and that of Cromwell 78 ounces. These are probably overestimates. For we have no evidence that they were made with any scientific accuracy, either as to time or manner. Daniel Webster, whose head was likened by Sydney Smith to the dome of a cathedral, had a brain that weighed 53.5 ounces. Agassiz's brain weighed 53.4 ounces, and Chalmers's 53 ounces.

But a great head is no conclusive proof of great intelligence. For many idiots have abnormally large heads. An idiotic boy fourteen years of age is reported whose brain-weight was 60 ounces. In spite of all the attention that has been paid to the subject it is still a disputed question whether idiots have larger or smaller brains than people of average mental powers. Probably the results of recent investigation of the subject do not alter materially the statement made long ago by Dr. Ireland in his work on idiocy, that "three fifths of idiots have larger heads than men of ordinary intelligence." It is admitted by all, however, that the position taken by Dr. Calderwood, in his work on *The Relation of Mind and Brain*, is a correct one, that "below 30 ounces in weight [of brain], or below 17 inches in circumference of cranium, uniformly implies imbecility."

There are only about thirty cases of remarkably small brains on record, twenty being males and ten

females. One of the most wonderful of them all is the case of an Italian woman by the name of Grandoni, who was born in 1830 and died in 1872. A careful record of her case was kept by Professor Cardona and a microscopic examination of her brain was made by Dr. Severini of Perugia. The weight of her brain was a little over 9 ounces—probably the lightest-headed adult of whose doings we have any knowledge. Grandoni learned to walk and to talk not much later than other children. She had good sight and hearing and could answer simple questions. She usually smiled when she saw others smiling, but was never known to laugh at a joke. She was very fond of amorous poetry and showed decided erotic tendencies. As she grew older she took to a wandering life and became so extremely fond of dancing that she spent much of her time whirling about in grotesque movements to her own singing. Her brain when examined was found to be chiefly deficient in the posterior parts, the frontal region being fairly well developed. Grandoni's case cannot be regarded as an ordinary example of microcephaly or small-headedness, for her intelligence was decidedly exceptional for one of this class.

- Cioccio, another Italian woman whose case has been somewhat carefully studied, had a brain-weight of about 10 ounces. She was deaf and dumb and extremely stupid. Bischoff, who describes the case of another microcephale by the name of Helene Becker, says of her that she had so slight a degree of intelligence that "she knew her own name, but otherwise paid little attention to what people said to her. She

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could only speak one word, but used two sounds." The woman reported by Mr. Gore as having a brain-weight of 10 ounces and 5 grains "could only say a few words, such as good, child, mama, morning, with tolerable distinctness, but without connection or clear meaning, and was quite incapable of anything like conversation." These and other similar cases clearly establish the position taken above, that below 30 ounces of brain-weight or below 17 inches of circumference of cranium uniformly implies imbecility.

It is a fact, however, that many people whose brains are far below the average in size and weight pass through life without attracting any special attention for ignorance or stupidity. It has often been shown that persons who have occupied quite respectable positions in society were as deficient in brains as well-known idiots. They lived such prosaic lives, their thoughts ran in such narrow channels, day after day going over the same hackneyed themes, that no occasion offered itself for showing how stupid they actually were. Very few brain cells will enable most people to meet the requirements of their ordinary tasks. As Dr. J. Crichton Browne remarks: "It is astonishing how little real thinking will suffice to carry a well trained man through an average day or month of an average life."

Let some variation in the usual routine of duties be attempted and most people are very quickly thrown into mental chaos, either because the brain substance necessary to meet the emergency is en-

tirely wanting, or because the portion of the brain that ought to be in readiness for action has already atrophied through long disuse.

It must be acknowledged, however, that great injury may be done to certain portions of the brain without a fully corresponding injury to the mental powers. In *Science* for April, 1885, the case of a man was described who had been shot by a bullet that went entirely through the head, starting at the middle of the forehead. A tube was introduced following the course of the bullet of such a material as would allow the refuse matter to exude. In two weeks the man was about his usual business apparently as well as ever. The only decidedly noticeable mental loss was a weakened memory. Dr. Bateman, in his work on aphasia, tells us that in the year 1825 two officers, quartered at Tours, as the result of a quarrel fought a duel in which one of them was shot by a ball that entered at one temple and made its exit at the other. "The patient survived six months," he says, "without any sign of paralysis or of lesion of articulation, nor was there the least hesitation in the expression of his thoughts." At his death it was found that the ball had traversed the two frontal lobes at their centre.

Perhaps the most striking case of injury to the brain on record is that now widely known as "the American Crowbar Case." The skull of the man in question is preserved in the Medical Museum of Harvard University. The case was first described by Dr. Bigelow of Quincy, Mass., at the time of the accident, but as Dr. Ferrier, in his *Localisation of*

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Cerebral Diseases, gives a more condensed account of it, we quote from him :

“The subject of the lesion was a young man, Phineas P. Gage, aged twenty-five. While he was engaged tamping a blast charge in a rock with a pointed iron bar 3 feet 7 inches in length, $1\frac{1}{4}$ inches in diameter, and weighing $13\frac{1}{4}$ pounds, the charge suddenly exploded. The iron bar, propelled 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 a 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 and a half years afterwards. Unfortunately, he died (of epileptic convulsions) at a distance from medical supervision, and no post-mortem examination of the brain was made; but, through the exertions of Dr. Harlow (of Woburn), the skull was exhumed and preserved. Upon this the exact seat of the lesion can be determined.”

Some have quoted this case as showing that no permanent physical or mental injury resulted to Mr. Gage from this experience. But the facts are quite the opposite. Dr. Harlow, who made a careful study of the case, describes his mental condition as follows :

“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 could not give him his place again. The equilibrium or balance, so to speak, between his intellectual faculties and animal propensities, seems to have been destroyed. He is fitful, irreverent, indulging at times in the grossest profanity (which was not previously 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 animal 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.' "

Here we need also to note another set of facts that go to show that it is possible for a person to be an idiot from having too many brains for his skull as truly as from having too few. In the one case he is literally suffering from "big head," in the other he is properly described as "rattle-brained." The relation of the mass of the brain to the cavity of the skull in which it is stored is, in the normal condition, so exact that any increase in the substance of the brain due to an excessive flow of blood to the brain or to the formation of a tumor, may cause the outer

portion of the brain to press against the hard walls of the cavity in such a way as to induce a congestion of the whole organ.

Dr. James Sidney, of Edinburgh, tells us of a case he attended which is in point (quoted from Carpenter). The patient, he says,

“was struck by a revolving crane handle on the upper part of the left parietal bone, producing a compound comminuted fracture, with a protrusion of the brain as large as a bantam’s egg. After admission to the hospital the case did well; about ten or twelve small pieces of bone were removed, the protruding brain sloughed off, the wound healed over, and the man was discharged about six weeks after admission without having shown any bad symptoms or taken one single dose of medicine during his stay. Previous to admission he was misanthropic, lived in a hut alone, washed his own clothes, cooked his own food, and seemed peculiar in many ways. A month after his dismissal from the hospital he married and ever afterwards conducted himself as a most respectable member of society, showing none of his former peculiarities.”

Dr. Allen Starr, Professor of Nervous Diseases in the College of Physicians and Surgeons, in New York, recently reported a case of special interest in this regard that had come within his own practice. A lad about fourteen years of age, belonging to a good family and of excellent disposition and habits, suddenly developed such a violent temper that the slightest rebuff would throw him into an uncontrollable passion. At times he became so profane in his

language and so abusive of all with whom he came in contact that nothing but physical force would keep him within reasonable limits. After all hope of his improvement by ordinary means had been abandoned by his parents Dr. Starr was allowed to experiment upon him in any way he saw fit. He had kept a careful record of the boy for some months and was confident that an abnormal condition of a certain portion of the brain which he located was the chief cause of his trouble. He called in two of his fellow-professors, who were skilled surgeons, and had them trepan the skull and probe for the diseased spot. They found it at once and removed a knotted portion of the brain substance about the size of a large walnut. In a few days the boy was in his normal condition again and has since shown no indication of departing from it.

In the *Medical Record* for November 21, 1885, Dr. Carlos F. MacDonald, of Cayuga County, State of New York, gives an account of another interesting case in this relation that deserves mention. A man in one of the families where he was physician, as the result of an injury received while out hunting, quite suddenly became a raving maniac. After a careful study of the matter he decided that the chief trouble was in the frontal region of the brain. He introduced a hypodermic needle in such a way as to reach the diseased spot. A cyst was found there on the evacuation of which the patient was entirely restored to his normal health both of mind and body.

A case has recently been reported from Chicago

of a young girl who had the use of her eyes and limbs completely restored to her after being two years totally blind and a paralytic by the removal of a comparatively slight foreign substance from a tract in the brain.

It is quite possible for a person to be deprived by disease or accident of such external organs as the eye and ear and still have a normal brain and even more than ordinary mental power. The famous case of Laura Bridgman is here in point. Professor Henry H. Donaldson, of Clarke University, has very fully described her case in two articles, entitled "Anatomical Observations on the Brain and Several Sense-organs of the Blind Deaf-mute, Laura Dewey Bridgman," published in the *American Journal of Psychology*, September, 1890, and December, 1891. Laura Bridgman was born December 21, 1829. When about two years of age she had a severe attack of scarlet fever which resulted in the suppuration of both eyes and both ears, and the almost total loss of taste and smell. In 1837, when nearly eight years of age, she was brought to the Perkins Institute for the Blind in South Boston, Mass. Dr. Howe, the Director of the Institution, devoted many months, and even years, of his time to her education. Her sense of touch became so acute that Dickens says that she recognised his brother after two years' absence simply by feeling of his hand. It was through this sense that she received and made known all her sensations and thoughts. In the course of her lifetime she became the author of a journal, three autobiographical sketches, and sev-

eral poems, all of which show more than the average power of thought. She died at the Institute in her sixtieth year, retaining to the last the normal use of her mental powers. Her brain was secured by President G. Stanley Hall and thoroughly studied by Professor Donaldson. No especial defects were found in it that would not naturally result from the disuse for a lifetime of most of her senses.

The case of Helen Keller is another example of the same sort. She has been deprived of sight, hearing, taste, and smell since her eighth year. In 1900, when about nineteen years of age, she passed the entrance examinations for Harvard, and is now a member of the junior class in Radcliffe College. At the lectures she is invariably accompanied by Miss Sullivan, who sits beside her and gives her in the manual language whatever the instructor may be saying. Her examination papers are in the raised-point system, and her answers she writes upon a typewriter, in the use of which she is an expert. It is altogether likely that her brain, if ever examined anatomically, will be found to be as healthy and normal as that of Laura Bridgman.

It is probable that many other blind deaf-mutes are not defective in brain substance any more than in the two cases referred to above. They are cut off from most of the knowledge of the external world possessed by the ordinary individual simply because of defective external organs. But it is possible for persons who have perfect external eyes and ears to be blind and deaf as well as for persons who have no eyes and ears at all. For all hearing and

seeing take place in the little nuclei of cells in the brain that are devoted to these ends. If they are wanting there will be no sight or hearing, however well developed the external organs may be. And if they are in good working condition some action within the brain itself may throw them into the same condition they would be in if actually affected by some outside object. If this happens the person will, to some extent, see and hear, even though the external organs are entirely wanting or have no chance to act at all.

The brain centres may easily be put into an abnormal condition by certain drugs and intoxicating drinks. The opium and hasheesh eater as well as the drunkard see and hear in their deliriums just as truly as they do in real life. In just the same way we actually make our mouths water at the thought of a delicious peach or shiver all over at the recollection of a disagreeable experience with an icicle.

As is well known, the brain is divided by anatomists into three principal parts, called, respectively, the cerebrum, the cerebellum, and the medulla oblongata. The cerebrum in the lowest vertebrates is very insignificant in size and importance as compared with the other parts of the brain, but in man it occupies four fifths of the entire cranium and is now almost universally regarded as the seat of all the mental powers. If this is removed the functions essential to the maintenance of life, such as breathing, eating, digestion, and the like, may all go on uninterrupted, for they are attended to by the medulla oblongata. But there will be no intellect-

ual guidance or volitional control. If, on the other hand, the cerebellum be extirpated, consciousness will still continue and there will be no radical disturbance of the mental powers. These experiments of cutting out the cerebrum and cerebellum and noting the effects have often been performed upon dogs and other animals, and many persons are doubtless in existence minus a large portion of one or the other. The cerebrum is divided into two hemispheres, both of which are connected with the activities of the mind. If one is impaired or destroyed its work is done, in part at least, by the other. It is an interesting fact, however, for which there seems to be no adequate explanation, that intelligence in right-handed individuals resides chiefly in the left hemisphere of the brain and in left-handed people in the right hemisphere.

Each hemisphere of the cerebrum is divided by fissures into five principal lobes, called the frontal, the temporal, the central, the parietal, and the occipital. The fissure of Sylvius is between the frontal and temporal lobes and the fissure of Rolando begins near the fissure of Sylvius and extends upwards to the central lobe. It is around these two fissures that intelligence largely centres, and the mental ability of an individual is best measured, other things being equal, by the depth of these fissures. For the surface of each hemisphere is by no means a plain one, but consists of a complicated series of convolutions and intervening fissures. By this arrangement a greatly increased superficial area is secured without an increase in volume. The

intelligence of which any being is capable depends upon the extent of this superficial area,—hence upon the depth of the fissures between the constituent parts.

A closer examination of these hemispheres reveals the fact that the entire inner portion is a mass of white matter consisting of nerve fibres, and the tissues in which they are imbedded, called by Virchow nerve glue, while the outer covering is grey and made up of a vast number of microscopic cells, or neurons, varying greatly in size, shape, and general appearance. It is in this outer covering, called the cortex of the brain, that the nerves running to all parts of the body terminate. Here it is that intelligence resides. Here the mind makes its connection with the body, and, by the influence it exerts upon these cells, carries out its plans and purposes. “It is easy to distinguish in the cortex of the brain,” says Professor Starr in his recent work entitled *Atlas of Nerve Cells*, “the four types of cells—viz.: Cayal cells, small pyramidal cells, large pyramidal cells, and polygonal cells. But the relative number of these cells varies greatly in different regions of the brain and their arrangement in layers also varies.” “It is yet impossible,” he adds, “to assign any separate functions to the various kinds of cells” (p. 78).

If spread out horizontally the cortex of the brain would occupy a space about 12 inches in length, 11 inches in width, and 1 inch in depth. And the cells of which it is composed vary in diameter from $\frac{1}{300}$ to $\frac{1}{3000}$ of an inch. It was estimated by Meynert

that there are 612 millions of nerve cells in the tops of the convolutions of the cerebral cortex, and that there are 1200 millions in the entire cerebral cortex. But a recent issue of the *British Medical Journal*, London, summarising the work of some more careful calculators, says: "The present estimate gives the astounding result that there are over 9200 millions of nerve cells in the cerebral cortex, an estimate about eight times as large as that published by Meynert in 1872." It is probable that each one of these cells keeps a record of everything that happens to it; and also contains a record of all that happened to the mother cell from which it was generated. Professor Ladd explains the fact that cool, slimy objects usually give us an unpleasant sensation as due to ancestral experiences recorded in our brains. There is nothing irrational in this and similar suppositions when we recall the fact that the microscopic germ from which we are all developed contained in itself all the organic characteristics of our ancestors, even to the colour of the hair and eyes, the shape of the nose, and the curve of the finger nails.

It is now generally conceded that these cells in the cortex of the brain are arranged together into certain groups called centres, and that the mind uses these centres in controlling the body and elaborating its thoughts. Some of these centres have already been located with more or less exactness. The seeing centre is in the occipital lobe in the rear of the brain. The power of vision depends chiefly upon the development of this centre, and if it is deranged in any way the sight will be abnormal.

If its connection with the optic nerve is severed nothing whatever can be seen by the external eye, however perfect that organ may be; and any commotion in this centre may result in a sensation of sight, even where the eye, commonly so called, is wanting altogether.

The hearing centre is in the temporal lobe, and we may hear sounds through the agitation of this centre without the use of the external ear just as in the case of the eye. The smell and taste centres seem to be very closely associated and are not far from the hearing centre. The speech centre, or area, called Broca's convolution, is in the left hemisphere only and the posterior portion of the frontal lobe. It is impossible to speak until this area is duly developed and its different parts are properly connected. The movements of the limbs and face are chiefly controlled by the area about the fissure of Rolando. The application of an electrode to these portions of the brain may cause a movement of these organs without any attempt of the mind to produce it or even in spite of an attempt to prevent it. When these portions of the brain are extirpated ability to move the parts in question disappears.

Much attention is now being paid to what are called the concept centres of the brain. These are centres that must be developed before a person can form a general notion, such as "dog," "boy," "man," or do any reasoning, strictly so called. That these centres are located in the frontal lobes of the brain seems now to be generally admitted. Bianchi, a great experimenter upon animals, found

that after he had extirpated the frontal lobes of some dogs and monkeys their curiosity was gone. They remained affectionate and impressionable, but lost all power of concentration. From a great variety of cases he concluded 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. . . . Removal of the frontal lobes does not so much interfere with the perceptions, taken singly, as it does disaggregate the personality, and incapacitate for putting together groups of representations."

Ferrier met with the same results in his experiments. He found 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."

Professor Allen Starr describes his own recent investigations on this subject as follows:

"The brain of man differs from that of the lower animals and of idiots chiefly in the greater development of the frontal lobes. It seems probable, therefore, that the processes involved in judgment and reason have as their physiological basis the frontal lobes. If so, the total destruction of these lobes would reduce man to the grade of an idiot. Their partial destruction would be manifested by error 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

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to fix the attention, to follow a continuous train of thought, or to conduct intellectual processes. It is this very symptom which was present in one half of the cases here cited. It occurred in all forms of lesion; from injury by foreign bodies, from destruction by abscess, from compression and softening due to the presence 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 here cited."

Many other independent and unprejudiced investigators, such as Richet, Grassel, Hitzig, and Golz, have come to the same conclusion, thus confirming the popular notion and the view of the ancient Greeks, that high, broad, and prominent frontal lobes indicate intellectual power. Post-mortem examination shows that idiocy is generally due to special defects in these lobes of the brain and that senile dementia and general paralysis are to be traced to their atrophy.

What happens when these centres for any reason cease to perform their appropriate functions is well expressed by Professor Barker of Johns Hopkins University, a well-known expert on pathology, in these words:

"When the intellectual centres are paralysed, there often results most remarkable 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."

The importance of a free circulation of blood through the brain in order that it may properly perform its functions should here be noticed. It has been estimated that while the weight of the brain is about one forty-fifth of the body, the amount of blood it requires is about one eighth or one ninth of the entire supply of the body. Impurities in the blood, introduced by drugs or otherwise, may very quickly and disastrously affect the whole mental life. On the other hand, a moderate stimulation of the circulation may greatly quicken the train of thought.

It is also well established that any change in the psychical states is closely connected with the rise and fall of temperature in the substance of the brain. Not only does the receiving of sensory impressions produce a rise of temperature in the hemispheres, but any psychical activity develops some degree of heat in addition. Strong impressions are usually accompanied by alternations in the rise and fall of the temperature. These alternations take place over the entire area of the hemispheres, but in the different local areas they vary in speed and amount of increase, being most noticeable in the occipital area. The variations in temperature are greater and more rapid when the emotions are active than when the brain is performing some purely intellectual work.

That these changes in the temperature are not due merely to changes in the arterial circulation is seen in the fact that they do not correspond to changes in the respiration, but are quite independent

of them. They are accounted for only on the assumption that psychical activity uses up nerve tissue, and this is confirmed by the fact that a waste of brain substance accompanies all mental work. Let the quantity of sulphates and phosphates that enters into the diet be carefully estimated and it will always be found that the quantity excreted when any mental work has been performed will be noticeably increased. The constituent elements of the brain must have been disorganised to make up for the difference.

If the human brain is such a marvellously complex organ as its anatomy teaches—the most complex that has ever been constructed or can be thought—and if it can be accepted as an established fact that there is no known mental action that is not accompanied by brain action, the question naturally arises can we do anything to unfold the latent resources of the brain, or to control its activities after they are once developed. And we answer unhesitatingly, much every way. If we can give skill to the hand or increased accuracy to the eye much more can we develop and train the powers of the brain, provided we begin at the proper time and proceed in a rational manner. It may be laid down as a general truth that, as with all the other organs of the body, the size and efficiency of the various centres of the brain vary with their use. Dr. Jacobi, of New York, in the *American Journal of Psychology* (November, 1888), correctly argues that the early studies of a child should be chiefly selected from the effect they will have upon the development of the brain.

In general, it may be said that a child should first have its motor and sensory centres well developed before attempting much with its concept centres. In other words, it should first acquire an accurate use of the large muscles of the hand, the eye, and the other sense organs before it should be taught to sew, or read, or write. Its early years should be chiefly spent in gaining a knowledge of external facts through observation, listening to the living teacher, and not through books. Later, when the concept centres are developing, it can best begin to reason about those facts. Then Latin can well be taken up. For it is the most logically constructed of all the languages and will help more effectually than any other study to strengthen the brain centres that must be used where any reasoning is required.

If the brain centres are not developed early in life they never will be. It is for this reason that it is so difficult for persons of middle age to acquire the easy use of a foreign language. The language centres, as a rule, early take on their permanent character or become atrophied to such a degree as to be beyond all possible recuperation. It has often been shown that it is physically impossible for a person to take a course of study at thirty that could have been mastered easily at seventeen. *How about Dh. 11.5*

Here we may well note the power of habit. All habits are, in a peculiar sense, matters of the brain. They may properly be regarded as the ways in which the brain cells have come to act under a given stimulus. At the outset we have much to do in determining these ways, but when they are once estab-

lished it is hard to change them, and in many cases practically impossible. All habits when once firmly established may as truly be said to have us as we to have them. There is a profound truth in the saying that every man is a bundle of habits. It is to this physical basis of habit that Professor Ladd reverts in attempting to explain why it is that most adults are so averse to a new idea. It is maintained by some that nobody really admits a new idea into his head after his twenty-fifth year. The truth in this opinion is that our brain cells get to work in pretty definite ruts by that period, and it can then be determined with considerable accuracy what limitations they are going to impose upon our future development.

In spite of all this, it is impossible to imagine an instrument that is so susceptible in its early development to outside influences as the human brain. There are probably innumerable impressions being made upon our brain cells every day to which, at the time, we pay little or no attention, though favourable circumstances may later bring them out into full consciousness. If we have any control at all over our environment we have a corresponding control over the kind of impressions we are constantly recording in our brain cells as the material for future thought.

No organ in the body is so susceptible to disease or misuse as the brain. Every excess of every sort injures it and every vice records itself upon the brain more indelibly by far than upon the face or upon the abused organ. It has already been pointed out

that imbecility is not so often due to lack of brain substance as to a diseased condition of the brain. Dr. Maudsley, in his work entitled *Body and Mind* (p. 44), goes so far as to say: "Idiocy is, indeed, a manufactured article; and though we are not always able to tell how it is manufactured, still its important causes are known and are within control." Many cases are distinctly traceable to parental intemperance and excess. Out of 300 idiots in Massachusetts, Dr. Howe found as many as 145 to be the offspring of intemperate parents; and there are numerous scattered observations which prove that chronic alcoholism in the parent may directly occasion idiocy in the child. Insanity is also due to a diseased condition of the cells of the brain. A crazy person is literally out of his head, out of the proper use and control of his brain and thus of his body. It is estimated that over half the insanity of the world is due to intemperance and licentiousness. The rest of it is chiefly, if not entirely, traceable to excesses of some sort. Any person may easily make himself insane by constantly losing his self-control or continuously pampering a vicious habit. To be drunk and to be crazy are one and the same thing. The brain cells are paralysed or stimulated beyond control. An intoxicated person is no more responsible for his actions than a runaway locomotive. It is possible, however, for a person who inherits a tendency to insanity to do much if he begins in time to check it or ward it off altogether. He must keep himself strenuously in such physical and social surroundings as will develop and solidify a normal and

healthy brain. Everything that is degrading or vicious in word or deed he must absolutely abjure.

We have every reason to suppose that the rule is universal that perverted thoughts and choices inevitably lead to a perverted brain and that right thoughts and choices tend to establish and maintain a well-ordered brain.

CHAPTER II

ATTENTION AS THE BASIS OF THE MENTAL LIFE

DARWIN, in his *Descent of Man*, when treating of the mental powers of monkeys, incidentally remarks that it is quite impossible to make anything out of a young monkey if his attention can easily be diverted. He might have added that the same thing is true of human beings. For the power to pay attention is the primary condition of all mental development, brute or human. The lack of this power is the sure sign of general paralysis or hopeless idiocy.

The failure to recognise the universal presence of attention in all forms of mental life is the fatal defect in the psychology of the associational school of writers from John Locke to Herbert Spencer. They leave out of consideration the most important of all the facts. For no amount of increase in the power to receive impressions from without will account for mental progress. It is precisely this active, all-pervasive energy of attention that makes any sort of development possible. The ignoring of it cannot be condoned or overlooked. For the very foundations of a scientific treatment of mental phenomena are undermined by so doing.

How fundamental attention is to our mental life is seen when we compare it with consciousness itself. Consciousness, according to our view, is not one of the faculties or powers of the mind for apprehending facts, but the sole condition of all our mental states. It distinguishes mind from not mind; where it is present in some degree there is mind. Its manifestation is probably not dependent upon any special physical basis, as is the case with the individual senses, but upon the sound and healthy condition of the sensorium as a whole. There is nothing else in the world like consciousness and therefore it cannot be defined. It is known only by being experienced, but it must be experienced before one can talk about such mental states as sensations, imaginings, thoughts, choices, and the like.

A clear distinction is to be made, however, between letting a mental state float along, as it were, in consciousness, and seizing hold of some one of its aspects for more definite consideration. This latter act is an act of attention. It is the mind detaining something in the stream of consciousness in order to examine it a little and see what use can be made of it. A mind that cannot do this may exist perhaps, but cannot progress. Simply being conscious of our mental states requires no perceptible expenditure of mental energy, but attention involves the definite outlay of force which must be constantly exerted if any mental development is to be acquired. Attention actually accompanies in some degree every mental process. As Ladd remarks: "What is ordinarily called inattention is not the negating of all

attention; it is rather diminished intensity of attention, or attention directed to other objects than those which seem proper under the circumstances." When I do not attend to the loud knock on my study door it is usually due to the fact that I am absorbed in reading a new book that has just come to me, or am preoccupied with a game I happen to be playing with one of the children, or because I am busy with the system of some old Greek philosopher whose exact place in the history of thought I am trying to locate.

As a matter of fact attention is identical with the power of concentration, and it is impossible for us to imagine a mind making any progress in intelligence without this power in some degree. Attention is the active side of consciousness, and the loss of attention would involve the loss of personal unity. For it is upon the continued consciousness of this power that the knowledge of ourselves as persons is based. Attention naturally divides itself into two kinds, forced and voluntary. A brilliant flash of lightning, a violent pain in the tooth, the shriek of a locomotive whistle, an intensely disagreeable odour, will attract the attention, even though we have willed not to be disturbed by them. They are all cases of forced or reflex attention. For the object controls our attention and turns us about whithersoever it pleases rather than we ourselves. This is the normal condition of very young children and of all adults whose wills have not developed with their years. Shortly after birth a child will pay attention to a very bright light, or a very loud noise, but several weeks

will pass before it shows the first signs of any ability to direct its own powers, and even after two or three years it will still be difficult for the child to turn its mental energy in any efficient way to anything else than the objects of its immediate environment. Those persons, young or old, who have little power of concentration are said to be easily distracted. That is, their attention is drawn hither and thither by every new external excitation with such rapidity that it falls to pieces in its endeavours to cleave continuously to any definite plan or purpose.

Here also we need to consider what are called fixed ideas. These arise when attention is so wedded to a single thought that all others that are not in complete accord with it are banished from consciousness: when an idea has once become fixed it forces all other ideas into association with itself. And if this state of affairs cannot be broken up by a change of scene, new surroundings, or new companionships, it gives a morbid tone to the whole life. This is the characteristic condition of every monomaniac. He is a monomaniac for this reason. It is also the condition of the hypnotic subject. He has lost all independent control of his physical or mental powers, and any suggestion from his hypnotiser becomes his dominant idea, everything is determined by it, and all his energy is devoted to putting it into realisation. His own will in the matter is entirely eliminated. He no longer tries to give direction to the current of his thought, but his attention having been fixed by another upon a certain idea, his whole intellectual activity is absorbed in it, and nothing

else in his experience except that which accords with this idea is allowed to influence his conduct. Only a new idea from his operator will change the object of his attention and thus the course of his thought.

Quite in contrast with this is voluntary attention. Here comes into consciousness a distinctly new element. For the first time in one's experience the power to direct the current of one's mental activities shows itself. Here is the first sign of the possession of a free will. What is ordinarily called abstraction or absent-mindedness is not a lack of voluntary attention, but such a concentration of it upon a certain line of thought as to make one oblivious to other matters. All the mental energy is directed into one channel and none is left to give to the sights and sounds that would otherwise attract attention. In most instances fixed or insistent ideas, as they are called, are the result of an overuse of voluntary attention. They come from brooding over them to such an extent that attention to them ceases to be voluntary. The power to withdraw the mind from absorption in them is lost, that is, voluntary attention has given way to attention that is fixed or forced. The power voluntarily to concentrate one's attention upon a given object or purpose is the beginning of all self-control and self-development. In fact, it is the power by which we first became aware of ourselves as real agents. Otherwise we would not be in a condition to know ourselves as the doer of our own deeds, or in any way capable of determining their character. It is this power of voluntary attention that Wundt calls *apperception*, and what

he is describing when he says: "Apperception is the one original act of will. It can exist without the consequences which follow upon other acts of will, whereas these always presuppose as their condition some internal act."

To what extent attention affects our mental life can best be shown by pointing out its connection with some of our primary mental operations, and first of all its relation to sensation. It is a well-known fact that attention directed to a sensation increases its intensity. It is also true that attention diverted from a sensation diminishes its intensity. Slight bruises and burns may become putrid sores by riveting the attention upon them, and excruciating pains may be dispelled by diverting the attention from them. Everybody knows that hot cloths relieve headache by compelling us to attend to a counter-irritation. The sole object of many medicines is to help the patient fix his attention upon some other portion of the body than the one affected and thus give the diseased part time to recuperate. The sufferer in a dentist's chair often finds the obnoxious tooth extracted before he is aware of it, the pain of the operation passing unnoticed because of the flutter of excitement attending it. Soldiers are not infrequently "riddled" with bullets without knowing it until the excitement of the battle is over or a bullet touches a vital spot. A similar experience is not uncommon with football players and persons engaged in other exciting sports. Paralysis has been cured, or at least driven to other parts of the body, by letting the attention become absorbed

in other affairs of a wholly different character. This has been found to be in many cases the best method of treating insomnia, dyspepsia, and other similar troubles. In nearly all nervous diseases attention plays a most important part. The wonders of hypnotism are almost wholly due to it. Professor Krafft-Ebing, of Vienna, tells us of a young woman whom he hypnotised and caused to fix her attention so completely upon a pair of scissors, or piece of glass, or any similar object placed against her skin as to produce a fully developed scar in the form of the applied object. He could also take away the scar by a similar process.

The time occupied by a sensation as well as the intensity is greatly affected by attention. Unless the impression on the sense organ is continued a certain length of time there will be no sensation at all. A lighted stick can easily be whirled around so rapidly as to appear like a circle of fire. Disks of several different forms and colours may be made to revolve so as to look like one white object, round and stationary. Writing on slates and many similar feats may be performed in our very presence so quickly as to be entirely beyond our notice. We generally wink our eyes so quickly as to make no change in the continuance of the sensation we are experiencing at the time the winking occurs. The explanation in all these cases is the fact that sufficient time is not given for the separate impressions to result in a sensation. The only sensation is that attending the impressions as a whole.

In all accurate scientific observations, especially in

astronomy and similar studies, much must be made of the fact that time is necessary for an impression to result in a sensation. This time greatly varies for different individuals and different conditions of the same individuals. But what especially concerns us here is the fact that this time can be greatly reduced by careful attention. Let the expectation of an impression be increased and the time will be diminished. Professor Baldwin, of Princeton, after considerable practice and about four hundred experiments upon himself, reduced what is called his simple reaction time to one eighth of a second. Allowing one half of the entire reaction time for the physiological part of the process, attention would lessen the time required for the psychical part of a sensation to about one fifteenth of a second.

Perception is also greatly affected by attention. What we perceive often depends upon what we expect to perceive. Dr. Tuke, in illustrating the power of a dominant idea, gives us the following incident :

“ During the conflagration at the Crystal Palace in the winter of 1866-7, when the animals were destroyed by fire, it was supposed that the chimpanzee had succeeded in escaping from his cage. Attracted to the roof, with this expectation in full force, men saw the unhappy animal holding on to it and writhing in agony to get astride one of the iron ribs. It need not be said that its struggles were watched by those below with breathless suspense, and, as the newspapers informed us, ‘with sickening dread.’ But there was no animal whatever there; and all this feeling was thrown away upon a tattered piece of

blind, so torn as to resemble to the eye of fancy the body, arms, and legs of an ape."

When Baron Reichenbach was performing so many wonders by means of so-called odylic force, Dr. Braid found that he could make his patients experience the same things by means of expectant attention alone. By putting them in a dark room and telling them that there was a magnet in a certain corner, they would see flames of fire issuing from it, even though there was no magnet there at all. That D. D. Home, the famous medium, floated out of one window and in at another is proved by two reliable witnesses, though another witness who was present saw nothing of the kind. Ventriloquists and conjurors deceive us by playing upon our power of attention quite as much as by their dexterity.

While it is quite possible for persons far above the average in their general abilities to be so carried away by some dominant idea, that is, by expectant attention, as to have their testimony regarding what they have witnessed utterly untrustworthy, it is still quite impossible to perceive with accuracy without attention playing a most important part. What Lewes calls preperception is often a very large part of the perception itself. The anticipatory looking for the things helps us to see it when it comes and keeps us from missing it altogether, even though we stand before it face to face. Most men have no eyes except for what they have been taught to see. As James expresses it: "Any one of us can notice a phenomenon after it has once been pointed out,

which not one in ten thousand could ever have discovered for himself. Even in poetry and the arts, some one has to come and tell us what aspects to single out, and what effects to admire, before our æsthetic nature can 'dilate' to its full extent and never with the wrong emotion." And he adds: "The only things which we commonly see are those which we preperceive."

No one more fully recognised the fact that accurate perception is chiefly dependent upon attention than Agassiz. When a new student presented himself at his laboratory one morning he immediately pulled a fish out of a jar of alcohol and said to him: "You are to look at this fish carefully and tell me when I return how much you have seen. You must not cut it nor use any instrument upon it." In about ten minutes the student thought he was ready to report, but the professor would not listen to him until he had observed it for several hours. When he did report he only said to him: "You have not looked very carefully; keep on looking." He kept the student observing the fish and making drawings of it for three days. Years after the student said: "This was the best zoölogical lesson I ever had,—a lesson whose influence has extended to the details of every subsequent study."

Just as the time required for a sensation is greatly affected by attention, so it is with a perception. Experiment shows that the time needed for a perception can be reduced by concentrating the attention upon the thing to be perceived. A good practical example of how much attention can develop

quickness of perception is given in the well-known case of the celebrated conjuror Robert Houdin. He and his son were famous for a trick which they called second sight. They trained themselves by practising at first upon dominoes to tell at a glance without counting the sum of the points on as many as twelve at a time. They then drilled themselves in passing quickly through furnished rooms and in front of show windows and noting the articles that came within their range of vision. They once gave an entertainment in a private house in Paris that they had never before visited and astonished the entire company by telling with accuracy the position of the objects in an adjoining room, even to the books in the bookcases and their titles. They afterwards acknowledged that they had passed quickly through the room while the guests were assembling.

We come next to note the effect of attention upon memory. It has long been a fundamental dictum in psychology that memory is in proportion to attention. Little attention implies a weak memory and much attention a strong memory. The reason for this is that the capacity to retain mental pictures depends upon the intensity of the original presentation and the clearness of its relations; and both intensity and clearness are vitally affected by attention. Almost everybody has a good memory for some one set of facts. A merchant has little difficulty in remembering the price of his goods. A broker easily recalls the ups and downs of at least his own particular stocks. What college boy interested in athletics, however dull he may be in his regular studies, has

any difficulty in rattling off all sorts of sporting statistics for years back? Great scholars and philosophers, though often deficient in remembering ordinary events, easily treasure up a great mass of facts bearing on their own lines of study. The explanation in all these cases is that they remember what they attend to, and they attend to whatever fits in with their particular spheres of thought. The new facts admitted into their system are retained by the combined suggestive power of all the other similar facts already there. The facts that do not fit into their theory or general view of things, they pay little attention to and easily forget. Thus it is possible and not uncommon for a person to become a walking encyclopedia regarding one set of facts and an ignoramus concerning another, both coming alike within the sphere of his possible experience.

✓ Almost everybody knows to his sorrow that what is acquired during a few hours of intense application to be immediately reeled off in a final ordeal, as in cramming for an examination, cannot be a permanent possession. The trouble is that sufficient time is not given for the formation of clear and lasting associations. The brain processes in the operation are too rapid and superficial to allow of numerous or strong attachments to be made with other brain processes; whereas, if the same material were acquired gradually, considered in various relations, and repeatedly reflected upon, speedy oblivion would not be its inevitable fate.

In a general way it may be said that one's power of retention is fixed by his physical organism.

Within certain limits, due to changes in the health, age, and the like, it cannot be increased or diminished. It is chiefly the direction of this power and not its quantity that is subject in some degree to our control. Hence the improvement of the memory depends upon the number and tenacity of the relations established between the things to be remembered. Attention must be devoted to the elaboration of these relations if we wish to have a good memory. The only way in which one can strengthen his memory is by devising better schemes for holding the attention, which is the same as saying that improved remembering implies improved thinking.

And this leads us to a more definite consideration of the relation of attention to thought. By thought we here mean the putting together of what we have perceived and remembered into general notions or ideas and reasoning about those ideas. After all, what we have gathered up in the past will be of little value to us unless it can be treated in this manner. The world's great men have been those who have possessed great powers of continuous thought. They could so concentrate their mental energy, that is, so fix their attention upon the relation of things, that they could discover the general in the great mass of particulars and point out its bearings upon other fields of knowledge.

It is said of Archimedes, the discoverer of the law of the lever, that he had so riveted his attention upon the course of reasoning in which he was engaged that he did not know that Syracuse was being stormed until he received his own death wound, and

that his only exclamation to the Roman soldiers as they forced their way into his apartments was: "Don't disturb my meditations." Sir Isaac Newton often forgot his dinner when absorbed in his calculations, and he sometimes sat all night on the edge of his bed wrapt in thought, even after he had undressed himself. Sir William Hamilton tells of an eminent thinker who had to be fed by his attendant during his periods of profound meditation. These cases give emphasis to the saying of Melancthon that "the attention of the intellect is a natural prayer by which we obtain the enlightenment of the reason."

Here we should note the effect of attention upon the time required to form a judgment and hence for drawing a conclusion from the judgments formed. Careful experiment shows us not only that the time for experiencing a sensation and the time for reproducing it by memory can be greatly lessened by increasing the attention, but that the same thing is true regarding judgments. The average of a great number of experiments reduces the time to about one second, though the time is a little longer if the subject of the judgment is abstract and a little shorter if the subject is concrete. This shows that a child should first be taught to fix its attention easily upon the formation of concrete judgments and processes long before attempting the abstract.

That the feelings as well as the intellectual powers are greatly affected by attention is a commonly observed fact. All pleasures and pains are greatly heightened by being attended to and lessened when

the attention is withdrawn. Almost any one can "work himself up" to a frenzy of passion over what in itself is a very insignificant matter if he concentrates his attention exclusively upon it. Our joys and our sorrows, our hopes and our fears are in this way largely what we make them. They can be increased or diminished almost at our option.

The feeling of interest which lies at the basis of so much of our mental life is especially related to attention. Some psychologists make the two almost identical. It certainly must be admitted that what interests us holds our attention, and that if we want to keep our attention upon a thing, we must create an interest in it by giving it our attention. But the fundamental truth is that interest is primarily the product of attention, not the reverse. If we continually give our attention to anything we will create an interest in it, and in a general way it may be said that interest is in proportion to attention. Yet nothing is more evident than that we give our attention much more easily to some things than to others. And the sad fact is that for many minds the things that are horrible and disgusting are far more interesting than those that are ennobling and refined.

"The same object," says another, "which is most repulsive on account of the character of the feeling it arouses, may be very attractive on account of its power to awaken interest and so to fixate attention. A group of children transfixed with interest in some terrifying spectacle, the novel reader unable to tear herself away from the harrowing tale, the historical narrative which is

read without weariness or note of passing time, because of the horrors with which it deals, are illustrations in place here."

It cannot be denied that many of the works of fiction that have in the past most fascinated mankind are chiefly detailed histories of crimes and owe their power to transfix the attention in large measure to that fact. Entire exception cannot be made in this regard even for such masterpieces of their sort as Hawthorne's *Scarlet Letter*, Milton's *Paradise Lost*, Dante's *Inferno*, or Shakespeare's *Hamlet* and *Macbeth*. Tragedy and comedy at their best treat of the wrongs and follies of men, and so long as human beings continue to give their attention so absorbingly to such phases of life, they will continue to hold a high place in the literature of the world. Still we can if we will turn our attention more and more into new channels. We can distribute it, as it were, over a wider area and create an interest in other matters. But the point here to be emphasised is that whether the interest awakened is in the pursuit of a science, the development of a philosophy, the construction of a work of art, or the introduction of rational ideas in religion, the intensity of the interest will primarily depend upon the attention they receive.

To what extent the objects to which we are capable of giving our attention are within our control will best be seen when we have duly considered the relation of attention to the will. If we take will in its broadest meaning of any form of mental act-

ivity, then of course will is present in all kinds of attention both forced and voluntary. In this sense of the term every being that has any psychic energy at all would be said to have a "will of its own." But we are here using will as indicating the power of man to make an intelligent, purposeful choice. Now, while it is true that the range of things to which we can give our attention is fixed by neural conditions, yet the amount of attention we can give a thing that has once caught our attention is largely a matter of our own free will. We may not be able to introduce absolutely new ideas into consciousness, but we can prolong the stay of some that do come there and drive out others and thus give them a chance to affect our action. We may not be able to hold them there but for a moment, yet that moment may seal our doom. It may turn the stream of our thoughts into a wholly new channel, giving rise to new emotions and revolutionising our lives.

Equally clear is it that the way to influence others and control the action of their wills is to concentrate their entire attention upon the course we wish them to pursue. The present method of advertising will illustrate this point. The principle is, advertise the article so extensively and keep it so constantly before the attention of the public that when any one wants something of the sort his mind will spontaneously turn to it, and he will almost automatically send in his order for it. Hence the motto with many business men is: "Wholesale advertising or none at all." How many people there are in all spheres of life who owe their prominence to the

knack they have of always keeping themselves talked about by the press and general public! Some lawyers acquire extraordinary power over juries by the skill with which they concentrate their attention upon some accidental circumstance in the case, and thus divert their minds from any consideration of its real merits.

The poets and prose writers of our day who hold that whatever is human is a proper subject for their pen, often debauch the taste and moral sense of the public with vivid descriptions of unrestrained animal passions. They ignore the fact that the prime function of the will is to withdraw the attention from such matters and fix it upon pure and ennobling themes. Because the will controls the imagination, "sets it going and keeps it going," through its control of the attention, it is responsible for what the imagination creates as well as for the habitual direction of our thoughts. Furthermore, it is because attention leads to deliberation that the will can make a choice; and as character is always the result of choice, attention is vitally related to the very highest product of the will.

Much has been written about the relation of genius and attention, and it is commonly supposed that geniuses excel other people because of an unusual power of sustained attention. But Professor James is probably correct in saying: "It is their genius making them attentive, not their attention making geniuses of them." A real genius is a genius at birth. In such a mind a subject seems to start up and grow almost without any effort, because it is

constantly beholding a flood of unusual relations that awaken new interest and stimulate to new endeavours. As a matter of fact, however, geniuses often develop very little voluntary attention. They do not need to, and the result is that they rarely accomplish any work that is in proportion to their powers. The men of moderate endowments who develop concentrated attention by dint of will are far more likely to excel them in all that pertains to good judgment, a sound character, and a useful life.

But the most important phase of our subject is its application to education. It has been well said that the education that develops the power of attention is the education par excellence. Without the habit of continuous attention all endeavours to cultivate the other powers will be of little avail. The training of the attention should begin at the earliest possible period. First let automatic attention be developed. Help the baby to hold the attractive object in its grasp, to press it to its lips, to pick it to pieces, if needs be, provided its interest in the operation does not flag. Stimulate the growing child to ask the question Why? of everything that excites its curiosity. Let not its power of concentration be ruined by a multitude of toys. Soon the need of a teacher will appear whose mission it is to help the child fix its voluntary attention upon objects that in themselves may have at first little or no attractive power. At the outset, however, pleasing things should first be studied and then the indifferent. The teacher should discover some way of

awakening interest by linking the present task with something in the child's past experience. The old and familiar will help to hold the new.

The matter of preperception comes in here with special force. Whatever arouses interest in the subject in advance will tend to make attention easy. Curiosity should be constantly appealed to so that the new thing may seem to fit in so far as possible with a previous expectation.

No topic should be pursued so long as to weary the attention. With young children the subjects of study should be numerous, recitations short, and recesses frequent. Attention in common with all the other mental powers rests on a physical basis. If the activity of the brain centres is impaired by too great a flow of blood to the brain or too little, by overwork or disease, the effect upon the attention is most disastrous. This impairment of the brain can easily happen. Hence in early life, that is, up to the twelfth or fourteenth year, it is better to err by having too short periods of study than too long. Many a child is punished for inattention when longer attention to the matter in hand is utterly beyond its power.

An appeal to the motives of hope and fear is under certain conditions of great help in developing attention. For this reason if for no other the use of positive rewards and commands is by no means to be ignored. Especially is this true during the transitional period between automatic and voluntary attention. Then the will is weak and needs an occasional tonic. Unusual motives may frequently be

employed at this period that later should be dispensed with altogether.

Children as well as adults vary greatly in their power of sustained attention. Some pass too quickly from object to object and need restraint, while others dwell longer upon the matter in hand than their own good or the subject requires. Hence it will often happen that the means used to develop a well-balanced power of attention in one person will not be successful with another. Each individual case, if possible, should have individual treatment. The parent as well as the teacher should carefully attend to the training of this power.

CHAPTER III

HOW AND WHAT WE REMEMBER

THE ancient Greeks, almost as far back as we can trace their history, were accustomed to speak of memory as the Mother of the Muses. This was not an accident on their part, but a proof of their remarkable intellectual insight. If they had lived in our day they would have seen little or no reason for changing their view of the matter. For modern scientific research shows us beyond question that even the simplest operations of the mind require the constant presence and aid of memory. No perception of external objects can be made without it and no association of one idea with another is possible until memory has first of all performed its appropriate task.

When we say that we see an apple we actually experience at the moment only the single sensation of sight. But what we do when we make such an assertion is to put along with this sensation many other remembered sensations, such as those of taste and smell and touch. Otherwise we should not have data enough to make any assertion at all about the matter. What is true of perception is true of every other mental process. If memory did not bring

forth the material out of its storehouse there would be no knowledge of the past, no appreciation of the present, no anticipation of what is to come. We may even go so far as to assert that if we could not remember we should not know enough to know that we exist.

Hence the Greek idea that there would be no poetry, no art, no science, without memory is a perfectly rational one; and it is not difficult to see that man would revert without it into a condition below that of the wildest savage or even the most insignificant of brutes. If all memory of every sort should be lost even our most fundamental instincts would also perish. For they are nothing less than the stored-up memories of the doings of our ancestors reaching far back into the prehistoric past.

The earliest investigators who sought to account for memory thought it was due to the distribution of air in our bodies. When it was evenly distributed they said we remember; and when unevenly, we forget. Later Plato, while not really attempting to explain memory, represented Socrates as saying in the *Theatetus*:

“There exists in the mind of man a block of wax, which is of different sizes in different men; harder, moister, and having more or less of purity in one than another; and in some of an intermediate quality. . . . When we wish to remember anything which we have seen or heard or thought in our minds, we hold the wax to the perceptions and thoughts, and in that receive the impression of them as from the seal of a ring.”

In accordance with his doctrine of the pre-existence of the soul Plato maintained that all knowledge is remembrance. It consists in calling back again into consciousness what was once fully known in a pre-existent state. Memory is thus, in his view, the most important power of the soul and partakes of its eternal essence.

Aristotle was the first writer to treat the matter of the memory scientifically and this he did in a tract devoted especially to the subject. He thought that perception was due to a movement in a sense organ transmitted by means of the pneuma in the blood to the heart and that this movement continued after the stimulus that occasioned it had ceased to act. Thus arose after-images and it was these after-images that constituted the elements of memory. Only those things could be remembered that implied the formation of these images. In accord with this view he formulated his famous doctrine of the association of images or ideas,—namely, by contiguity in time and space, by similarity, and by contrast. He thought memory did not belong to the immortal part of our nature, but to what he called the passive intellect and perished with the body. Only a few animals in his opinion had a memory and none of them possessed the power of associating ideas.

Emerson says somewhere that all men are naturally divided into Platonists and Aristotelians. This is substantially true at least of students of the subject of memory. For most of the great writers on the subject since their day have regarded memory either as a purely mental power, limited at present

perhaps by the body, but not dependent upon it and immortal by its very essence, or as a power inseparably connected with the body, all the images of memory being merely the relics of former sensations, and being due to physiological processes, weaker it is true, but not otherwise essentially different from those experienced when the objects were originally perceived. On the one side we have St. Augustine, Leibnitz, Kant, and the German idealists, including also for substance of doctrine the entire Scottish school. On the other should be put Thomas Aquinas, Hobbes, Locke, Condillac, Bonnet, Herbart, Mill, Alexander Bain, and Herbert Spencer.

In our day it has come to be universally recognised by scientific observers that an act of memory is not a simple act, but on the contrary decidedly complex. All admit that fully to remember a past experience is just as complicated an act as the original experience itself. In fact, it is doing over again just the same thing that was done when we first had the experience. The only difference in the two acts is a difference in degree. When I call up in memory the orange I ate last week, I see it over again, I feel it over again, I taste it over again, and do many things over again with reference to it just as really as I did in my first experience with it.

A completed act of memory involves at least three things, and the first of these is retention. It used to be held that images of things once experienced are stored away in the pigeon-holes of the soul and that when we recall anything we simply bring one of these images out into view. But it is now known that the

mind does not have any such pigeon-holes. When we speak of memory as a repository or storehouse of past acquisitions, meaning by it that ideas or images of things are treasured up in it, we are talking about a fiction of the imagination, not a veritable matter of fact. That there is any retention at all connected with memory is purely a matter of inference. We have no conscious knowledge of the fact.

That retention is physical is now established beyond all reasonable doubt by a great variety of facts. The first great experimenter on this subject was Hermann Munk, Professor of Physiology in the University of Berlin. He published the result of his investigation in 1881. Among the things he did to prove that retention is physical was to take a dog and cut out the entire posterior portion of his brain. He found the dog was totally unable to see anything and had lost all memory of everything he had seen. He was still able to run about and to hear and smell and taste as well as ever. Then he took another dog and cut out only a certain portion of this posterior part of the brain. In a few days after the wound was healed, the dog jumped over any obstacle placed in his way just as before, and used his sense of smell and taste and hearing as usual, but he could not recognise other dogs he had known before, or his own puppies, or even his own master. He would not go to the places where he was accustomed to be fed, however hungry he might be; and when water was put before him to drink, he would not recognise that it was water or drink it till his nose was held into it. The whip, the sight of which

used to cause him to rush off into the corner in great alarm, had no more terrors for him. He had forgotten all about its use. As concerns the one sense of sight he was put back into the position of a new-born puppy. He ran up to objects and smelled of them and licked them just as he did when a puppy. After a long line of experiences he learned to go, just as a puppy learns to go, to certain places for food. By degrees he learned how to drink. Gradually he got acquainted with his master and came to dread the sight of the whip. In various ways he gathered together a new set of sight memories very similar to those he had before. In the first case the dog lost all sight memories and could never acquire any new ones. In the second case all old sight memories were gone, but the possibility of forming new memories was retained because all the area of the brain devoted to sight memories was not extirpated; a small ring of grey matter still remained in connection with the optic nerve, leaving room for future development.

Similar experiments have since been performed hundreds of times on other senses and on many kinds of animals. It has been found that if a certain area of the temporal region of the brain is injured sound memories are greatly affected and if the area is extirpated entirely all memory of sounds will be gone as well as all ability to perceive them. A dog treated in this way will pay no attention to the snap of his master's whip or his whistle, while at the same time he is in full possession of all his other powers. These experiments upon the temporal region of a

dog have been carried on with such exactness that all perception and memory of sounds of a low pitch have been destroyed by taking out the anterior portion of this region of the brain and all knowledge of sounds of a high pitch by cutting out the posterior portion.

The same thing has been done with the memories connected with taste and smell and touch. If the upper lateral portion of the brain is extirpated all touch memories will be lost and cannot be regained unless some portion of this area remains intact. The large motor area treasures up all ability to move the different organs of the body. If this area is taken out all the other powers may continue to perform their appropriate functions, but all memory of how to bring about voluntary movements of any part of the organism will entirely disappear.

What physiologists have established by a great multitude of experiments such as those described above is fully confirmed by the teachings of anatomy. In every case the areas experimented upon have been found to be connected by delicate white fibres carefully insulated with their respective external organs. The sight areas are connected in this way with the eye, the sound areas with the ear, the touch areas with the skin, and the areas connected with voluntary movements with the muscles. The fact that every portion of the cortex of the brain has its own memory is as true of man as of the lower animals. The anatomy of the human brain proves this, and what physiologists have done in the case of animals by extirpation is done in the case of man by disease.

A clot of blood in any one of these areas may easily destroy its retentive power. For the arteries that terminate in the little cone-shaped masses of grey matter that make up the cortex of the brain do not connect with each other at their extremities as they do in some organs. Hence they sometimes get plugged up, shutting off all nourishment from the cones and causing them to wither and die. When this occurs the memories treasured up in these cones perish also. The larger the artery plugged, the larger the area of the brain destroyed and the greater the loss of memory occasioned thereby. The process of nature which results in the atrophy of certain portions of the brain leads students of pathology to the same conclusion concerning man as has already been established by experiments upon animals. By a post-mortem examination of the brain of man it is found that the loss of sight memories is connected with the atrophy or lesion of the sight area of the cerebral cortex, the loss of sound memories with the atrophy or lesion of the hearing area, the loss of taste memories with the atrophy of the taste area, and so for all the other memories.

One of the greatest experts on this subject in our day is Professor Allen Starr, of the College of Physicians and Surgeons in New York. Among the many cases he has described for us are the following: An intelligent gentleman suddenly discovered that he had become blind in the right half of both eyes. He could see only one half of a ball placed before him. He could not read, although he saw the letters as distinctly as ever. For he had lost the memory

of their significance as recognised through the eye. He could write as well as ever, but could not read what he had written. The memory of the motion required to produce the letters remained, but the memory of their appearance was lost. He could read books made for the blind because he could bring the motor organs into play and come to appreciate the meaning of the words in that manner. He could not recall the faces and scenes of the past or recognise the objects about him as known before. When he went out into the street everything was new to him and he could not find his way about. The general mental vigour of this man was not noticeably impaired. He had no paralysis. His other memories were good. He could reason as well as ever about his past experiences except those of sight. On the basis of many other similar cases that had been carefully examined, the physician who had him in charge knew at once that the disease was located in the posterior part of the left half of the brain and that the only thing for him to do was to begin to learn to read again just as he began when a boy.

Another case given by Dr. Starr is that of a man noted among his friends for his excellent memory. It was said of him that he only needed to read a passage over once carefully to remember it verbatim. One day he suddenly discovered that everything about him was strange and unfamiliar. He could not recall by sight anything he had known before, —even the faces of his wife and children. When they came to him he could recognise them only by

the sound of their voices. "He even forgot," says Dr. Starr, "his own appearance, and, being in a large public gallery, and seeing, as he supposed, some one in a doorway barring his passage, he stepped forward to ask the stranger to let him pass, when by the motions he realised that it was his own figure seen in a large mirror." This loss of sight memories affected even his dreams. For he no longer saw objects in his dreams, but all his dream constructions had to do with material furnished by his other senses, such as sounds and tastes and smells.

A third of these cases well illustrates the fact that a loss of visual memories is not always permanent. A district messenger boy known to Dr. Starr on several occasions suddenly lost all knowledge of the streets where he was to deliver his messages, although he had been familiar with them from childhood, and had to be shown his way home by the police. After the lapse of a few hours the lost knowledge would come back to him. "This loss of memory," says Dr. Starr, "can be explained by the hypothesis that a spasm of the arteries occurred in the posterior part of the brain, just as such a spasm in those of the face gives rise to a sudden pallor."

Loss of memory of some kind often occurs as a result of a fever or some physical injury and may continue for some time after the patient has fully regained his usual healthfulness. Dr. Abercrombie records the case of a surgeon who on recovering sensibility after a fall from his horse gave minute directions as to how he should be treated, but lost

entirely all recollection of his wife and children. This did not return to him until several days afterwards. An eminent professor of political science known to the writer lost, when a junior in college, all his knowledge of the classics in consequence of a fever, and it did not come back to him for several months after his general health was fully recovered.

Frequently the loss of memory in these cases is never regained. Dr. Beattie tells us of a Greek scholar who lost all his knowledge of that language in consequence of a blow on the head, although experiencing no other ill effects from the blow as far as could be ascertained. Dr. Carpenter reports the case of a boy who, being struck on the head, lost all knowledge of music and never regained it, although nothing else apparently was knocked out of him at the time. Forbes Winslow tells us of a man who on recovering from an illness merely forgot the letter F. Many peculiar facts of this sort are recorded by the ancients. The elder Pliny tells of a man who received a blow from a stone and forgot the letters of the alphabet only. "Another person," he goes on to say, "who fell from a very high roof could not so much as recollect his mother, or his relations and neighbours. Another person, in consequence of some disease, forgot his own servants even; and Messala Corvinus, the orator, lost all recollection of his own name." From these and other cases he draws the following conclusion: "Nothing in man is of so frail a nature as the memory; for it is affected by disease, by injuries, and even by fright; being sometimes partially lost, and at other times entirely

so." In all these cases there is undoubtedly an impairment of tissue or weakness of function in some brain centre. If the brain centre has entirely atrophied the loss of the memory will be permanent. If the lesion is only partial new memories may be formed quite similar to the old ones; and if the loss of memory was due simply to temporary spasms of the arteries, it may be almost entirely restored.

When it is argued that retention is physical it is sometimes objected that there is not room enough in the brain to treasure up all our past acquisitions. The objection is based on an ignorance of the facts. The number of separate acquisitions even in the life of the most highly intellectual is only a few thousand. It is now maintained by careful students of the subject that the number of cells in the cortex of the brain reaches up to several billions. Recent experiment in the neurological laboratory of Chicago University makes the number over 9,000,000,000. When we remember that a single germ cell may transmit all of the characteristics of the parent, even as to the colour of the eyes and hair, we must admit that only a small fraction of the brain capacity of any human being is ever called into special service.

Only by recognising that retention is physical are we able rightly to answer the question, Where is the idea between the time of its first apprehension and its reappearance in consciousness perhaps years afterwards? Clearly it is nowhere. As Professor Paulsen of Berlin University remarks, "Ideas do not exist in the brain; one might just as well say they are in the stomach or in the moon. The one

would not be more absurd than the other." If an idea exists at all it exists in the mind. It goes out of existence on leaving consciousness. Its appropriate brain cell treasures up the possibility of its return, but it will not come again into existence until it is recreated in just the same way as it was originally perceived. Only on the basis that retention is physical do we see why it is that one of the most cautious psychologists of to-day asserts that "no tenable ground exists for speaking of a special organ or seat of memory. Every organ—indeed every cerebral area and every psychic nerve cell—has its own memory."

The second element that we discover in the analysis of any completed act of memory is reproduction. It is easy to see that a purely physical act cannot account for the reappearance of an image in consciousness. Retention cannot be the whole of memory, although without retention there can be no recollection of a previous conscious act or state. Matter cannot recall anything any more than the shoe can recall the pegs driven into it or a violin the strokes of the bow that have been drawn across its strings. The molecular changes that have taken place in the brain account for retention and the direction given to the flow of our memories, but they do not account for the revival in our consciousness of a mental image. As another expresses it: "The physical process determines what I shall remember; the mental process how I shall remember it."

That the reproduction of a past experience is partially physical is involved in the position of modern

psychology that all representation is presentation over again, the only difference being a difference in degree, not in kind. And just as the original presentation required a stimulus to arouse the brain cells into action before there was any idea of the object produced, so there must be a stimulus to arouse the brain cells into a similar action before there will be any idea of the object reproduced. This new stimulus of the centres generally comes from within, but it is by no means always mental. There is a vast number of changes constantly going on in the bodily organism, especially in the brain itself; any one of which may excite the centres so as to bring about the reproduction of the original experience.

An excellent example of this way of bringing about such a reproduction is the case of the servant girl reported by Dr. Abercrombie and quoted at length by Calderwood in his work on *The Relation of Mind and Brain*. Soon after this girl went out to service in a certain family beautiful music was often heard in the house during the night for which no cause for a long time could anywhere be discovered. At length the sound was traced to the room of the new servant, who was found fast asleep, but uttering from her lips sounds exactly resembling the tones of a small violin.

“On further observation,” says Dr. Abercrombie, “it was found that, after being about two hours in bed, she became restless and began to mutter to herself; she then uttered sounds precisely resembling the tuning of a violin,

and at length, after some prelude, dashed off into elaborate pieces of music, which she performed in a clear and accurate manner and with a sound exactly resembling the most delicate modulations of that instrument. During the performance she sometimes stopped, made the sound of retuning her instrument, and then began exactly where she had stopped in the most correct manner."

When she awoke she was usually in some degree of fever, and had pains in her throat and chest for several days after, but she had no recollection of what took place during her sleep. Furthermore, she had no talent for music whatever, could not tell one of the pieces from another when they were played over to her, and had no recollection of ever having heard them played before by anybody.

A search into her previous history brought to light the fact that when about seven years of age she had lived in a family where the room next to her sleeping room was occupied by a man who sometimes played on a violin for a while just before he retired, and had played these pieces among others. In this case the girl in all probability reproduced the music automatically. Some change in her physical condition called into activity the brain cells that treasured up the original experience and the organism responded to the call.

Another interesting case of this sort is given us by Coleridge in his *Biographia Literaria*. A young woman in a town in Germany who could neither read nor write when seized with a fever talked fluently in Latin, Greek, and Hebrew. Whole

sheets of the sentences she uttered were taken down and found to be intelligible. For a long time the matter remained a mystery, but a physician who became greatly interested in the case finally succeeded in unravelling it. He traced the woman's history back to the time when as a girl of nine years she had lived in the family of an old German pastor. He also found that the pastor was in the habit of reading aloud out of his books in a room adjoining the kitchen where the girl did her work. "The books were ransacked," Coleridge continues, "and among them were found several of the Greek and Latin Fathers, together with a collection of Rabbinical writings. In these works so many of the passages taken down at the young woman's bedside were identified, that there could be no reasonable doubt as to their source."

Among the patients in the asylum for the insane at Middletown, Connecticut, in 1884 was a man who had formerly been a labourer in a stone quarry. When allowed to walk about the grounds he would frequently stop under a tree, lean his walking-stick up against its trunk, and then after pacing off about ten feet from the tree turn round and declaim to the stick in the most classic English. His orations were taken down and found to be selections from an old reading book that he had used in school when a boy. In his rational moments he had no knowledge of these orations and the evidence was good that he had never consciously committed them to memory. A Lutheran clergyman in Philadelphia who had a large number of Germans and Swedes in his congre-

gation found that when they were sick they would often repeat prayers in their native tongue, although they had not used the language in some cases for fifty or sixty years and had no knowledge of it when in their normal condition.

All these cases are in substance frequently repeated in the experiences of everyday life, although of course in a much less striking manner. Every skilful musician can dash off a simple piece he has often played before and at the same time keep up a rapid conversation with those at his side. An expert typewriter is not conscious of the continuous reproduction of the muscular exertion necessary to move the fingers, and very rarely do any of us mentally reproduce the motions of our tongue and lips in ordinary speech.

All present memories are constantly tending to become organic. By frequent repetition every act requires a less expenditure of force to bring it about. This is true both of the physical side of the act and the mental side. Less blood flows to the brain, less nervous energy is expended, and less heat is generated by the chemical process involved; at the same time the amount of conscious force put into the act is greatly lessened. In this way the act that was at first performed by great effort may become entirely automatic, the conscious element disappearing altogether. All our thoughts tend to store themselves up in our nervous system, just as the sun stores up its energy in the coal. In this way what is called organic memory is developed, that is, the organism reproduces the acquisitions of the past without the

need of conscious effort, leaving the mind free for higher attainments. This alone makes progress possible.

If every time we performed an act we were obliged to consciously remember all the steps necessary to perform it, no mental energy would be left for new acquisitions and all advancement would be thwarted at the outset. Our instincts now attend to our grosser wants. Without them we should revert almost to a protoplasmic state. For the lowest organised brute comes into life with a large number of instincts which are simply the inherited memories or habits of previous generations. Many of our inherited habits were once consciously formed and consciously reproduced, but now they spring into action automatically whenever the appropriate environment presents itself to view. This is the truth expressed in the statement of Herbert Spencer that "memory embraces all that class of facts which are in process of becoming organic. It continues as long as these facts are being organised and disappears when their organisation is complete." It is also the truth in Hering's famous lecture before the Imperial Academy at Vienna in 1870, "On Memory as a Universal Function of Organised Matter." But he and all other writers are wrong who hold that organic memory is the whole of memory or is its chief and most important factor.

For, while admitting that experience proves beyond reasonable doubt that the reproduction of past experiences may often be physical, and admitting also that the same brain cells are used in reproduction

as in the original acquisition, yet it must be insisted upon that the conscious revival of the original image or idea is always a mental act, not a physical. Even when the nervous system is artificially excited to great activity by some such stimulant as strong coffee, opium, or hasheesh, there will be no conscious reproduction without the co-operation of the mind. And if we wish to make the reproduction as accurate and vivid as possible, we must shut out all distractions so that the mind may give its entire energy to the matter. It is no accident that we so often close our eyes and rub our heads when trying to recall something that seems for the moment to have eluded us.

But an act of memory is not completed until we add the act of recognition, and this is wholly a mental act. The retention might be perfect and the reproduction exact and continuous and still there be no true act of memory. What has been retained is of no value unless it is reproduced, and what is reproduced cannot tell us anything of the past unless we can re-know it. The chief element in human memory is recognition. It is in this act that we come to know ourselves as now in a condition that we were in once before. That is, in a completed act of memory we know ourselves as the same selves that we were in the original acquisition. The past we recall and recognise is known as *our* past. Hence memory necessarily involves when properly analysed our continued existence between the time of the first perception and the recognition of the thing then perceived.

With this analysis before us of what it is to remember, we are prepared to discuss intelligently what it is to forget. With the old views of memory (as purely a mental act) it was often held that forgetting is impossible. Anything that had once come into the mind will remain there for ever. Present experiences may temporarily crowd the past into the background, but almost any moment circumstances may arise when it will all come up into vivid consciousness. But when we take into consideration the facts given above that show that all retention is physical and that there are as many different kinds of memory as there are different organs of sense for acquiring knowledge, it is evident that it is not at all a difficult matter to lose and lose permanently a part or the whole of any kind of memory. Even if retention is perfect there may be a failure in reproduction or recognition, and any failure in either will involve a loss of memory.

Some of the ways in which a loss of memory may occur are brought to light in attempting to diagnose a case of aphasia or loss of speech. Suppose a young lady was asked if she liked ice-cream and no answer came in response. The failure to reply might be due in the first place to the loss of all her hearing memories and the power to hear at all; and in the second place to a loss of the hearing memories only, and therefore she could not attach any meaning to the inquiry, although she distinctly heard the words. In the third place, she may have lost the memory of how to connect the inquiry with her other knowledge so as to come to a conclusion. In

the fourth place, she may have lost her memory of how to put the conclusion into words provided she had formed it; and lastly, the failure to reply may have been due solely to loss of memory as to the proper way of putting into motion the organs of speech so as to express the conclusion to others.

The memory of children before the fifth or sixth year is very weak and uncertain because the association tracts in the brain are not firmly established before that age, while old people fail in memory because the brain centres are beginning to atrophy. After recovery from fevers it not infrequently happens that some kind of knowledge is lost and lost for all time.

But even where there is no known impairment of brain tissue grave doubts are often to be thrown over the trustworthiness of memory. We are obliged to say after almost every statement concerning the past, "Perhaps I dreamed it," "Unless my memory plays me false." Those whose business it is to weigh evidence put the least confidence in memory unsupported by documentary evidence. Lawyers and historians are proverbially suspicious even of their own memories, to say nothing of the memories of others. Unlimited confidence should not be put in the testimony of an eye-witness even, although his own belief in his accuracy be most undoubted. It is extremely easy after a short lapse of time to mix up what we imagine with what we actually recall. Nicolay and Hay are said on good authority to have received very little aid in writing their history of Abraham Lincoln from the memory

of his contemporaries and to have adopted the maxim that mere memory unsupported by documentary evidence is "utterly unreliable after a lapse of fifteen years." The writer asked a class of seniors in college to write out on a sheet of paper what they remembered about the weather on the Wednesday immediately preceding, fifteen minutes being given them to collect their thoughts. About twenty per cent. answered fair and cold; eighteen per cent., mild and slushy; twelve per cent., rainy all day; thirteen per cent., cold and cloudy; seventeen per cent., fair and windy; twenty per cent., a warm day for winter and cloudy.

Pseudo-reminiscences are not only very common among the insane, where, as Kraepelin has shown, they are often created by the imagination out of whole cloth, but probably half of the people one meets in the ordinary conditions of life have had at times experiences of a similar sort. Almost everybody has had the feeling when in an actually new place or condition of having been there before. The phenomenon of so-called double memory is far more common than we think.

It is not impossible to manufacture testimony *de novo*, and well-informed persons do not hesitate to affirm that it is sometimes done. Some lawyer, let us say, is looking about for a suitable witness to an alleged event. He selects some person of a rather weak memory who might have been connected with it. He tells him carefully at their first meeting all the details of the event in question, but says nothing to him about remembering it. They meet again

shortly and the lawyer goes over the same story and this is repeated on many successive occasions. After several weeks perhaps when the witness is asked if he remembers the event, he may hesitate, not being quite sure whether he does or not. But the images of the imagination that the lawyer's story has aroused will soon do their work. In a few months all will be clear to him and he will go into any court and swear to full knowledge of the event with the utmost sincerity. All careful students of the subject of memory will agree, I think, with Professor Burnham of Clarke University, who has made the subject a special study, when he says: "We remember only the main features of an event and the imagination fills in the gaps. Thus remembrance is never a true reproduction of reality. It is always more or less of an illusion. At best it is an approximation to the truth."

This view of the fallibility of memory emphasises the importance of doing everything that in us lies to strengthen and extend its power. For although a phenomenally good memory is not the sure mark of a genius, there is no doubt that a good memory is essential to success in any calling in life, whatever that calling may be. Inasmuch as we cannot remember everything, the first thing we should do is to decide what we want to forget. The art of forgetting is of prime importance to all progress. Our mental energy is a limited quantity and should not be wasted on unimportant details. It is necessary to learn how to forget in order to know how to remember. We should learn to detect quickly what

is essential and put the rest out of our mind by main force if necessary. The philosopher Kant for many years had a servant by the name of Lampe, but as the servant became grossly irregular in his habits and could not be relied upon he was obliged to discharge him. Thereupon Kant is said to have made this note in his daily journal: "Remember to forget Lampe." Ladd in referring to this incident well says that "men of strong character acquire unusual facility in refusing attention to things they desire to forget." Forgetting, instead of being an infirmity, may often be the one stepping-stone to advancement. We should strive to forget everything that does not help us to an understanding of the universe. The mind that refuses to forget is out of harmony with the condition of things. Forgetting the things which are behind in every high calling necessarily precedes pressing forward to the things which are before.

After having decided what to throw aside and what things it is worth while to remember, we should bear in mind the natural law that memory is in proportion to attention. Just as all real forgetting involves withholding the mind from the things we wish to ignore, so all real remembering involves fixing the attention upon the things we wish to re-know. This is the reason why, other things being equal, those things are the best remembered that are the most recent, the most interesting, the most frequently repeated. Any one who wishes to succeed in any given undertaking or calling must pay attention to the things that relate to it. A safe and

reliable memory of its details can come in no other way.

Remarkable instances of the development of memory are on record, but some of them are probably exaggerations. Cyrus, it is said, learned the name of every soldier in his army. Themistocles knew by name every one of the twenty thousand citizens of Athens. Scaliger committed to memory the whole of Homer's *Iliad* in twenty-one days. Zukertort learned how to play twenty games of chess at a time with his eyes blindfolded. Zacharias Dase learned how to tell at a glance a row of 188 figures and repeat them forward and backward. Gustave Doré and Horace Vernet painted portraits from a single sitting and another painter reproduced Rubens's *Martyrdom of St. Peter* from memory so perfectly as almost to deceive the experts. Leibnitz, Niebuhr, Pascal, and many others have performed equally marvellous feats of memory in their special fields. But it would be extremely unwise for most men to try to imitate these examples. For it would involve a loss of mental energy needed in other directions, even if it did not result in a general mental decline from an overstraining of this special power.

While memory is in proportion to attention, attention is in proportion to interest. Hence if we wish to remember well we must do all we can to stimulate interest, and this can best be done by forming a clear and definite conception of an end to be attained. Without such an end it is extremely difficult to excite interest and practically impossible

to have any memory of what we have done that can be relied upon. A stenographer can write volumes of letters at the dictation of others and not be able to recall a single sentence, perhaps even a single word, without the greatest effort. On the other hand, the details of what in itself would be a most irksome task may quickly be reproduced if it is known beforehand that one's means of livelihood are dependent upon so doing. Interest makes memory reliable because it makes acquisition agreeable and at the same time easy and sure.

While it is true that concentrated attention is the key to a sound and trustworthy memory, it is evident that all people regardless of their age and occupation should not try to remember exactly the same things. Children, for example, should concentrate their attention upon what they are experiencing through their senses, mainly upon what they see and hear. Later upon words and places and events. Words are condensed memories. By remembering words we remember things they represent. Most of our adult memory is word memory. For, as another has said, we all carry about our past experiences done up in verbal packages. Children should early get acquainted with the common words for things in other languages as well as their own. For they can easily remember them then, while later it would be far more difficult. And so with the geography of their own and other countries and the chief events of history, mainly in the form of simple biographies. The recognitive element in memory is generally weak in children, and we should be satisfied

if the reproductive element comes out good and strong. But adults after the concept centres of the brain have developed should attend chiefly to the logical relations of things,—to ideas, to arguments, and to courses of thought. Unless they develop a strong logical memory they can never succeed in the higher walks of life. A good local and temporal memory is essential to a housemaid or valet, but it is relatively of little value in the larger spheres of usefulness and is cultivated at the expense of the higher powers.

Moral character has more to do with a good memory than is generally supposed. Liars as a rule have extremely poor memories. The reason of this is that they spend all their time in trying to put things together in wrong relations. They take up arms against things as they are and attempt to make them what they are not. As a consequence their thoughts often get into such confusion that they cannot tell what the truth is, however much they may strive to do so. It is a well-known psychological fact that liars not infrequently come to believe in the reality of their own fabrications. A good conscience as well as a good digestion helps to keep the brain clear and the understanding keen and vigorous. And as it is only under these conditions that we can perceive things to begin with in their true relations, it is evident that we must constantly strive to keep the conscience pure and untroubled if we are going to recall things with the least expenditure of mental power.

Various devices have been invented in the course of history for assisting the memory, but most of

them have not shown themselves to be of any real value. Cicero and Quintilian were the first to elaborate methods of this sort. The expressions "in the first place," "in the second place," etc., are said to be due to the ancient mnemonic system of imagining a large house with many rooms in it and filling each room in regular order with the things to be remembered. When an orator came to the delivery of his oration all he had to do was to walk into the house, rummage around, and tell what he saw. When another discourse had to be prepared another house was imagined and fitted up as before, till at last a person constructed a mnemonic street or city which he was supposed to walk through at his leisure. During the Middle Ages much attention was given to mnemonic devices and many books were written on the subject, but apart from such meaningless words as "vibgyor," to designate the order of the colours in the solar spectrum, and a few such rhymes as "Thirty days hath September, April, June, and November," most of them seem to be well characterised by Bacon, who compares them with a rope-walker who is to be admired for his dexterity, but not otherwise to be highly esteemed.

There is no royal road to the development of a good memory. The laws of psychology are inexorable. The only rational way by which a thoughtful person can do much toward the cultivation of his memory is to keep a sound mind in a sound body, logically to apprehend and classify his facts, and then to put them in the closest relations possible to the most central and permanent interests of his life.

CHAPTER IV

HALLUCINATIONS AND THEIR RELATION TO MENTAL DEVELOPMENT

LORD BROUGHAM at one time in his career earnestly endeavoured to establish a law making the existence of an hallucination proof positive of insanity, and he based his argument upon what in his day was universally considered to be valid ground. He admitted without hesitation that we are all frequently subject to illusions of the senses, but he insisted that a mind that experiences an hallucination is no longer in possession of its normal powers.

According to all the authorities in psychology of that period an hallucination was a purely arbitrary creation of the mind, while an illusion had a connection with some objective reality. For example, if a person thought he heard the voice of a friend when no voice at all had called him, he was said to have an hallucination; but if he had mistaken some other voice for that of his friend, his state of mind was called an illusion.

It is now known, however, that there is no such thing as a pure creation of the mind. We can no more make something out of nothing in the mental

world than we can in the material world. In every mental creation the mind must call upon its past experiences and make use of the brain cells not only to call up those experiences, but also to put them together into new relations, whatever those relations may be. There is, therefore, no real difference between hallucinations and illusions and the distinction should disappear. They are both merely false interpretations of certain signs, and these signs are always due to a cause as truly external to the mind in the one case as in the other.

The possibility of making these false interpretations primarily arises from the very nature of perception itself, which so far from being a simple affair is the most complex and intricate mental operation of which we have any knowledge. In any one or all the steps of this process mistakes may occur. The unreflecting man thinks he has an immediate face-to-face knowledge of the objects about him, but the truth is that no one ever perceives anything immediately, or without a very complex process involving acts of memory and imagination as well as the exercise of the reasoning powers.

The invariable prerequisite of a perception of any sort is the existence of a sensation. This is immediately known by the mind. But what has given rise to this sensation is quite another matter. It can never be known with absolute certainty. If the sensation happens to be a little out of the ordinary, it may take a long time to make up one's mind what the so-called external object is that is connected with it; and when one has made up his mind about it, he

may be far astray from a sound judgment in the matter—which is the same as saying that he is labouring under an hallucination in the case.

All minds that attain knowledge through the use of their senses experience hallucinations, and the difference between a well-developed mind and an immature mind is in this respect a difference in degree and not of kind. At the dawn of mind when we first began to use our mental powers probably all our perceptions were hallucinations. Lotze, a great German thinker, goes too far, however, when he asserts that “the whole of our apprehension of the world is one prolonged deception,” and Taine equally errs in his famous work on *Intelligence* when he declares that all perception is hallucination, even though in some cases it may turn out to be true.

Still it must be admitted that it is out of a world of hallucinations that we gradually come to a clearer and more accurate appreciation of things as they are. After the young of the human species have passed through all the lower stages of animal development, they come to a time in their experience when they try to ascertain the causes of their sensations. And it is not at all remarkable that they cannot tell with any accuracy, until after many experiences, whether the cause is within or without the bodily organism. If they guess in any given case that the cause is within the body when in the common judgment of mankind it is without, we call their opinion a wrong guess, an hallucination. The likelihood that the first guesses will be correct more

frequently than erroneous is very slight, and the likelihood that any human mind will ever become infallible in its guesses is slighter still.

A convenient classification of hallucinations and one sufficiently accurate for our purpose is made by dividing them into three groups, hallucinations of sense-perception, hallucinations of memory, and hallucinations of reflective thought. A brief examination of each of these groups will make it evident why hallucinations are so frequent and enter so largely into all our mental life. Probably the most common of all hallucinations occur in connection with the sense of sight. This is not remarkable when we consider how much we use this sense and how easy it is to attribute the cause of sensations of sight to some object external to the body, when in reality they have been due to other causes, such as some irritation of the retina, some mechanical pressure upon the optic nerve, some agitation of the sight centre brought about by physical changes going on in the cells themselves, or the direct agency of the mind in its influence upon the body.

In case the sensation is occasioned by a slightly diseased condition of the retina there may be no way for the person to find it out except by indirect information through some other sense or the statement of a physician. And as this information may never come to him, his interpretation of his sensation may continually be erroneous for that very reason. A tumour in the brain pressing upon the optic nerve, or a temporary commotion of the brain cells may be the cause of endless sensations of sight; and if the

mind has no other data to work on, it cannot be expected to attribute them to their real source.

How we all first learned to see is well illustrated by the famous case of Kasper Hauser. This boy when about seventeen years of age was mysteriously left in the streets of Nuremberg, Germany, at midnight, May 26, 1828. A letter was attached to his person giving the date of his birth as April 13, 1812, but nothing else of moment concerning his history. About the only thing the boy himself could tell of his past life was the fact that he had always been kept in a dark place underground, his food being given to him by a person who never showed his face. His noble bearing (being, as is now supposed, the abandoned illegitimate son of Grand Duke Charles of Baden) and his pitiable condition excited the greatest interest and sympathy in his behalf. Friends were at once found for him who gave him a comfortable home and sent him to school. His education was, however, soon cut short. For after repeated attempts to kill him made by unknown persons he was waylaid while walking in the royal gardens at Anspach and put to death by assassins on December 17, 1833. Sometime before he died, however, he wrote out what has come down to us as his own account of how the world appeared to him when he for the first time in his life saw the light of day in Nuremberg.

In this account he says: "What I then saw was very ugly; for when I looked at the window it always appeared to me as if a window-shutter had been placed before my eyes, upon which a wall-

painter had spattered the contents of his different brushes filled with white, blue, green, yellow, and red paint, all mingled together. Single things, as I now see things, I could not at that time recognise and distinguish from each other." In other words, when he looked out of the window in the light of the sun, he did not see fields, hills, and houses, as we adults see them, but as a baby first sees them,—one indiscriminate blotch of colour without form or significance. This coincides with what is now the everyday observation of oculists.

When a surgical operation has enabled persons born blind to see they always find themselves in a maze of hallucinations regarding the interpretation of their new sensations, and it is only after long and often painful experience that the maze gradually begins to clear away. They invariably declare that the objects either touch their eyes or are very close to them. All they at first perceive is simply a confused patch of colour. They have to learn just as an infant does that the different spots on the patch stand for external individual objects. These experiences confirm the teaching of modern psychology that we very gradually learn to see and that we make a multitude of mistakes in so doing. Even at our best we often err egregiously as to the size of objects, their distance, and their true form.

We cannot help calling a mole-hill a mountain if we suppose the object is far away; and, if the air is a trifle misty, an object near at hand we are obliged to locate at a distance so great as to give us almost no conception of its true character. Everybody

knows that the moon is not so large to our sight when seen directly overhead as when seen near the horizon, especially if trees and other objects intervene. Two squares of equal size are not equal to us if one is seen with parallel lines drawn on it and the other has a plane surface. A right angle is much larger than it really is to everybody's sight if it is divided up into small angles. If this is true of such simple objects as squares and angles, what must be the case with nearly all the objects of our everyday experience which are vastly more confusing and complex?

Next to hallucinations of sight come perhaps hallucinations of hearing. Anything that affects the hearing centre in the brain may give rise to sensations of sound, and we can never tell with absolute certainty whether the centre has been agitated by an impulse coming from within the organism or without. The mother who hears her dead child calling her may be interpreting sensations of sound as faithfully as any of us when we reply to the question of a friend who has called to inquire after our health, or to invite us to dinner. We have to learn how to hear just as we have to learn how to see, by oft-repeated experiences, some successful and some unsuccessful. If the usual conditions under which the experiments are made are very much changed, we may constantly err as to the direction of sounds as well as the distance and location of the objects that occasion them. "The beating of our own hearts," says a noted psychologist, "may be mistaken for a knocking at the door, the trampling of horses in

a neighbouring stable and the cutting of wood in a neighbouring cellar may be thought to be within our own dwelling. The rattling of a cart on a bridge may be mistaken for distant thunder; the humming of a mosquito, for a distant cry of alarm or the sound of a trumpet."

Professor James of Harvard, in describing the ease and completeness with which we are often deceived as to the cause of our sensations of sound, gives one of his own experiences in illustration.

"Sitting reading late at night," he says, "I suddenly heard a most formidable noise proceeding from the upper part of the house, which it seemed to fill. It ceased, and in a moment renewed itself. I went into the hall to listen, but it came no more. Resuming my seat in the room, however, there it was again, low, mighty, alarming, like a rising flood or the *avant courier* of an awful gale. It came from all space. Quite startled, I again went into the hall, but it had already ceased once more. On returning a second time to the room, I discovered that it was nothing but the breathing of a little Scotch terrier which lay asleep on the floor." And he adds: "The noteworthy thing is that as soon as I recognised what it was, I was compelled to think it a different sound, and could not then hear it as I had heard it a moment before."

Almost the same day a friend who was calling at his house, on hearing a certain sound, exclaimed, "Hollo! hear that hand organ in the garden." It was with the greatest difficulty that he was persuaded that all he heard was the striking of the clock (in the

very room where he was sitting) which happened to have a rich low chime.

The frequency with which hallucinations occur in connection with sensations of hearing makes our interpretation of such sensations most untrustworthy when much accuracy is required. On some of the pilot charts issued by the government at Washington we find the warning printed in red ink: "Shipwrecks are often caused by the insistence of mariners on the infallibility of their ears. . . . Implicit reliance on sound signals often leads to danger, if not death."

We know that all sensations of hearing are occasioned by something external to the mind. They cannot exist unless the cells of the hearing centre of the brain are somehow thrown into agitation. But whether the something that agitates them is within the brain itself or external to the body can never be settled with absolute certainty. From childhood to old age, all we can do amid a world of possible hallucinations on such matters is to judge as best we may what the cause of the sensation is and gracefully abide by the result.

Aristotle long ago pointed out that we can easily be deceived as to our perception of touch by crossing the fingers and feeling some small object, as a pea or a marble. It will invariably be regarded as two objects. The reason is that we are not in the habit of using our fingers in that way. The new sensations do not fit in with our preconceived system of things in space. A tooth touched by the tongue is a great deal larger to us than when touched by the finger. The two points of a divider seem as one to us when

pressed against the middle of the back, if they are not spread more than two and a half inches apart. "To our sense perception," says Dr. Scripture, a great experimenter in such matters, "a pound of lead is heavier than a pound of feathers." If a man were lifting a ten-pound weight he would not know it if three pounds more were added to the burden. If we plunge a cold hand into warm water it is hot to us, and if our hand is hot the same water is cold to us. A person could easily be boiled to death without his knowledge if we had all the facilities for performing the experiment. Frogs are often so treated in psychological laboratories by very gradually increasing the temperature.

A flat object laid upon the hand will invariably seem convex to our touch if the pressure at the centre is increased, and concave if the pressure is diminished. A cold object is always heavier to us than a warm one of the same weight. When potassium was first discovered everybody who handled it thought it was far heavier than it actually was simply because it had a metallic lustre. People with sight make the wildest estimates as to the kind of objects they are brought in contact with through touch when experimented upon in the dark.

Some of the most curious of all tactual hallucinations are connected with our dress. We actually do think that we increase our sphere of influence when we put on a tall hat, or a claw-hammer coat. The savage is far more of a terror in his own eyes, as well as in the eyes of others, when he gets on his war-paint and feathers. The chief object of a lady's

train is to impart the sense of elongation, and any indignity to it is resented as to her own person. The custom of taking off the hat in the presence of certain people and making a low bow is largely based on the hallucination that we thereby diminish the amount of space we occupy in the world and increase that occupied by others.

It is hardly necessary to bring further illustrations from our everyday experiences with the senses to establish the position that hallucinations are always occurring in what we call normal life. But what we need to note is that the difference between the daily experiences of the sanest of us and the experiences of the hypnotic subject and the lunatic is in this regard merely a matter of degree. We all to a certain extent see what we expect to see, hear what we expect to hear, smell what we expect to smell,—in short, experience almost anything that we expect to experience. It is a well-attested fact of modern psychology that the mind can so affect the cells of the brain as to give rise to sensations just as real as any that ever come within our knowledge. As Ladd expresses it: "Attention not only intensifies sensations, it actually creates them." This is simply saying that all human beings are influenced by the power of suggestion and the fact is abundantly confirmed by experiment as well as the common experience of mankind. We cannot think of a person so low down in the scale of intelligence as not to be affected by it.

How easily hallucinations may be induced by the application of this principle of suggestion is shown

by oft-repeated experiments in crystal gazing, and especially those conducted upon hypnotic subjects. A few of the latter by well-known authorities are here in point.

“ I have frequently made,” says Professor Forel, “ the following experiment. During the hypnosis I told Miss L. that on awaking she would find two violets in her lap, both of them natural and beautiful, and that she would give me the prettier flower; but I laid a real violet on her lap. On awaking she beheld two violets; one was brighter, more beautiful, she said, and therewith she gave me the corner of her white pocket-handkerchief, but kept for herself the real violet. I now asked whether she believed that both violets were real, or whether one of my supposed presents known to her from previous experience were among them. She said the brighter violet was not real, because on the pocket-handkerchief it looked so flattened. I repeated the experiment with the suggestion of three real equally dark violets, not at all flattened but fragrant, with stem and palpable leaves; but I only gave her one genuine violet. This time Miss L. was completely deceived, and was utterly unable to tell me whether one of the violets, or two, or indeed all three, were real or suggested.”

Another case he gives is the following:

“ I hand to another hypnotised lady a real knife, and tell her there are three. Though fully awake she is absolutely unable to distinguish the supposed three knives one from another, not even if she employs them for cutting, if she touches them, or drums on the window pane. When other persons later derided her on the score of her

illusion, she grew angry and firmly maintained that there had been three knives, that I only later had hidden two of them; she had seen all three knives, felt, heard them, and would not yield on this point."

Bernheim records the following experience with an hypnotised patient: "In six days," he told her, "during the night between Thursday and Friday, you will see the nurse come to your bed and pour cold water over your feet." On the following Friday she loudly complained that the nurse had poured cold water on her feet during the night. The nurse was called but naturally denied it. He then said to the patient: "It was a dream, for you know how I can make you dream; the nurse has done nothing." She emphatically declared that it was not a dream; for she had clearly seen it, felt the water, and become wet.

The following case is given by Beaunis:

"On the afternoon of the 14th of July, 1884, I hypnotised Miss E. and gave her the following suggestion: 'On the 1st of January, 1885, at 10 A.M., you will see me. I shall come to wish you a Happy New Year; after that is done I shall immediately disappear.' I did not mention this suggestion to anybody. Miss E. lives in Nancy. I was myself in Paris on the 1st day of January, 1885. That day Miss E. told a friend, a physician, and several other persons that on the same day at 10 A.M., when she was in her room she heard somebody knocking at the door. She said: 'Come in!' and to her astonishment saw me enter, and heard me with a cheerful voice wish her a Happy New Year. I immediately went out; she

hastened to the window to see me leave the house, but did not see any further trace of me. To her surprise she also noticed that I, at that season, had come to her in a summer dress (the same clothing that I wore at the time of the suggestion). Her attention was in vain called to the fact that I was in Paris on the 1st day of January, and could not have come to her on that day. Nevertheless she maintained that she had seen and heard me, and she is still convinced of that, in spite of my declaration that it was impossible."

The strongest confirmation of the reality of hallucinations is the series of experiments made by Feré and Binet showing that suggested images are obedient to the laws of optics as truly as real ones. For example, an hypnotised subject was told that when she awoke she would see a portrait on the table. She did so, and when Feré held a prism before her eyes she saw it double, although she had no knowledge of the use of a prism. Other instruments had their natural effect upon the portrait. A mirror reflected it and an opera-glass brought it nearer to view. If the glass was inverted it was projected to a greater distance. But the remarkable fact was observed that no finer details were revealed than could be seen with the naked eye. It was only the general characteristics that were reflected or enlarged by the use of instruments.

Everybody knows that even the most ordinary hypnotic subject will be nauseated when told he is drinking ink and invigorated when told he is drinking lemonade. But the same thing is true in a less

degree of us all. If a person thoroughly believes that a glass of pure water has been sweetened, it will be sweet to his taste, and a rod held in his hand will be hot to his touch if he believes it has been heated. A good illustration of the power of a dominant idea in ordinary wakefulness is a case cited by Dr. Carpenter. A procurator known to him had a coffin exhumed to ascertain the cause of the death of the person buried in it. While waiting for the examiners to open the coffin the procurator fainted away because of the strong odour of decomposition. After he had been removed from the room the coffin was opened and found to be entirely empty. It had never been used for any corpse whatever. "When we have paid the faithless plumber," says another, "for pretending to mend our drains, the intellect inhibits the nose from perceiving the same unaltered odour till perhaps several days go by." If tradition is to be relied upon in the matter, Martin Luther repeatedly saw the devil, and Benvenuto Cellini the holy Virgin Mary. Pascal tells us that he often saw a fiery gulf open at his side, and many others have had like visions. The explanation of all these and similar experiences is not found in denying the reality of the sensations, but in their false interpretation. When an object or event is constantly and strongly expected, the mind easily conceives of it as already at hand. It "creates" the sensation and then gives it a local habitation and a name. This is the reason why we can all be so easily deceived by the illusions of the theatre or the sleight-of-hand performances of the skilled magician.

When the feelings of hope or fear are also aroused the most familiar experiences may give rise to perceptions of the most alarming sort. "Ordinary noises become the footfall of burglars, a harmless bush in a graveyard is a spirit, slight bodily pains are made the symptoms of frightful diseases." Romanes, in his *Mental Evolution in Animals*, tells us of his disgust at the fact that he often while out hunting shot a thrush mistaking it for a woodcock, but he found that such mistakes are very common among sportsmen. James in commenting upon these and similar experiences of his own says:

"Any one waiting in a dark place and expecting or fearing strongly a certain object will interpret any abrupt sensation to mean that object's presence. The boy playing 'I spy,' the criminal skulking from his pursuers, the superstitious person hurrying through the woods or past the churchyard at midnight, the man lost in the woods, the girl who tremulously has made an evening appointment with her swain, all are subject to illusions of sight and sound which make their hearts beat till they are expelled. Twenty times a day the lover perambulating the streets with his preoccupied fancy will think he perceives his idol's bonnet before him."

The hallucinations of a person suffering from delirium tremens are simply exaggerated forms of what is happening to him every day. The snakes and terrible monsters that torment him are just as real to him as anything that his eyes have ever beheld in the past. His sensations of sight are just as genuine

as any sensations ever were. He has simply misinterpreted them and come to a wrong conclusion as to their cause. From the standpoint of hallucinations of perception the only criterion we have to go by in deciding who is sane and who is insane is the frequency and persistence of the hallucinations. We cannot say of any adult mind that it is in normal possession of its powers unless its hallucinations are the exception rather than the rule and unless it allows appropriate evidence to dispel them when brought to view.

But not only is every normal mind subject more or less to hallucinations in perception, but the same thing is also true in regard to memory. For representation is only presentation over again with a less degree of intensity and what may happen in the latter case may also happen in the former. Strictly speaking, memory and perception are inseparably connected. No complete act of perception can take place without memory and no memory can occur without a previous perception. If we had in consciousness only the sensation of the moment and did not call up some past sensations to put along with it we would never be in a condition to perceive anything at all.

Ribot has written an able work on *Diseases of Memory* in which many cases are cited of hallucination of memory, but hallucinations of this kind are not uncommon where there is no disease whatever. Not long ago a gentleman of unimpeachable veracity swore in court that he locked a certain door on a certain important occasion and would not modify

his statement, although two equally reliable gentlemen who were watching him swore that he did not lock it. He was as certain of it as of anything he ever did in his life. The explanation is that he intended to lock it and he put as much mental energy into the determination as he would have expended if he had actually locked it. When he came to think the matter over afterward he was sure that he remembered the act.

Every one who has much to do with the examination of witnesses in court ceases to be surprised at their disagreement as to important details and in many cases even at their absolute contradictions. For everybody is limited in what he can remember and has to imagine the missing links just as he is limited in what he can perceive. Furthermore, we often remember merely what we want to remember just as we perceive what we want to perceive. Even when the missing links are filled in with the plain intention to deceive they may easily be repeated so often as to be finally remembered as realities. A story originally "made out of whole cloth" may come to be recollected as a genuine experience. Undoubtedly a large part of what we think we remember of our childhood is simply a mass of stories that we heard frequently repeated by our parents and friends, and another large portion is due to the more or less conscious effort to surround certain epochs in our past with suitable details.

It is only when this tendency to hallucinations regarding the past becomes overpowering and assimilates everything else that occurs in the mental

life to itself that we can justly take it as a test of insanity. An excellent example of such a case is that of a woman reported by Baldwin who has come to identify herself so completely with Martha Washington that she gives detailed accounts of many incidents in her husband's life that she has witnessed, calls her visitors by the names of his contemporaries, and exhibits necklaces and other presents that he presented to her before his death. This delusion has crowded out all remembrance of her own real past.

Perhaps no hallucinations of memory are more frequent than those connected with the re-localisation of self. An act of memory is not completed until we put ourselves back in the time and place of the first experience. This is always a difficult thing to do. Every one has doubtless had the curious feeling of familiarity with his surroundings when he knew from other considerations that he had never been in those surroundings before. Plato explains this feeling on the theory that it is simply a reminiscence of what was known to us in a previous state of existence. Many would explain it to-day on the theory of race-experience: that it was an actual scene in the life of our ancestors treasured up in our organism and by our own act of memory again brought to view. While there is probably much truth in this position it is undoubtedly the case that most of these and similar experiences are chiefly accounted for by the fact that what occurs in our wakeful states is often inseparably confused with our dreams.

Paul Radestock, a well-known writer on this sub-

ject, in his work *Schlaf und Traum*, gives us a record of some experiments on himself bearing on this point.

“When I have been taking a walk,” he says, “with my thoughts quite unfettered, the idea has often occurred to me that I had seen, heard, or thought of this or that thing once before without being able to recall when, where, and in what circumstances. This happened at the time when, with a view to the publication of the present work, I was in the habit of keeping an exact record of my dreams. Consequently, I was able to turn to this after these impressions, and on so doing I generally found the conjecture confirmed that I had previously dreamt something like it.”

Sully, in commenting on this record in his work on Illusions, rightly says:

“If, as we have found some of the best authorities saying, we are, when asleep, always dreaming more or less distinctly, and if, as we know, dreaming is a continual process of transformation of our waking impressions in new combinations, it is not surprising that our dreams should sometimes take the form of forecasts of our waking life, and that consequently objects and scenes of this life never before seen should now and again wear a familiar look.”

Inasmuch as all our dream-experiences are hallucinations and nothing but hallucinations, constant fusion with our wakeful states cannot help resulting in numerous falsifications of our past history. What we read in novels as well as what we hear from others is also frequently woven into the

one continuous series of conscious experiences that we all regard as making up our past lives. How much of what we come to consider as ours in the past is real and how much is hallucination we can never determine. Hence we can never settle with certainty what our actual part has been in the past. It can never be a matter of immediate recollection but only of inference and "imaginative conjecture."

Our sense of personal identity and personal continuity undergoes a shock, to say the least, when we come to know the facts, if we have ever supposed that it rested on a clear consciousness of our exact position in time and place in space when recalling our past. "A kind of sham self" is always more or less mixed up with our true self in every attempt to picture a remote event, and we can never be sure that the sham self has not played the greater rôle in determining our present state of consciousness concerning it. It is exceedingly humiliating to find out how much we all tend to exaggerate our importance when any chance for doing it comes up to view.

And now we come to consider the hallucinations of reflective thought. If the objective reality of the material we have to reflect upon is uncertain, much more must be the conclusions obtained from it. Sense perception and memory furnish the material and we have already seen how easily they may lead us astray. Strictly speaking, every fallacy is an hallucination. It is a failure to regard things as they are, a failure to put them together into their real relations. And these failures may arise in a great variety of ways.

It is customary in works on logic to divide all fallacies into two main divisions, material fallacies and logical fallacies, and then to subdivide them according to the special plan of treatment that the individual author sees fit to adopt. It is not our present purpose to investigate the general subject of fallacies, but simply to point out the fact that they are all a species of illusions or hallucinations. For they are merely misinterpretations of experiences and that is precisely what all hallucinations are. The only way for any thinker to avoid the charge that he is liable to hallucinations in his conclusions is to establish the position that he never makes a mistake in his reasoning but has infallible powers. As no one is likely to succeed in this endeavour we must admit that the field of possible hallucinations is co-extensive with all science.

While the right understanding of the origin and nature of hallucinations is of great help in the ordinary affairs of every individual, it is of special importance to those who in any way have to do with the guidance of others. A teacher of young children, through ignorance of this subject, may do more harm in a few weeks to their tender and immature powers than years of subsequent training can counteract. For example, severe punishments for lying where no lie was intended may be inflicted with the result that the child gives up all effort to tell the truth or at least doubts his ability to do it even if he tries. A physician who is uninformed on this matter is unworthy of trust. He may any time be the means of sending a person to a lunatic asylum

who has no more reason for being there than he has himself. (And a lawyer who fails to acquaint himself with these well-established psychological facts has no secure basis upon which to examine witnesses or estimate the value of evidence.)

But it is to the teacher of religion that a proper understanding of this subject is of the greatest moment. For it is chiefly in matters of religion that hallucinations most abound.) The census of hallucinations carried out by the Society for Psychical Research gives ample evidence of this fact. Superstition in all its forms is based upon them, from the fetish worship of the untutored savage to the so-called visitations of the Christian saint. All savage races and many nations considerably advanced in civilisation people the world about them with innumerable spirits that must be propitiated by sacrifices and gifts, or controlled by magic. While the spirits of ancestors and little children are generally regarded as benevolently inclined, most of these spectral forms are thought of as malignant beings whose plots and machinations must be thwarted at whatever cost. Hence arise human sacrifices and licentious rites of the most degrading sort. A very large part of the sin and misery of heathendom is due to the terrors that these monsters of the fancy continually excite.

They have also had and still have a powerful influence in all so-called civilised lands. Witchcraft, or the belief that certain cunning persons can communicate with these malignant supernal powers and extort their secrets and obtain their aid, was for

centuries the nightmare of Christendom. The most ordinary everyday experiences were interpreted as proof of the possession of this power. The early Church did not question its reality and attributed all the wonders of the heathen religions expressly to its activity. With the conversion of the Germanic nations a great number of new spirits were introduced and the term witch (Witega) is derived from this source. The theology of Thomas Aquinas in the thirteenth century greatly revived this belief; for the symmetry of his system seemed to require that Satan should have at least as numerous and ardent a following on this earth as was found in the ranks of the faithful.

The papal bull of 1484 gave free scope to witch hunters and admitted their worst charges. After the distraction of the Reformation had subsided the persecution of witches broke out with redoubled fury in all Christian lands, Catholic and Protestant alike. Thousands were put to death even upon their own confession. A single judge in Lorraine boasted in the height of his activity that he had already disposed of nine hundred. Not only were old women executed and those whom they named as their accomplices, but young men and women in the prime of life and even little children, three, four, and seven years of age. In Scotland witch hunting reached almost as great a degree of severity as on the Continent, and in Salem, Massachusetts, in 1691-2, under the influence of Cotton Mather's Book on *Memorable Providences*, it became a panic. Even down to the time of John Wesley, so deeply

rooted were these hallucinations and so essential were they considered to be to true religion, that Wesley wrote in 1768 to a friend: "The giving up of witchcraft is in effect giving up the Bible." Witches were judicially burned in Mexico as late as 1873.

Closely allied to witchcraft is the hallucination of demonology which is even now current among the masses in all lands. The term demon is of Greek origin, and was at first applied to the Supreme Being. Later it was used to designate any guardian divinity that was supposed to preside over the affairs of men. Socrates is said to have been attended by such a being, but probably all he meant by the "sign" or "voice" that controlled his action was some kind of a divine intimation. Plato undoubtedly believed in the real existence of demons, and he expressly says, "intercourse between gods and men is carried on by demons." Later, demons came to be regarded as evil spirits and they are so regarded in the Scriptures. Beelzebub is called the prince of demons. In the early Christian Church belief in demoniacal possession was universal and it soon became an important dogma that every child born into the world was under the control of an evil spirit. Hence arose the custom of using a formula of exorcism before the baptismal formula, as the Roman and Greek Churches do in our day.

[At no period in previous history was the sway of hallucination more general perhaps than at the time of the Reformation.] The movement headed by Luther made the discussion of religion common to

all. Other themes were forced into the background and nearly every mental experience was regarded from the standpoint of its relation to unseen powers. Books on sorcery, magic, necromancy, theosophy, and all forms of occult philosophy which before had been printed in Latin only and kept for the learned, were translated into the vernacular and sent broadcast, so that "everybody," as another puts it, "could raise the devil in his own tongue." In our own day works on these and related subjects have greatly multiplied and the avidity with which they are purchased and discussed is one of the extraordinary facts of history. Beyond all doubt they have a powerful hold upon large numbers of people even in the most highly civilised quarters of the globe.

As the teachings of modern psychology become better known these misinterpretations of our mental experiences will gradually disappear. For a correct conception of the origin and nature of hallucinations points out the way for their detection and cure. Hallucinations are based on facts just as truly as any of our other experiences. They are just as normal as anything else in our experience. They are simply misjudgments as to what certain facts signify. At the beginning of our mental life nearly all, if not all, of our attempts to interpret our experiences result in misinterpretations. We have to learn by repeated failures how to come nearer and nearer to the truth. It is only by long-continued experience and observation that our judgments can be made sufficiently reliable even for the needs of everyday life. At our

very best, all our dream experiences are hallucinations and almost everybody is dreaming to some extent most of the time even when awake.

[The only way to detect hallucinations and supplant them with well-authenticated facts is by the cultivation of the reasoning powers. Misinterpretations can be set aside only by correct interpretations and correct interpretations depend upon good judgment. One of the prime objects of education is to cultivate the power of judgment. If hallucinations dominate the whole life, if the judgment and will cannot be cultivated so as to keep them in the background, the condition is hopeless. Either the being is a confirmed lunatic or an incorrigible idiot. The normal healthy development of all our powers, both physical and mental, but especially of the power of correct interpretation, will gradually bring us to just the opposite condition, when we shall see things, at least far more clearly than we now do, as they are.)

CHAPTER V

THE CONDITION OF THE MIND IN SLEEP

IT is surprising, when we stop to reflect upon it, how much of our brief sojourn upon this planet is devoted to sleep. At the outset of our existence almost every moment is spent in sleep, and at the very climax of our powers from one third to one half of our time must be given up to it. Dr. Cyrus Edson in a recent paper on "The Hygiene of Sleep" (*The Cosmopolitan*, October, 1900), says that

"the infant during its first six months of life should not sleep less than about twenty hours; this period should be gradually lessened until the second year of life when the time for sleep should be about seventeen hours daily. Between the second and third years the sleeping period may be gradually lessened to fifteen hours; between the third and fourth years to fourteen hours; between the fourth and sixth years, to thirteen hours; between the sixth and ninth, to twelve hours; between the ninth and tenth years, to ten hours. During the critical period between the ages of thirteen and sixteen at least ten hours should be spent in sleep."

Thus we see that it is only after adult life has been fully established that the daily sleeping period can

safely be reduced to eight or nine hours, and then only during the continuance of a good degree of general healthfulness. Let any real injury befall the bodily organism and we immediately revert to sleep. The whole structure goes to pieces if we do not give ourselves up to it. Even a slight change in the condition of the air, a monotonous sound, a dull sermon or lecture, may at any time induce an irresistible tendency to sleep.

The great majority of the lower animals are wrapped in sleep most of the time and not much more than half awake the rest of the time. No human being is ever absolutely awake. The best one can do is to vibrate between deep sleep and high or low degrees of wakefulness. If we had to decide the question as to which was the normal condition, sleep or wakefulness, we certainly would have to decide in favour of sleep as regards the lower animals, and probably as regards the vast majority of men. Some think that if it had not been for hunger we should never have waked up at all.

In spite of the fact that every human being from the time of Adam has known by constant experience what sleep is, nobody has yet been able to explain it in a satisfactory manner. The best informed physiologists do not attempt to define it. They readily admit that they can tell us but little about how it arises, about the state of the body during its continuance, or how it produces its various effects.

The first person to make any careful researches into the condition of the brain during sleep was Mr. Arthur Durham. In 1860 he made some experi-

ments upon a dog, which throw considerable light upon the subject. After having chloroformed the animal he removed a portion of the skull about the size of a twenty-five-cent piece. He then inserted a watch crystal into the opening in such a manner as to leave a considerable portion of the brain exposed to view. He found that when the dog waked up and began to move about, the veins of this opening were greatly distended with blood and that many veins too small to be seen when the dog was asleep became distinctly visible.

From this experiment Durham very naturally drew the conclusion that pressure of distended veins upon the brain is not, as was then generally supposed, the cause of sleep; but, on the contrary, the brain in sleep is in a comparatively bloodless condition, not only the amount of blood being greatly diminished, but also the rapidity of its circulation. Durham also found that the amount of blood in the stomach and the extremities is increased during sleep, and he established the position that under all ordinary conditions whatever tends to increase the flow of blood to the cerebrum tends to increase wakefulness; and conversely, whatever tends to lessen the activity of the cerebral circulation tends to induce sleep.

These observations of Durham have been abundantly confirmed by the more elaborate experiments of such investigators as Dr. W. A. Hammond, Dr. Weir Mitchell, Ehrmann, Frank, Mosso, and others. Mosso's experiments were made upon a woman thirty-seven years of age, a man about as old, and

a child of twelve years, all of whom had lost by accident a portion of the cranium, leaving exposed a soft pulsating cicatrix or scar. Mosso also showed that there are frequent adjustments in the distribution of the blood during ordinary sleep. When a strong stimulus was applied to the skin or to any of the sense organs of the sleeper, but not strong enough to awake him, the flow of blood to the brain was increased and the beating of the heart materially quickened. All of these positions are corroborated by the experiments of Dr. J. Hughling Jackson on the condition of the retina during sleep. By the use of the ophthalmoscope he found the optic disk to be whiter, the arteries smaller, and the retina generally more bloodless in sleep than in wakefulness.

These facts, while universally admitted by physiologists, do not enable them to answer the question why a bloodless condition of the brain should favour sleep. The experiments made by Helmholtz show that the amount of heat produced by the average person when asleep is about one third of the amount produced when awake. It has also been noted that the quantity of carbonic acid eliminated is greatly reduced in sleep. This is largely accounted for by the quiescent condition of the muscles of locomotion and the reduced molecular changes in the tissues of the body that take place in sleep. It is easy enough to say in view of these facts that the cause of sleep is the exhaustion of the nervous system, but that does not shed much light on the precise changes which result in the apparent loss of consciousness.

Since the exertion of muscle is attended by the accumulation of certain lactates it has been argued that these interfere with the activity of the nerves and thus produce sleep. But experiment has shown that their injection into the blood does not induce sleep. It has also been maintained that sleep is due to a lack of oxygen in the brain. When we are awake, it is said, the vital processes soon use up the supply of oxygen and the grey matter of the brain suffers collapse in consequence. Sleep is thus a sort of cerebral asphyxiation. There may be some truth in this view, but the facts are as yet too meagre to justify its acceptance as the true one. It may be that, as all the tissues of the body are exhausted by work, all parts of the body have something to do with the phenomenon of sleep.

All admit that ordinary sleep is attended by a diminished activity of some of the nerve-centres of the brain and of the spinal cord. The centres of reflex action are also partially inactive and even those connected with the processes absolutely essential to life, such as the action of the heart and lungs, are more or less in repose during profound sleep, as the experiments of Mosso plainly indicate.

Periodicity is another observed fact connected with the physiology of sleep. Rest alternates with work in all the vital processes. Time must be given for the renewal of the energy expended in wakefulness. Even the heart rests in the short intervals between its individual beats. The cells in a secreting gland have regular periods of comparative inaction. So it is with the nervous system of the body.

Periods of sleep naturally alternate every twenty-four hours with periods of wakefulness. There are of course occasional exceptions to this rule. The Scottish philosopher Reid was able for a long period to sleep and eat enough at one time to last for two days. Nurses often work continuously for weeks, taking naps of only two or three hours daily. But sooner or later nature asserts herself and a long period of sleep becomes necessary in order thoroughly to recuperate the waning powers.

There are also numerous cases on record where sleep has been prolonged for weeks or months. Blanchet, a French physician, tells us of a lady aged twenty-four years who had slept forty consecutive days when she was eighteen years old, fifty days when she was twenty years old, and from Easter Sunday, 1862, to March, 1863, nearly an entire year. During this period she was motionless and insensible. Her pulse was low and her breathing scarcely perceptible. Her only food was milk and soup. There were no evacuations, no wasting away, and her complexion remained florid and healthy during the whole period. But this was a case of coma and not of ordinary sleep. Equally striking instances have occurred of prolonged wakefulness.

The occurrence of sleep at night is more largely a matter of convenience and habit than of necessity. The darkness and stillness of night favour sleep, but there does not seem to be any vital connection between the diurnal changes of day and night and the changes in the nervous energy of the body. Many of the lower animals habitually sleep during the day

and search for their food during the night. Many hibernate for months at a time during the winter, and persons whose occupations necessitate that they should work at night and sleep by day easily adapt themselves to the requirement.

Cabanis has attempted to show that there is a natural and regular order in which our senses fall asleep. First, the sight becomes quiescent, he says, and then the sense of taste. After that the sense of smell and the sense of hearing. Last of all the sense of touch. The order of awaking is not according to him the reverse of this order. For while the touch is most easily aroused, at least at the more sensitive parts of the body, the hearing comes next in order and the sight third, the senses of taste and smell coming the very last. More careful observations greatly modify this view. It is probable that no two times of going to sleep or of awaking are precisely alike in any individual. The senses undoubtedly fall asleep at different times in different degrees and awake in unlike proportions. One sense may fall asleep while all the others are active and several senses may be asleep while one alone is performing its usual functions. Soldiers often sleep on the line of march in all their powers except the muscles of the leg which still keep up the required movement. Sailors sleep clinging to the rigging in a similar manner. Sir William Hamilton vouches for the fact that when he was a student in the University of Halle a postman there who carried the mail to a village some eight miles distant used to go to sleep after leaving Halle, keeping the right road

and waking up at the little bridge he had to cross just before reaching the end of his journey. It is said of Sir Edward Codrington that when he was serving as a signal-lieutenant under Lord Hood no amount of shouting or beating upon drums would arouse him when asleep, but if the word "signal" was even whispered in his ear he would start up at once and immediately be ready for duty. Erasmus tells us that his friend Professor Oporinus of Basel once took a long journey with a distinguished bookseller, and just before they reached the inn where they were to pass the night an old manuscript in Sanskrit was found that so greatly interested the bookseller that he persuaded Oporinus to sit up and read it to him. The result was that the Professor fell asleep as to all his other powers, but kept on reading for a long time, not knowing, when he awoke, anything about what he had been doing. Noah Porter vouches for the fact that there are many persons who "can find refreshment in sleep when reading or conversation is going on, and be able to recite when awake what has been read or spoken while they were sleeping."

Such being some of the facts concerning the physiology of sleep we are now prepared to consider the condition of the mind in sleep. And the first thing we note is that there is abundance of evidence for holding that all the higher animals dream in sleep. Dogs show this by growling and barking in their sleep. Cows and sheep dream, especially while rearing their young. Bechstein tells us of the dream of a bullfinch which took on the character of a night-

mare, the bird falling from its perch. Canary birds sometimes faintly repeat their songs in their sleep and parrots have often been observed to rise on their perches in the night and prattle, though not half awake. These facts were observed by the ancients. Aristotle admitted that horses, oxen, sheep, goats, dogs, and all viviparous quadrupeds dream, but he had some doubts as to whether animals that lay eggs instead of producing their offspring alive do so. Darwin has no hesitation in saying in his *Descent of Man* that "dogs, cats, horses, and probably all the higher animals, even birds, as is stated on good authority, have vivid dreams, and this is shown by their movements and voice." Romanes freely expresses the same opinion in his *Mental Evolution in Animals* and gives many references to special investigators in its support.

That all men dream there can be no question; we only need to refer to our daily experience in confirmation of the fact. But it is also probably true that there is no such thing, in man at least, as dreamless sleep. It has been argued that all dreams occur just before going to sleep or just before waking. This may be true of our most vivid dreams, but it may easily be disproved of all dreaming by noting the successive changes of expression that are often visible in the countenances of the dreamers, and the more or less coherent talking that frequently takes place in sleep. In order to settle the question as to whether the mind is always active to some degree in sleep, Sir William Hamilton submitted himself to a number of experiments. It was always found that

when he was suddenly aroused from deep sleep he was dreaming, but what he was dreaming about was not always equally vivid. When aroused just as he was going to sleep he always found himself dreaming, and on reflection could trace his thoughts back to some external perception. The same results were obtained in experiments upon Professor Calderwood of Glasgow University, and would probably be confirmed in every other case where the person experimented upon had sufficient power of concentration to note carefully and describe what he experienced. We have already seen from the experiments of Mosso that the brain is never wholly inactive in sleep. Changes in the distribution of the blood are constantly taking place. It is also to be remembered that even if all the other senses were quiescent the entire surface of the skin is always sending impressions to the brain in the profoundest sleep. Thieves in India make constant use of this fact.

It has always been observed that as a rule we quickly forget our dreams. One of the reasons why we do this is that the act of awaking causes our dream thoughts to dissipate and our perceptions of the real objects by which we are constantly surrounded when we wake up is so much more vivid that the experiences of sleep are soon obliterated. How much would we remember of our thoughts by day if we should lie still all the time on a sofa with our ears stopped up and our eyes covered with a bandage? How many of us remember with distinctness more than a fraction of what passes through our minds in a single hour even when we are most

completely in conscious possession of our powers? That the mind constantly dreams in sleep, of course with varying degrees of intensity, is now admitted by most modern psychologists except those who hold that mental activity in all its forms is nothing but a passing phase of matter. This position is also confirmed by the teachings of a sound philosophy and it has been taught by the best thinkers from the time of Plato down to our own day. It is especially corroborated by modern scientific evolution, which teaches that just as sleep is the normal condition of all organisms and out of it come degrees of wakefulness, so dreaming is the normal condition of all minds and out of dreams are gradually evolved by some of the highest organisms definite thoughts.

Assuming then that to sleep is to dream, the definite problem we have before us is simply this: What is the condition of the mind in dreams? And in the first place we observe that we are always limited to the materials of our past experience in our dreams. In other words, we never dream about anything the elements of which have not in some way come within the realm of our past observation. That a person born blind never dreams of seeing is well established by competent investigators. Hundreds of cases were examined not long ago by Professor Jastrow in the asylums for the blind in and about Philadelphia, and in no instance was a person found blind from his birth who even in a dream believed that he saw. G. Stanley Hall says of the famous blind and deaf-mute Laura Bridgman: "Sight and hearing are as absent from her dreams as they are

from the dark and silent world which alone she knows." The same thing is probably true of Helen Keller. Many have undertaken to collect evidence concerning the dreams of persons born deaf, and all agree that they never dream about hearing, although they do sometimes dream about experiencing vibrations such as would come through the organism as a whole from the firing of a cannon, or the loud beating of a drum.

There is no exception to the rule that our dreams are always made up of those things that we have had something to do with in our past experience. This experience may long ago have faded out of our conscious memory, or may have been so slight as not to have been definitely remembered by the conscious ego at all; it may perhaps consist of traces left upon the brain by the deeds of our ancestors now many generations remote. But in some way or other it sets a limit to our mental activity beyond which we cannot pass.

One of the most striking peculiarities of the action of the mind in sleep is the little attention it pays to the relations of time and space. Dr. Carpenter in speaking of the condition of the mind in dreams well says: "All probabilities of time, place, and circumstance are violated; the dead pass before us as if alive and well; even the sages of antiquity hold personal converse with us; our friends upon the antipodes are brought upon the scene, or we ourselves are conveyed thither without the least perception of the intervening distance."

The number of scenes that may pass through the

mind of the dreamer in almost an instant is so large as to be well-nigh incapable of calculation. Count Lavalette tells us that one night, when he was imprisoned under sentence of death, he dreamed that he stood for five hours, at the corner of one of the streets of Paris, and witnessed a continuous succession of harrowing scenes of blood, every moment of the time teeming with excited feeling. In reality he was asleep less than two minutes. Many other cases have been recorded where a succession of events has passed through the mind of the dreamer and been regarded as years in transpiring, which must have been dreamed about in only a few seconds. The nearest analogy to this state in wakefulness is when one becomes aware that he is tottering on the brink of a precipice, or going down under the water for the last time. All the events of a lifetime seem at such a moment to present themselves to view. This lack of proper appreciation of time and space in dreams is largely due to the fact that the senses are not sending in their reports one after another in their usual manner, and the movements of external objects by which we are helped to measure time are not being attended to. The mind is absorbed in combining together the images and ideas which memory furnishes it out of the experiences of the past.

This leads us to observe that of all our mental powers fancy has the fullest play in sleep. Fancy is the mind's power for putting together past acquisitions into all sorts of haphazard relations without reference to any definite plan or purpose, and this

is the usual character of the products of our dreams. In this state or condition the mental energy is literally spent in giving to airy nothingness a local habitation and a name. People change their age, their sex, their country, their occupation, perhaps in one and the same dream, without thinking at all of the gross inconsistencies in the case, regarding it all merely as a matter of course. One observer tells us of a young lady who dreamed of seeing herself in her coffin and of listening to the observations of the mourners without any astonishment at finding herself dead, or after having died being able to hear. Nor was she surprised in her dream when she arose after the funeral was over and betook herself to her ordinary pursuits.

We accept in our dreams any incongruity as actual until we wake up and our better judgment shows us our mistake. Children and undeveloped adults live almost wholly in the realm of fancy; and for this reason they often have great difficulty in deciding whether a thing they are recalling actually occurred, or they only dreamed it. Old people often relapse into this condition. Cicero (*De Divinatione*, 59) remarks that if it were a law of nature that we should actually do in sleep all that we dream of doing every person would have to be tied to the bed before going to sleep. When sleep takes on the form of a nightmare the fancy runs riot over its products. The sensation of pressure upon the chest which usually accompanies this variety of dreaming gives rise to the most grotesque ideas. A Washington monument or a Brooklyn bridge is thought of as

resting upon the body making all movement or resistance impossible. Hence the cries of agonising distress. Only when the body is in some way aroused out of its lethargy will the mind give up its wild fancies for actual facts.

Another variety of dreaming is natural somnambulism in which the attempt is made to act out the dream. The term sleep-walking is applied to this form of activity because the act of walking in sleep attracts the more attention and excites the more alarm; but the term represents many other forms of activity in sleep, such as talking, singing, writing, playing on musical instruments, and the like. In somnambulism some of the senses are probably acting with surprising energy. Sometimes the sight is uncommonly acute and objects are distinctly seen in a light so faint as to be otherwise invisible. Occasionally the touch may be excited to a degree unknown in wakefulness, enabling one to perform extraordinary feats that he would not dare to attempt under other conditions. Sometimes the senses of smell and hearing are abnormally acute. Whatever sense is dominant, the dreamer makes its perceptions fit in with the phantasms of his dreams. Occasionally there results a highly rational product, though probably not much oftener than the law of chances would lead us to expect. As in all dreams the fancy is uppermost its products are regarded as realities and the whole being is thus put into strange and unnatural relations to the world of sense. If this state of mind becomes persistent instead of transient, the result is insanity, which in many of its

forms may be correctly described as a prolonged dream.

Another peculiarity about the mind in sleep is that the higher powers of imagination and reasoning are generally quiescent. There is rarely any invention in sleep. The mental energy being feeble in this condition, the mind easily exhausts itself in random associations of its material and does not have strength enough left to attempt to put things together in harmony with the laws of thought. Inasmuch as the products of the fancy are regarded as realities, no motive exists for attempting to reconstruct them and to separate the actual from the fantastic by comparing them with the permanent objects of actual life. The imagination is such a noble power of the mind that it requires all the conditions of wakefulness to create its ideals. Few persons, comparatively, even when quite wide awake, bring this faculty often into play. It is the chief organ of artists, poets, scientists, and philosophers, and their creations if worthy of the name are not those that spontaneously evolve themselves out of the conditions of a dream. Even so it is with the reasoning power. It can do nothing without the imagination. If the latter is absent or weak the former will be also.

While it is generally believed that most dreams come and go without involving any highly intellectual process, there are some apparent exceptions to this rule. Condorcet tells us that he saw in a dream the final steps of a difficult calculation which had greatly puzzled him during the day. Condillac says

he often finished in his sleep the treatment of subjects he had started just before retiring to rest. Coleridge describes in detail how he composed the *Kubla Khan* in a dream, and Tartini is said to have written his *Devil's Sonata* from materials that came to him in a dream, when the Devil appeared to him in person and challenged him to a test of his skill by first giving an exhibition of his own musical powers. Benjamin Franklin, according to Cabanis, often thought out in sleep the bearing of political events that baffled him when awake.

In all these cases it is probable that the dreaming, as Wundt expresses it, "is dovetailed in with waking." That is, it occurred just before falling asleep, or while in the process of waking, the powers as soon as they are relieved of external distractions, or when greatly refreshed after slumber, doing easily and quickly what before demanded prolonged and perhaps painful effort. It is probable that the same conditions prevail when we dream that we are dreaming,—a thing that occasionally happens. We are really half-way between actual sleep and ordinary wakefulness.

We have intentionally excluded here the famous dream of Scipio that we find so beautifully described in one of Cicero's chief writings (*De Divinatione*). For, like so many similar productions, it was probably not a dream at all. As one of the creations of Cicero depicting what a dream might be, it is worthy of his best effort. For lofty imagination and high thought he rarely surpassed it in the very climax of his powers.

Another observed fact about the mind in sleep is the almost complete absence of self-consciousness. The idea rarely comes to a dreamer that this is my thought or my feeling. Time is required in order to make this discrimination and the uprush of images in sleep is usually too rapid for one to think of himself. The entire energy is concentrated upon the kaleidoscopic changes that fancy is constantly unrolling for inspection. There is no time to reflect and hence no opportunity for a distinct apprehension of one's states as the states or experiences of an individual ego.

But perhaps the most noticeable thing about the condition of the mind in sleep is the almost complete suspension of free will. To such an extent is this the chief feature of dreaming that it is commonly defined as "an absence of voluntary control over the current of thought." Of course we are not asserting here that there is a suspension of all will in dreams. For we strive to express our ideas in sleep as truly as in wakefulness. When we dream of talking we actually do talk to some degree; when we dream of singing we sing to some degree; when we dream of running we run with some degree of rapidity. In other words, every thought in sleep or wakefulness is always attended in some degree by its corresponding muscular action. It was not this general capacity for action which everybody recognises as always present in dreams, but the capacity to direct our activities according to a rational purpose that Dugald Stewart had in mind when he asserted that "the circumstances which discriminate

dreaming from our wakeful thoughts are such as must necessarily arise from the suspension of the influence of the will.''

He is probably wrong, however, in holding that the suspension of the will is the cause of dreaming. It is rather one of the effects of sleep. When the vital and sensational activities predominate, as they necessarily do in sleep, the higher mental processes are kept in the background, if not shut out altogether. This is especially true of the higher act of will. Voluntary attention, instead of dominating the images that pour in upon the mind in dreams, is dominated by them. There is no chance for rational control. This is the chief reason why we regard our dreams as realities. We take what we experience just as it is given without being able to stop the flow of images long enough to compare them with those arising from our contact with the more permanent objects of the external world.

Here we see also why there is an absence of moral responsibility in our dreams. Responsibility involves choice. But where free will is lacking there can be no choice. Furthermore in dreams, as we have already seen, the conditions of a sound judgment on any subject are wanting. Not only is the relation of the mind to the external world constantly shifting and full of incongruities, but no clear connection is made by the mind with its own acts or states. In this chaos of ideas and feelings right judgments are impossible. No opportunity is present for determining what we ought to do or to be. It is for this reason that conscience does not trouble

us in our dreams, although when we awake we may be filled with the deepest shame and mortification at the recollection of our conduct. As another has well said: "We commit in dreams acts for which we should weep tears of blood if they were real, and yet never feel the slightest remorse. The familiar check of waking hours, 'I must not do it because it would be unjust or unkind,' never once seems to arrest us in the satisfaction of any whim which may blow about our wayward fancies."

A word as to the vividness of dreams. It is now generally admitted by physiologists that the brain as a whole is peculiarly excitable in sleep. While it is not open to so many impressions as in wakefulness, it responds with greater intensity of action to the few it does receive. This helps to account for the preternatural vividness that often attends our dream-life. A slight external or internal stimulus may arouse the mind to grossly exaggerated states of thought or feeling. Dr. Maury when having his assistant tickle his lips in sleep dreamed of suffering most horrible facial tortures. The same results attended his experiments upon the sense of hearing, taste, and smell. Dr. Gregory dreamed of walking up Mount Etna suffering intensely from the heat by having a bottle of hot water applied to his feet. Dr. Reid having had a blister applied to his feet dreamed of being scalped by the Indians. Aristotle calls attention to the fact that people can be made to dream of thunderstorms by simply making a slight noise in their ears when asleep. The extremely vivid visual images, or *schlummerbilder*, seen by

Julius Müller, Goethe, and others are probably to be accounted for in a similar manner.

The vividness that is sometimes given to our dreams may help us to understand why dreams have always had so much to do with religion. Anthropologists are now generally agreed that young children and savages make no distinction between their dream experiences and those of wakefulness. The former is as real to them as the latter. The persons and objects that appear to them in dreams are just as truly to be accounted for as those they come in contact with when awake. But as they know the difference between being awake and being asleep they naturally come to think of the world they visit in sleep as separated in some degree from the world of waking life. Thus arises very quickly the idea of a world of supernatural spirits with whom they are in more or less intimate relations. Hence the view held by all primitive races of the supernatural origin of dreams, a view which continues even when they have in many ways reached a considerable degree of intellectual development.

It was universally believed in ancient times that in dreams divine beings revealed their will, or some facts past or future that would be of great practical moment for mortals to know. Sometimes a messenger or angel came to the dreamer and announced the message. Sometimes the message was heard as if uttered by an external voice. On other occasions a vision of it was caused to pass before the dreamer, not always as distinctly objective but as something mysteriously impressed upon his mind. The oldest books in the world contain many references to

dreams and constantly refer to this conception of their origin. Homer distinctly declares that dreams are sent by the gods and goddesses and sometimes it would seem with a purpose to deceive. All the great men described by Herodotus believed that dreams were of supernatural origin. Socrates and Plato believed in such dreams and Aristotle thought they might occur. Such was the view of the ancient Romans. "In the *De Divinatione* of Cicero," says a high authority, "we have almost an unique instance among classic writers of a complete rejection of the supernatural origin of dreams." Cambyses assassinated his brother because of a warning he thought he received in a dream, and Xerxes invaded Greece for similar reasons. The ancient Hebrews no less than others regarded dreams as the vehicle of divine communications. The divine origin of dreams became in the time of the Fathers a doctrine of the Christian Church. In the Middle Ages, under influences partly Christian and partly pagan, dreams came to be referred to a great variety of supernatural agencies, not only God and the Devil, but fairies, fiends, and the like being the originators of dreams. Elaborate rules were developed among all the ancients for the interpretation of dreams, and those who became expert in the art were called prophets, diviners, or magicians. Among the Egyptians and Babylonians those who were appointed to interpret the dreams of the monarch were among the most important officers of state.

It is probable that physicians were the first to suspect the true view of the origin and nature of

dreams, through their study of the pathological conditions of the body. The Greek Hippocrates in the fifth century B.C., while recognising that some dreams may be divine, clearly attributes the mass of them to the influences of the mind upon the body. He was probably the first to point out that some dreams announce beforehand the conditions of the body,—a fact that physicians now include among the symptoms in making a complete diagnosis of a disease. For it is now a well-recognised fact that the state of the teeth, the stomach, the heart, the lungs, and other internal organs greatly affects the character of our dreams.

Modern psychologists and physiologists are now agreed that the phenomena of dreams are dependent on natural causes. All mental and physical events, while in no way similar, are so related that the existence of the one conditions the existence of the other. Dreams are no exception to this rule. They have their origin in the same laws of mind and matter as hold true in wakeful life. Nearly all organisms spend most of their mental energy in dreaming, just as they spend most of their physical energy in sleep or low degrees of wakefulness. While it may be said of every thinker that "there are more things in heaven and earth, Horatio, than are dreamed of in your philosophy," it is still true that dreams furnish the first materials of human knowledge. It is only by passing through the sleep and dream stage of development that we can rise to the exercise of the higher powers of the mind,—especially imagination, self-consciousness, and free will.

All great minds, as a rule, spend less time in sleep than persons of inferior power. Napoleon rarely slept over four or five hours out of twenty-four, unless he was meeting with reverses. After the battle of Aspern, his first defeat after seventeen victories, he is said to have slept continuously for thirty-six hours, to the great alarm of his friends. Goethe did not sleep as long as most men, nor did Humboldt, or Mirabeau. Jesus, from all we know about him, spent little time in sleep.

The abuse of sleep is just as possible and perhaps just as common as the abuse of alcohol. The people are few of whom it cannot be truthfully said that "now it is high time to awake out of sleep." Dr. Edson tells us that "it is erroneous to suppose that old age requires a greater period of sleep than adolescence or middle life." The tendency to drowsiness and dreaming so frequently noticed in elderly people, he thinks, should be combated rather than encouraged, as it hastens unnecessarily their physical and mental degeneration.

The more perfect the development of the brain, the more complete its adaptation to its environment, the less the friction and waste attending its exercise, and consequently the less sleep. Civilisation is the progress from sleep to wakefulness. The highest culture of which any human being is capable will be reached when the sleep and dream period is reduced to the minimum and the nobler activities of the soul are brought to the maximum of their efficiency and power.

CHAPTER VI

HYPNOTISM, ITS HISTORY AND PRESENT STATUS

HYPNOTISM, as the word itself literally signifies, is the state or condition of being lulled to sleep. In one form or another it has existed in all ages, even from the time when the first mother soothed her tired babe to rest by oft-repeated pats and the humming of some monotonous lullaby.

Very early in history certain persons who showed great facility in passing into this state came to be regarded as inspired, and what they said in this condition was looked upon as the utterance of a god. In ancient Egypt large numbers of women and children at certain great annual festivals often passed into this state and then it was said that the god Apis revealed through them the secrets of the universe. The phenomena of hypnotism were familiar to the Babylonians and belief in their supernatural origin was everywhere prevalent.

The priestess in the temple of Apollo at Delphi prepared herself for her tasks by first subjecting herself to long fasts and much mortification. Then she took her seat on the tripod placed over a deep chasm in the ground from which sulphurous vapours in large quantities constantly arose. This brought

on a state of hypnotism in which she poured forth sayings that were universally regarded as the oracles of a god. Among the ancient Israelites the witch of Endor played a similar rôle. She undoubtedly caused her devotees to believe that she endowed them with power to see the shades of their departed as truly as they ever saw them with the physical eye when alive.

The Greek and Roman sibyls in their hypnotic convulsions uttered prophecies of which, when awake, they had no conscious knowledge. For centuries Indian fakirs in large numbers have repeatedly put themselves into a condition in which they could, it is alleged, without pain, swing on hooks thrust through the naked flesh, lie down on a bed of spikes, hang suspended before a slow fire, hold their limbs in a given position until they became immovable, and do other marvellous feats that are impossible to man in his normal wakeful state.

After the introduction of Christianity it came about that all these phenomena were usually ascribed to evil spirits and those who passed into this hypnotic state were called witches. In the year 1600 A.D. it is estimated that there were about three hundred thousand witches in France alone, not to say anything about other parts of the globe. During the Middle Ages a hypnotic phenomenon that attracted much attention was the curing of certain diseases by the laying on of hands. Many kings and princes claimed to possess this power, but it was exercised by others in a much more extraordinary manner.

About the middle of the seventeenth century an Irishman by the name of Greatrakes, prompted by an alleged divine revelation, cured many cases of scrofula by the laying on of hands and afterwards succeeded equally well with fevers, dropsy, and the like. At one time he had, it is said, no less than ten thousand patients. Another great hypnotic healer, who appeared in Southern Germany about the middle of the eighteenth century, was a Catholic priest by the name of Joseph Gassner. Gassner believed that most diseases were due to demoniacal possession. In proof of this he first threw his patients into convulsions and then commanded the demon to depart. The power he exercised over a great multitude of people is almost beyond belief.

In our own day in the Orient it is no uncommon thing for a company of dervishes to sit down together in a circle and, amid the continuous beating of drums and the monotonous playing of castanets, by a series of swaying movements of the body, to get themselves into such a state that they can pierce their flesh with swords and daggers, swallow, it is asserted, small pieces of broken glass, and perform other similar feats without pain or apparent discomfort. This is their conception of religion, and they believe that by such rites as these they best prepare themselves for absorption into the Infinite.

But such performances are not confined to the Far East. Similar strange phenomena often occur in our own land. McMaster, in his *History of the People of the United States* (vol. ii., p. 578 *seq.*), referring to the so-called religious revivals in Kentucky

in the summer of 1800, tells us that the people of all denominations — Methodists, Baptists, Presbyterians, and Episcopalians—abandoned their work and homes and hurried in droves to the camp-grounds. Men, women, and children took part promiscuously in the praying and exhortation. These exercises were continued day and night for a week at a time almost without interruption. Hundreds of sinners fell daily motionless and speechless to the ground.

“At Cabin Creek,” he goes on to say, “so many fell that, lest the multitude should tread on them, they were carried to the meeting-house and laid in rows on the floor. At Cane Ridge the number was three thousand. . . . As the meetings grew more and more frequent,” he continues, “this nervous excitement assumed new and more terrible forms. One was known as jerking; another as the barking exercise; a third as the Holy Laugh. ‘The jerks’ began in the head and spread rapidly to the feet. The head would be thrown from side to side so swiftly that the features would be blotted out and the hair made to snap. When the body was affected the sufferer was hurled over hindrances that came in his way, and finally dashed on the ground to bounce about like a ball.

“At camp-meetings in the far South,” he tells us, “saplings were cut off breast-high and left for the people to jerk by. . . . Men dreamed dreams and saw visions, nay, fancied themselves dogs, went down on all fours, and barked until they grew hoarse. It was no uncommon sight to behold numbers of them gathered about a tree, barking, yelping, treeing the devil.”

Sir William Crookes, the President of the British Scientific Association for 1898-9, says of a well-known hypnotic operator by the name of Home with whom he experimented, that after several minor exhibitions of his power,

“Mr. Home again went to the fire, and after stirring the coal about with his hand, took out a red-hot piece nearly as big as an orange, and putting it on his right hand so as to almost completely enclose it, blew into the furnace thus extemporised until the lump of charcoal was nearly white-hot, and then drew my attention to the lambent flame which was flickering over the coal and licking round his fingers.” (*Proceedings of the Society for Psychical Research*, December, 1889, p. 103.)

Similar phenomena are vouched for by Lord Crawford, Lord Dunraven, and other witnesses equally competent (*Ibid.*, June, 1893, p. 165).

The first attempt to study these phenomena with any care was made by Dr. Friedrich Anton Mesmer, who received his degree from the University of Vienna in 1766, taking for the subject of his graduating thesis, “The Influence of the Planets on the Human Body.” He began his practice as a physician by the free use of magnets and attributed his remarkable success to their power. Soon he found, however, that the same effects could be produced without the magnets and he adopted the theory that there exists everywhere in all bodies a force that may be called animal magnetism which can be used as a cure with most beneficial results. “Through certain manipulations,” he says, “even simply by

merely a strong act of will, one can produce this power in persons, impart it to others, and cause the most marvellous and wholesome effects.'"

He communicated his views to various learned societies, but they either paid them no attention or declared them wholly untenable. He was expelled from Vienna in 1777 for the alleged cure of a blind girl, after an investigation by an imperial commission, and then he moved to Paris. There he soon made the acquaintance of Dr. Charles d'Eslon, who stood high in court circles, and who introduced him to the world of fashion. Almost at once all Paris became so fascinated by the new doctrine that Mesmer's parlours were crowded with patients. Subscriptions had to be made for treatment long in advance.

In order to have his patients quickly susceptible to this fluid, as he called it, Mesmer had his apartments dimly lighted and hung with mirrors. Strains of soft music occasionally broke the profound silence. The patients with their hands joined and with their waists connected by a common cord, sat around a large vat filled with various chemicals simmering over a slow fire, waiting with greatest expectancy the coming of their healer. When the excitement was at its height Mesmer would solemnly enter, clothed in the violet robe of a magician, holding in his hand an iron staff. He would majestically stroke one, gaze intently at another, and perform some mysterious passes before a third. Soon the whole company would be laughing or crying, whispering or shouting, standing up or rolling on the

floor, completely at the beck of the magnetiser. Every movement and every sensation and thought would seem to be absolutely subject to his will.

The whole French capital was thrown into the greatest excitement over the matter. The medical faculty of Paris denounced Mesmer in the most vigorous terms as a quack, but to no purpose. The government offered him an annual pension of twenty thousand francs for the secret of his power, but he declined to give it, chiefly for the reason, as afterwards appeared, that he had none to give. Finally a commission was appointed by the government, consisting of some of the most eminent physicians and scientific men of the day, to give the matter a thorough investigation. Benjamin Franklin and the famous chemist Lavoissier were members of this commission, and the cures were carefully studied. The elaborate report that was finally made summed up the matter as follows:

“On blindfolding those who seemed to be most susceptible to the influence all its ordinary effects were produced when nothing was done to them, but when they imagined they were magnetised; while none of its effects were produced when they were really magnetised, but imagined nothing was done; that when brought under a tree [one of Mesmer’s favourite modes of operating] nothing happened if the subjects of the experiment thought that they were at a distance from the tree, while they were immediately thrown into convulsions if they believed they were near the tree, although really at a distance from it; and that consequently the effects actually produced were produced purely by the imagination.”

This investigation, however, did not end the matter. Another commission of equal importance to the first was appointed which practically nullified the position taken above, and the whole affair was left about as it was at the outset. Neither commission denied the reality of the facts. They simply could not agree as to their explanation. At this time mesmeric societies or Harmonic Orders, as they were sometimes called, existed throughout France and the members numbered many thousand. But internal dissensions and the outbreak of the French Revolution caused them soon to disintegrate. Mesmer retired to England and finally to Meersburg in Germany, where he lived in obscurity till his death in 1815.

But one of Mesmer's most zealous pupils, a nobleman by the name of Puységur, continued the work in Paris with great vigour. He had so many patients that he could not treat them personally, and so he devised the scheme of magnetising a large elm tree on his estate near Soissons and letting the people have the benefit. Great multitudes, by getting under the tree, partook of its healing power.

Puységur was the first to claim that this so-called animal magnetism could greatly quicken the mental powers. He magnetised an ignorant labourer on his estate so that he knew almost as much at times as his employer. He found by experimenting upon many people that a large per cent. of them were much more keen and intelligent in this magnetic sleep than when awake.

This led to the theory that every person is en-

dowed with a so-called sixth sense, the organ of which is the whole nervous system. When the other senses are benumbed by magnetism this sense, it was claimed, can perform the function of all the others. In this way a person can be made to see and comprehend not only the condition of his own body, but also that of others. Usually this state was induced by passes and similar manipulations, but it could be brought on by the action of the will alone. In this form the doctrine had a strong following in all parts of the civilised world.

Although Elliotson was the first to introduce curative mesmerism into England and Dr. Esdaile did much to show its usefulness in surgery by his wonderful operations upon hypnotised Hindoos in the Calcutta Hospital, the first really scientific study of hypnotic phenomena was made by the celebrated Dr. James Braid of Manchester, England. In his book entitled *Neurypnology*, published in 1842, he gives us the results of his observations and personal experiments on the subject. He concludes that the phenomena in question are not due to any power transmitted from one individual to another by means of metallic disks, magnets, passes, or any other agent, but are to be traced to the brain of the subject acted on by suggestion, a principle long recognised by psychologists, but not elevated in his day to anything like its due prominence.

He found that he could produce all the phenomena of the magnetisers by simply helping the subject to concentrate all his attention for several minutes, if necessary, on some bright object like a

highly polished piece of silver or gold. If this were done, the eyelids would begin to droop and the subject would pass off into a more or less profound slumber. Hence, he classified all these phenomena under the term hypnotism, discarding the expression animal magnetism altogether.

In his experiments he found that hypnotic sleep is not always the same, but varies greatly from light dreaming to deep coma, in which there seems to be an utter loss of consciousness and will. He observed also that a change from one of these states to another could be brought about by blowing in the face of the subject and that he could be awakened in the same manner,—in general, that the subject would experience whatever he was told to experience by the operator in a commanding tone of voice.

Dr. Braid's experiments and theories did not at the time receive the attention they deserve, for other more sensational and semi-fraudulent performances absorbed the attention of the public. In America, Grimes's *Electrobiology* excited universal interest, and two brothers by the name of Davenport went over to England about 1850 and gained great notoriety as "biological professors." They hypnotised their subjects by having them gaze intently at a little disk of zinc and copper which was held in the hollow of the hand. Baron von Reichenbach, in Germany, came out about the same time with his alleged discovery of a new form of energy which he called odyllic force.

But the careful scientific study that the phenomena

of hypnotism have received in our day has resulted in the quite general opinion among the competent that Dr. Braid's position is the true one and that the principle of suggestion, or what Dr. Carpenter calls "the power of a dominant idea," lies at the basis of these abnormal forms of our mental life.

Some of the principal authorities on the subject at the present are, in France, Professor Charcot, the recent famous head of the great French hospital of La Salpêtrière, Professor Richet of the University of France, Professors Bernheim, Liebault, and Beaunis of the College of Nancy; in England, Professor Sidgwick of Cambridge, Professor Lodge of Liverpool, Professor Barrett of London, Edmund Gurney, Dr. Myers, and Frank Podmore; Obersteiner, Gessmann, and Moll in Germany; and Professors James, Hyslop, and Newbold in the United States.

It was formerly supposed that only weak and nervous persons were susceptible to hypnotism, but it is now generally admitted that almost anybody is susceptible to it, although the depth of the sleep varies with different individuals.

Liebault in France failed in only 27 out of 1011 cases and Wetterstrand of Sweden says in his well-known work on *Hypnotism and its Application to Practical Medicine* that "of 3148 persons I have hypnotised since January, 1887, but 97 failed to respond to my suggestion." Van Renterghem and Van Eeden in Holland in 414 cases had only 19 failures.

Many now deny that hysterical persons are as a

rule more easily hypnotised than others. At all events other forms of physical weakness do not appear to make any special difference. The chief thing is that there should be a willingness on the part of the subject and a power of concentrating the attention on the proposed sleep. It is not yet a settled question as to whether this willingness must always be present. There are some cases where hypnotisation seems to have taken place unconsciously and against the will of the subject, though it may be maintained that this opposition was overcome before the hypnotisation took place.

Age makes a great difference in regard to susceptibility to hypnotism, persons between seven and twenty-one being much the best subjects. In the mystic ceremonies of the ancients young people were almost always employed. Climate has considerable influence in the matter. Warm countries furnish the easier subjects and the tropics by far the greatest number. In general, anything that favours repose increases susceptibility to hypnotic influence. If a person has little power to pay attention or is absorbed in other thoughts, he will be hard to hypnotise. For this reason it is practically impossible to hypnotise an idiot and often very difficult to hypnotise an insane person. In spite of these exceptions, it is still true, as Sidis remarks in his *Psychology of Suggestion*, that "man is a suggestible animal, par excellence."

In regard to the means of producing hypnotic sleep, they are almost as various as the hypnotisers themselves. A crawfish can be hypnotised by any

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schoolboy by holding up its head and claws and gently stroking its bent tail. Hens have often been thrown into a cataleptic state by drawing a long straight chalk-line from their bills when held to the ground. Snake charmers tame serpents by staring at their eyes. In the same way snakes paralyse frogs and horse-tamers gain control over the most vicious brutes. This can be done also with human beings. The Hindoo fakir hypnotises himself by gazing intently and continuously at the pit of his stomach. It is possible for a person to hypnotise himself by staring at his own image in a mirror. The ancients made much use of mirrors and the glistening surface of water with this end in view.

Though the eye is made much use of, one may be hypnotised through any sense. Some persons respond most quickly to the monotonous sound of a gong or tom-tom or a tuning-fork. Others have been hypnotised through touch and a few through the sense of smell. Even a person in a deep natural sleep may be hypnotised by simply pressing for a moment or two upon the eyelids.

The ways of awakening a subject are as varied almost as the ways of putting him to sleep. A person may be de-hypnotised by blowing in the face, by opening the eyelids and blowing directly into the eyes, or by pressing upon some particularly sensitive part of the body. By using a screen one half of the body may be awakened, while the other half is left asleep, just as one half of the body can be hypnotised while the other half is left awake.

Much has been made of the different stages of

hypnotism, but it has been found that they are often not clearly marked and vary greatly with different persons. The three stages advocated by Charcot are known as the cataleptic, the lethargic, and the somnambulistic. The first stage is characterised by a loss of the power of motion due to a violent contraction of the muscles. The limbs remain in any position given by the operator, or may become perfectly rigid. It is often induced by sudden fright due to some such thing as the shriek of a locomotive, a clap of thunder, the unexpected sounding of a gong. Some persons on inhaling ether or chloroform pass at first into this state before reaching a narcotic condition. It is in this stage of hypnotism that persons are sometimes suspended between a couple of chairs by the neck and feet and then used to support heavy weights as though their bodies were made of wood or iron. This is a dangerous experiment, as the tetanus, or rigidity of muscles, may extend to the lungs and heart.

In the lethargic stage there is such a relaxation of the muscles as to result in a general collapse of the body. All the senses are usually inactive, though the hearing may sometimes be aroused by a speaking-tube placed in the ear. The state is usually induced by staring or by a gentle pressure on the eyeballs, although it may arise by transmission from the first stage by closing the eyelids, or from the third stage by pressure on the eyes. When the state of lethargy is fully realised the eyes remain closed or half-closed, and turned upwards and in-

wards. By opening one of the eyes the lethargic state may be immediately changed into the cataleptic for one half of the body and by opening both eyes the change may extend over the whole body.

The third or somnambulistic stage is the one that attracts the most attention. It is produced by any of the ordinary methods of hypnotising or from either of the other stages. Like the other stages it is characterised by insensibility to pain, but there is no abnormal irritability of the muscles. The eyes are generally closed. If, however, they are open in part there is no winking. Pressure on one of the eyelids may immediately cause semi-lethargy and on both eyes complete lethargy. The senses in this state are often quickened to a remarkable degree. Persons see, hear, smell, etc., with far greater acuteness than when awake. The mental powers in general are often so highly sharpened that the results seem almost incredible.

As has been already intimated, one half of the body may be hypnotised while the other half remains in its normal condition. For example, one eye may be made colour-blind, while the other has its normal sight. One side of the face may be made to laugh while the other cries, one hand to play a tune on a piano while the other lies helpless in the lap or at the side. The two halves of the body may be in different stages of hypnotism at one and the same time, so that pleasant things will be heard with one ear, and unpleasant with the other, a drop of water be sweet to one side of the tongue and bitter to the other. This is due to the fact that each half

of the brain, to a large extent at least, governs its separate half of the body, and that each half and apparently any portion of that half may be hypnotised without interfering with the normal action of the other half.

One of the most noticeable effects of hypnotism is on the memory. It may be made remarkably dull or remarkably active. It is generally true that a deeply hypnotised person remembers nothing when awake of what took place while in the hypnotic condition, but when he is hypnotised again he has a clear and vivid remembrance of all the details of the previous hypnotic condition. A second peculiarity of the hypnotic state regarding memory is that the subject often has a far more vivid recollection of past wakeful experiences than when in the usual normal state. Many things that could not be brought into consciousness at all even with the greatest effort stand out before the mind with extraordinary distinctness. Long-forgotten things are often as fresh and vivid as though they occurred but yesterday. Poems are repeated that cannot possibly be recalled when awake and even the ability to speak fluently in a foreign language may return when for years all conscious possession of the power has disappeared altogether.

Dr. Carpenter of London (*Mental Physiology*, p. 607) vouches for the fact that a hypnotised factory girl with no musical training whatever remembered and reproduced some of Jenny Lind's exquisite songs in different languages so correctly "as to both words and music that it was difficult to distinguish

the two voices." Jenny Lind herself assisted at the experiments.

Another fact about memory in hypnotism is that if a hypnotised person is told to remember when awake what was said and done while he was hypnotised, he can do it, but he cannot do it of his own accord. It is even possible for all memory, both of wakeful and hypnotic states, to be obliterated for quite a long period by the same method.

Some simple experiments illustrating these facts are given by Professor Beaunis. In his laboratory in Nancy he hypnotised a young lady and told her that on awaking she would see her friend with a nose of silver ten inches long. Immediately on awaking she burst out laughing at the sight and could not be persuaded that no such nose was visible to others. On hypnotising her again shortly after he told her the silver nose was gone. When awaking again she did not see it and had no recollection of ever having seen it or of hearing anything said about the subject. Another lady when hypnotised was told that in three minutes after awaking she would embrace a little peasant woman whom she had never seen before with great affection. She did so, but later had no recollection of the fact whatsoever.

A strange thing about these cases is that the memory becomes very distinct when next hypnotised. This shows that they are probably performed in a temporary state of somnambulism and that the wakefulness at that moment is only apparent.

A person by hypnotism may be made to forget any one or all the vowels of the alphabet, any

one or all the consonants, the nouns, or any of the other parts of speech, a portion of his own life, his own name, or any fact or set of facts; in short, as Björnström says, "it would seem to be as easy to benumb by suggestion a certain group of brain cells, as it is to paralyse a muscle."

The most striking fact about memory under the influence of hypnotism is its marvellous appreciation of time. If a hypnotised person is told to do a certain thing at a specified time in the future he will punctually perform it, though months or even years have elapsed since it was ordered and no conscious thought has been given to the matter during the interim. And when he does the deed he has no motive clearly in consciousness for the act, but seems to be impelled by an irresistible impulse. No suggestion from without will induce him, as in wakefulness, to do it. Nor will he do it before the time. The memory and the impulse come only at the appointed hour. There seems to be no doubt among students of this subject about the reality of this phenomenon, but no general agreement exists in explanation of it. A weak analogy to it in normal life is the ability of some persons to awaken themselves from ordinary sleep at an appointed hour, if they have fully determined to do so before the sleep was begun.

There is also in the hypnotic state an extraordinary development of the imagination and associative powers. The ability to be influenced by suggestion is so great in hypnotism that most authorities now hold that all hypnotism is due to it, the idea sug-

gested coming from without or from the mind's own powers. The ways of conveying the suggestion from without are as manifold as the ways of reaching the brain centres. But the usual way and the most convenient is through the spoken word. Whatever the operator declares to be true, the subject will regard as true, and act accordingly. The suggestion may also be communicated in writing through the eye, or through the sense of smell, or of taste, or of touch.

If a hypnotised person is told a piece of iron is hot it will be hot to him, no matter how cold it actually is; and if he is told that a quinine pill is sweet, it will be sweet, no matter how bitter it may be in reality. If a person is hypnotised for a few moments only and then told on awaking that he has been asleep for hours, he will have all the sensations that usually result from such a lapse of time when in a normal condition. A lady who had been hypnotised only for a few moments just after breakfast, about 9 A.M., when told it was 2 P.M. at once experienced sharp pangs of hunger and demanded her dinner.

Another interesting experiment bearing upon the laws of optics is that if a person when hypnotised is told to read a given inscription upon a slip of blank paper, he will do it and will see two inscriptions if a mirror is so placed as to give a reflection of the supposed writing. If the mirror is placed directly above the slip of blank paper, he will see the second inscription upside down just as he should according to the laws of reflected light. Professors Richet and

Féré after they had caused a subject to see a portrait on a white cardboard, photographed the cardboard, and the subject saw the same portrait on the photograph, but did not see it on the photograph of the other cardboards, apparently exactly like the one in question. The effects of an opera-glass or a microscope, in the hands of such a subject, is just the same upon these images as upon real ones, even if he has never used these instruments before or is entirely ignorant of their power. Yet they will not reveal to him any absolutely new details that were invisible to his naked eye before the instruments were applied.

The experiment of having a subject see a picture upon a perfectly blank card and then infallibly select that card from a large number exactly like it, after they have all been thoroughly shuffled together, is a very common one. The probable explanation of these phenomena is that the hypnotised subject associates what he sees with some spot or protuberance on the card that is unnoticed by people in the ordinary state of wakefulness.

Suggestion may be negative as well as positive. It is by the former that what is called psychic paralysis is produced. That is, a person may be hypnotised so as not to be able to see or feel the whole of any object but only a part. He may also be unable to perceive an object or person with any except a single sense. Two well-known experiments will illustrate this point. The first was performed by Beaunis and Liegeois. They hypnotised a lady in their laboratory in the presence of a number of

friends and told her that on awaking she would be unable to see or hear Beaunis, but would recognise him solely by the sense of touch. When she awoke she saw and conversed with all the others present, but all efforts to induce her to see or hear Beaunis, although he placed himself directly in front of her, proved of no avail. The moment he touched her, however, she responded at once.

The second experiment is reported by Binet and Feré. They conveyed the idea to a hypnotised subject that on awaking she could not see Feré, although she could hear and touch him. Such was the fact. She would stumble against him when he put himself in front of her and would hear his voice, but all the time he would be invisible. Some one put a hat on his head. She saw the hat, but thought it was suspended from the ceiling by a string. She did not see at all the wearer. When a coat was used instead of a hat, the effect was the same, and when Feré pinched any part of her body she would rub it and say it itched. If he stopped her from raising her arm she would say that she had a cramp.

The effects of negative suggestion may remain for months if not removed by the operator, and then it is only by degrees that the invisible object or person comes back into clear consciousness as out of a thick mist. It may produce an actual delirium where all rational judgment is suspended and the individual gives himself up to the wildest fancies. Such a condition has rightly been called a form of artificial insanity.

Any part or the whole of the motor apparatus

may be paralysed by negative suggestion, as Charcot and Bernheim have so abundantly proved. Numerous experiments show how easy it is to take away instantly the power to read, to write, to sing, to play on the piano, or to do anything else that requires the action of the muscles, and as great a variety of actions may be inhibited as there are possible combinations of the different muscles of the body.

One of the most interesting and important spheres of suggestion is the realm of organic life. It is proved beyond a doubt that the power of digestion, of nutrition, of circulation, and the like are greatly affected by it. Professors Liebault and Beaunis have often relieved such troubles as palpitation of the heart in this manner. They have also produced a raised swelling of the skin in this way and an actual blister such as is produced by a Spanish-fly plaster. The most famous of these experiments was made by them under the supervision of a number of French scientists in 1885. A young girl was hypnotised about 11 A.M. and some ordinary postage stamps were plastered on her back in imitation of a Spanish-fly plaster. Then she was told emphatically three times that a Spanish-fly plaster had been applied to her back and that she must go to bed and sleep till seven o'clock in the morning. She awoke punctually and the stamps were removed. The blister was forming, but not yet fully developed. At four o'clock the same day several blister spots appeared and fourteen days after they were still in full suppuration. A second Spanish-fly blister was

formed in the same way on the arm of this girl several days later.

Another girl was treated for neuralgia by suggestion and two blisters were formed, one below the left ear and the other on the left temple, each the size of a five-franc piece. It took forty-eight hours for these blisters to reach full development. The experiment of making a real Spanish-fly plaster ineffective was also attended with success, although it remained on the patient ten hours. Other physicians have produced actual blisters by using magnetised paper (as in the case of the Italian physician Louis Prejalmini) and other harmless substances.

Professor Bourru of Rochefort produced the phenomenon of blood perspiration in an hysterical man by writing the man's name on his arm with a blunt instrument and telling him in a loud voice that at 4 P.M. blood would be dripping from the letters of his name, and such was the fact. Other similar experiments were performed on the same patient and witnessed by several physicians. Charcot and his pupils have often produced real burns by suggestions, though the burns took several hours to develop.

These experiments show how the cases of stigmatisation are to be explained that have been so famous in history. It is a well-established fact that certain religious enthusiasts have been able to produce in their own bodies stigmata or wounds similar to those received by Jesus in connection with the crucifixion. One of the most recent and best attested cases of this sort is described by Dr. Carpenter in his *Mental Phy-*

siology. It is that of Louise Lateau. She was a young Belgian peasant girl who rapidly recovered from a severe illness after receiving the sacrament. This fact made so great an impression upon her and she dwelt so much upon the sufferings of Jesus in her behalf, that blood soon began to issue every Friday from a spot on her left side. A few months later hemorrhages also issued every Friday from similar spots on the front and back of each hand and on the upper surface of each foot, and even from a circle of spots on the forehead. The fits of ecstasy that accompanied these hemorrhages began about 9 A.M. and ended about 6 P.M., during which time the several scenes of the crucifixion passed vividly before her. The spasm reached its climax about 3 P.M., when she extended herself as nearly as possible in the form of a cross.

The effect of suggestion upon the flow of tears, the perspiration, and numerous other secretions is even more striking than upon the circulation, but there is no need of further illustrations of this sort. They are simply exaggerated examples of what is constantly occurring in a state of wakefulness. The chief thing to be kept in mind in regard to them all is that they are not cases of reflex action to be explained simply as operations of the body, but primarily cases of the power of the mind through suggestion to manipulate at its will the marvellously complicated mechanism of the brain, and make it do its bidding.

We have intentionally limited ourselves thus far to those phases of our subject which have to do with

the ordinary methods of transmitting the ideas and will of one person to another through the so-called five senses. There is, however, another phase of the subject which has to do with a group of phenomena that may well be put under the head of telepathy, or thought-transference, where ideas are said to be transmitted without the aid of any material medium as yet generally recognised by the science of our day. This aspect of hypnotism is now receiving the attention of some of the most carefully trained scientists of the world. The material they have collected and examined is so unique and the opinions they have expressed concerning it so important that the whole subject is considered by itself in another chapter. The same thing is also true of mind cure and kindred phenomena, treated at length in Chapter VIII.

We will conclude what we have here to say with some remarks on the educational and legal aspects of hypnotism together with some general cautions regarding its use.

One of the most eminent of recent experimenters on the effects of hypnotism upon idiotic and weak-minded children is Liebault. His results leave little doubt of its usefulness in almost every case. By one hypnotic seance he made a boy who was notoriously inattentive and unreliable in his work eventually much above the average in his class. Another boy who was actually an idiot and could not learn how to read or write, he so aroused by repeated hypnotic suggestion that in two months he could repeat the alphabet and add and subtract.

Another striking example of the use of hypnotism in correcting bad habits is given by Berillon. A boy eleven years of age had the habit from infancy, whether asleep or awake, of continually crowding the fingers of his left hand into his mouth, and no threats or entreaties or castigations could keep him from doing it. When the boy was brought to Berillon his nails were bitten off and his fingers were covered with thick swellings; his digestion was very much disorganised and his health greatly impaired. Berillon at once treated him by hypnotic suggestion and ordered him to go to sleep the next night without putting his fingers into his mouth at all. The order was repeated several times and then the boy was awakened. The next day the parents reported that to their great surprise the boy obeyed the order. When the boy was asked why he did not crowd his fingers into his mouth as usual, he replied that he continually felt the impulse to do so; but that he also felt that he could not do it if he tried. After several treatments of the same sort the impulse to return to the old habit disappeared altogether.

The application of hypnotic suggestion to such cases is now of everyday occurrence and the possible good that may come from a wise use of it is very great. It is altogether likely that thousands of defective and weak-minded children as well as adults will be developed in this way into normal characters, even after all other methods of treatment have failed to benefit them.

The legal questions that hypnotism has raised are

many and intricate and their importance will in all probability vastly increase in the immediate future. One of the most important of these questions is, Is a person likely to be injured physically and mentally by being thrown into the hypnotic state? In answering this question we must remember that all hypnotisation results from an artificially produced condition of the nervous system. However slight it may be it is a departure in some degree from the normal healthy state. It is for this reason that no one should allow himself to be hypnotised except for therapeutic or scientific purposes. If the hypnotisation is in the hands of competent physicians a normal healthy person may be hypnotised without noticeable evil results, the temporary irritation of the nervous system being checked before going to excess.

Dr. Myers in his late circular to the members of the Society for Psychological Research, entitled, *Hypnotism, its Conditions and Safeguards*, says that "the young men and boys on whom the Society for Psychological Research has conducted numerous experiments over a series of three (and in some cases of six) years, have always been and remain to this day in full health, physically and morally." These persons were in the hands of friends and thoroughly competent experimenters, but there are numerous cases on record where subjects of so-called professional hypnotisers have sunk into long-continued melancholia and even become permanently deranged. After a person in a normal healthy condition has once been hypnotised, the nervous system

tends to grow more sensitive and it may become so weakened as to be unable to resist even so slight a cause of hypnotisation as one's own image reflected in a glass.

Cases of what is called cross-mesmerism may also arise. This is the case of a subject coming under the influence of more than one person at the same time. In such instances violent physical contortions often arise and refuse to disappear at the suggestion or command of any one. It also happens that subjects are dismissed by inexperienced or careless operators before they are fully awake, thus rendering them liable to all the dangers that may come to a person only in half possession of his faculties.

It is well known that persons even in wakefulness may by suggestion do themselves great harm. In some well-authenticated instances it has resulted in the death of the person who gave himself up to it. Many cases are recorded where persons have died from taking what they supposed was a deadly poison, when in reality they had only swallowed some perfectly harmless powder. In a hypnotic condition the ability to be injured in a similar manner is increased many fold.

That a hypnotiser has the power to make his subject commit crimes of various sorts, there can be little doubt. Professor Liegeois, the famous professor of jurisprudence at Nancy already referred to above, has made some very instructive experiments upon this point. Among the cases he reported to the academy of the moral and political sciences is the following:

“ Mrs. O. is a young and very intelligent lady; she has received an excellent education; at first she energetically resisted all suggestion, but gradually yielded. I made her believe that she owed me one thousand francs and asked her for her note. She obstinately refused to give it and declared that she owed me nothing and that she would never acknowledge any debt to me. I insisted. She began to hesitate, she remembered it, acknowledged it before several witnesses, and wrote the note.”

The Professor afterwards made her give him a bond for one hundred thousand francs on account of her husband's indebtedness, though in fact he owed no one anything. He made another lady by suggestion acknowledge that she had killed her friend and give all the details before a justice of the peace, telling how she did it and where they would find the body.

The Professor also directed a young man to put a dose of arsenic that he prepared for him into a glass of water that he was to offer his aunt the next evening when she called for a drink. The attempt at poisoning was actually carried out. On another occasion he hypnotised a Mrs. G. and told her to shoot a certain magistrate with a revolver he gave her. Before doing so he discharged one of the chambers of the revolver at an object near by so that she could see that it was loaded. She did as she was told and thought that she killed her victim. She was immediately arrested and acknowledged her crime without hesitation. She could not be induced in any way to allow that anybody had suggested it to her.

It is possible by hypnotic suggestion to cause a

person to perjure himself, to steal, to commit almost any immorality, and then to be afflicted with amnesia or loss of memory regarding the whole matter. It is a fortunate thing with reference to these hypnotic crimes that they have rarely been committed outside of the laboratory of some experimenter. But they may occur in real life, and it becomes our courts, in this age when so great a strain is constantly being put upon the nervous system, not to leave this source of crime wholly out of view. We admit that it is not likely that any person whose morality is based on clearly recognised principles long applied will be induced to commit great crimes by hypnotic or post-hypnotic suggestion. It is claimed by some that no such cases have as yet been discovered. But there are in every community many persons whose regard for law and order is almost wholly based upon expediency or fear. In hypnotism such considerations would have little influence.

Enough is now known of the possibilities and dangers of hypnotism to make it evident that public hypnotic exhibitions should be prohibited in all civilised lands. Its entire control should be vested, so far as it is possible to vest it anywhere, in the hands of responsible physicians whose interests in the welfare of the community will tend to reduce to the minimum its perpetual abuse.

When Donato, one of the famous travelling hypnotisers of our day, was giving exhibitions in Turin many who attended his seances afterwards became seriously sick from nervous exhaustion and insomnia. Others could not help falling asleep at the

most inopportune moments. The physicians of the city protested vigorously against his performances and Professor Lombroso of the Turin University joined in the protest. In his report on the matter he collected many instances of its ill effects. The result was that Donato was expelled from Italy and a law passed prohibiting such exhibitions in the future.

Austria passed a similar law a little later, so much injury having been done throughout the empire by a Danish operator by the name of Hansen. Switzerland has similar regulations and so has Denmark. France until recently was the paradise of hypnotisers. The magnetic societies founded by Mesmer, which were swept away by the Revolution, were revived in full force after the downfall of Napoleon. In 1888 it was reported on good authority that there were in Paris alone five hundred somnambulistic cabinets, twenty periodicals devoted to the subject, hypnotic clinics almost without number, and over forty thousand followers. Recently, however, France has joined the other countries mentioned above in a general prohibition in public of everything of the sort. Russia is the latest country to legislate on the subject. In 1893 a decree was issued allowing physicians who had procured proper certificates of fitness to practise hypnotic methods for curing disease.

The only safe position to take in the matter from the standpoint of the law is to regard hypnotism as a poison and to prohibit its use in public or private except by properly accredited individuals and then

only for scientific ends or as a cure. Its use, like that of strychnia, belladonna, or chloroform, if in the hand of the physician, may become a great blessing, but if in that of others an unmitigated curse.

CHAPTER VII

THE MIND IN ITS RELATION TO DISEASE

EVERY sane person knows from his daily experience that even such organic movements as the inflation of the lungs, the circulation of the blood, and the digestion of food can be greatly impeded or quickened by a slight change in the current of his thoughts. For this reason very few people care to discuss the question as to the reality of the influence of the mind upon the body, but great interest has always existed in the inquiry as to how far this influence may extend and what benefits to the health and happiness of mankind may come from its intelligent application.

The subject has never received so much attention as at present and it is being investigated with a scientific accuracy that deserves the support and approval of all. The material that has been accumulated bearing upon the matter may conveniently be arranged under two heads: the facts showing that the mind can induce disease in the bodily organism, and the facts indicating that the mind can exert a powerful influence in checking disease, however it has been induced, and in many instances can dispel it altogether.

Our plan in this chapter will be to bring together from various sources a goodly number of well-authenticated cases bearing upon the two divisions of our subject, describing them essentially without comment. Then at the close we shall try to discover the general principle that underlies them all and that ought to be taken for granted in discussing any alleged evidence for the extraordinary healings of Christian Science and such other phenomena as the so-called miracles of Lourdes.

It has long been a well-attested fact of observation, abundantly confirmed by experiments upon men and animals, that the quantity of the secretions of the body are affected to an extraordinary degree by the state of mind of the subject at the time the secretions occur. A copious flow of the saliva may be induced by the sight or thought of savoury food as truly as by its actual presence. But this is also true of the quality. Anxiety of mind on the part of the mother has often been the cause of sickness and irritability among nursing children, and sometimes, indeed, of sudden death.

Among the many cases cited by Dr. Tuke in his well-known work on the *Influence of the Mind upon the Body* (pp. 307, 308), illustrative of this point, is the following reported by Dr. Kellogg, of Port Hope, Canada:

“A lady of a highly excitable temperament, a mother of three children and who had frequently been under the medical care of the writer, gave birth to her first male child about one year since. The child was healthy and

appeared to thrive well for four or five weeks. Its mother on first leaving the room was, as is frequently the case with careful housewives, somewhat excited and vexed with the condition of things in the kitchen, and the 'high life below stairs' which had evidently been led by the servants during her confinement. She was also excited on the same day by the arrival of some friends. In addition to this, after retiring to her room she heard the child next in years to the infant fall down a flight of stairs. She was much alarmed and had the child brought up to her room, screaming, with its nose bleeding and broken. She took it upon her lap, bathed its face, and after stanching the hemorrhage and quieting the child to sleep, she most imprudently and, though a highly intelligent person, ignorantly and innocently suffered the infant to nurse after this crowning excitement of the day. Its bowels became immediately deranged, the stools green, high fever and convulsions supervened, and the child died in great agony in less than three days with all the symptoms of violent inflammation of the bowels."

Dr. A. Combe, in his treatise on *The Management of Infancy*, also gives several instances where the mammary secretions have acquired an actually poisonous character due to violent mental excitement. A mother just recovering from a state of fright, he tells us, "took up her child from the cradle, where it lay playing and in most perfect health, never having had a moment's illness. She gave it the breast and in so doing sealed its fate. In a few minutes the infant left off sucking, became restless, panted, and sank dead upon its mother's bosom."

Many similar cases are reported from other sources. Dr. Carpenter, in his *Mental Physiology*, gives an instance from his own practice. A mother who a few moments before had heard of the sudden death of the infant child of an intimate friend took up her own child, nursed it, and laid it back in the cradle apparently in perfect health. Immediately it went into convulsions and expired. There is abundant evidence, he says, in commenting upon this case, "that a sudden and violent excitement of some depressing emotion, especially terror, may produce a severe and even a fatal disturbance of the organic functions, with general symptoms so strongly resembling those of sedative poisoning as to make it highly probable that the blood is directly affected by the emotional state through nervous agency."

A most remarkable case of external injury to the body due to great mental excitement and one often quoted in this connection is given by Dr. Carter in his *Pathology and Treatment of Hysteria* (p. 24). He describes it as follows:

"A lady who was watching her little child at play saw a heavy window sash fall upon its hand, cutting off three of the fingers; and she was so much overcome by fright and distress as to be unable to render it any assistance. A surgeon was speedily obtained who, having dressed the wounds, turned himself to the mother whom he found seated moaning and complaining of pain in her hand. On examination three fingers, corresponding to those injured in the child, were discovered to be swollen and inflamed, although they had ailed nothing prior to the

accident. In four-and-twenty hours incisions were made into them and pus was evacuated; sloughs were afterwards discharged and the wounds ultimately healed."

It is undoubtedly true that many persons are so sensitive even to the sight of a sprained ankle or a troublesome sore on the finger that they immediately experience severe pains in the corresponding parts of their own body, although there be no sign there whatever of any external injury. It is a well-known fact that medical students often faint away at the mere sight of blood when they witness their first surgical clinic, and it is not infrequently the case that they come to suffer from the very disease about which they are studying, even a picture of the diseased part being in some instances sufficient to begin the production of its symptoms. Dr. Goddard, of Clarke University, in his excellent paper on "Effects of Mind on Body," published in the *American Journal of Psychology* for April, 1899, tells us that one of the most prominent physicians in Chicago wrote him recently that on one occasion, after having worked a long time on a difficult case that had been given up by several other physicians, he discovered symptoms of duodenal catarrh that they had overlooked. And being very anxious to succeed in his treatment of this trouble with all its attendant complications he immediately after supper lay down on a couch to read a recent work on the subject. Soon he fell asleep from sheer exhaustion with his mind "full of the pathology, symptomatology, etiology, and treatment of such conditions. In two hours he awoke

with an intense duodenal catarrh that lasted several days before he could get it under control."

There is every reason to suppose that the wonderful cases of stigmatisation recorded in history have been produced in a similar manner. Among the most famous of these cases, with the exception perhaps of Louise Lateau, described in Chapter VI., is that of St. Francis of Assisi. By constant thought upon the physical suffering of Jesus it is asserted that he caused actual wounds to appear upon his own hands and side and feet very similar to those upon the body of Jesus. From what we now know of the possible effects of the mind upon the body we have little ground for maintaining that the phenomena in his case were unreal.

While the cases cited above are of course extraordinary and not likely often to occur, there is no denying the fact that there are many diseases that can be induced by mere power of thought. Some slight disagreeable sensation is at first fancied to be a sign of the disease and then the attention is so continuously concentrated upon it that it actually results in bringing on the malady. In this way epidemics of disease sometimes sweep over a community, even though the disease in question be not in itself of a contagious character. Manias of all sorts have had their origin in the power of a dominant idea. Such was the dancing mania that spread through the central part of Europe the latter part of the fourteenth century.

An oft-quoted description of it is given in Hecker's work on *Epidemics of the Middle Ages*:

“Where the disease was completely developed,” says Dr. Hecker, “the attack commenced with epileptic convulsions. Those affected fell to the ground senseless, panting and labouring for breath. They foamed at the mouth, and suddenly springing up began their dance amidst strange contortions. A few months after this dancing malady made its appearance at Aix-la-Chapelle, it broke out at Cologne, where the number of those possessed amounted to more than five hundred; and about the same time at Metz, the streets of which place are said to have been filled with eleven hundred dancers. Peasants left their ploughs, mechanics their workshops, housewives their domestic duties, to join the wild revels; and this rich commercial city became the scene of the most ruinous disorder. . . .

“The St. Vitus’s dance attacked people of all stations, especially those who led a sedentary life, such as shoemakers and tailors; but even the most robust peasants abandoned their labours in their fields, as if they were possessed by evil spirits; and those afflicted were seen assembling indiscriminately, from time to time, at certain appointed places, and, unless prevented by the lookers-on, continued to dance without intermission, until their very last breath was expended. Their fury and extravagance of demeanour so completely deprived them of their senses that many of them dashed their brains out against the walls and corners of buildings, or rushed headlong into rapid rivers, where they found a watery grave.”

In the fourteenth century the biting mania had a somewhat similar course. It broke out in the nunneries of Germany and spread even as far as Rome. Among savages manias of all sorts are unusually

common, the expectation that a particular malady will result from a particular word or gesture actually producing the malady itself. Among the negroes of the British West Indies it was found necessary to suppress what were known as obeah practises by stringent legislation. For many pined away and died from the belief that some old man or woman had put obi upon them from the evil effects of which it was impossible to escape.

Dr. Noble has recorded the following experience of a soldier in Napoleon's army by the name of Boutibonne, who was wounded at the battle of Wagram. About sunset, as he was reloading his musket, he was shot down by a cannon-ball, both legs, as he supposed, being taken from him. He lay motionless till morning, not daring to stir lest he should bleed to death. At early dawn a medical officer came to him to see if he could be of any service. The wounded man whispered that both his legs were gone and he could not hold out much longer. The doctor made an examination and assured him that his legs were uninjured. Almost immediately he leaped to his feet in utter amazement at the thought, grabbed up his musket, and hurried back to camp. All that had really happened to him was that a cannon-ball had carried away the ground underneath his feet and he had fallen into the trench that had been suddenly made by it.

Professor Bennett, of Edinburgh University, vouches for the following as having occurred within his personal knowledge:

“A butcher,” he says, “was brought into the shop of Mr. Macfarlan, the druggist (on North Bridge Street), from the market-place opposite, labouring under a terrible accident. The man on trying to hook up a heavy piece of meat above his head, slipped and the sharp hook penetrated his arm so that he was suspended by it. On being examined he was pale, almost pulseless, and expressed himself as suffering acute agony. The arm could not be moved without causing excessive pain; and in cutting off the sleeve, he frequently cried out; yet when the arm was exposed, it was found to be quite uninjured, the hook having only traversed the sleeve of his coat.”

There are a number of instances on record in which the influence of an excited state of mind upon the body has actually resulted in death. The following vouched for by Björnström are in point:

“Quite recently a medico-legal examination was made of a woman who was supposed to have shortened her life by poison. The investigation brought to light the fact that she had taken perfectly harmless insect-powder in the belief that it was a deadly poison, and as no other cause of death was found, it must be supposed that her imagination as to the efficiency of the powder caused her death.

“With the consent of Napoleon III., a scientist had a criminal tied to a table with his eyes blindfolded under pretext that he was going to open the man’s carotid artery and let him bleed to death. With a needle he made a slight scratch on the criminal’s neck and had water dropping into a vessel that stood beneath while all around an awful silence prevailed. The victim,

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believing that he heard his life-blood flowing away, died after six minutes.

“A horrible joke by some Scotch students produced the same result. A disagreeable janitor was one night lured into a room where he was solemnly tried and sentenced to death by decapitation. The terrified man was led into a corner and placed on a block beside which stood a sharp axe; after his eyes had been blindfolded he was given a blow on the neck with a wet towel, and when they lifted him up he was dead.”

Dr. J. M. Buckley, of New York, describes a similar case known to him as follows:

“A young man nineteen years of age, a student in a large seminary about sixty miles from New York, was strongly attached to a teacher. The teacher died to the great grief of the student. Sometime afterward the young man dreamed that the teacher appeared to him and notified him that he would die on a certain day and hour. He informed his mother and friends of the dream, and expressed a firm belief that when that time came he should die. The family considered it a delusion; and as no alarming change took place in his health, they were not worried. When the day arrived they noticed nothing unusual; but after dining and seeming to enjoy the meal and to be quite cheerful, he went to his room, lay down, and died without a struggle” (Article, “Dreams,” etc., *Century*, July, 1888).

Thus far we have considered only those facts which tend to show the power of the mind to cause disease in the bodily organism. We next need to direct our attention to a similar set of facts illustrat-

ing its power to mitigate or cure disease, however it may have been occasioned.

And in the first place we will consider some well-authenticated cases of the exertion of this power in ordinary wakefulness. Dr. Carpenter, writing about the famous English preacher, Robert Hall, says:

“Some of Robert Hall’s most eloquent discourses were poured forth whilst he was suffering under a bodily disorder which caused him to roll in agony on the floor when he descended from the pulpit; yet he was entirely unconscious of the irritation of his nerves by the calculus which shot forth its jagged points through the whole substance of his kidneys, so long as his soul continued to be possessed by the great subjects on which a powerful effort of his will originally fixed it.”

Similar experiences are related of Sir Walter Scott. Lockhart, in his *Life of Scott*, gives us the following account of some of them:

“John Ballantyne (whom Scott, while suffering under a prolonged and painful illness, employed as his amanuensis) told me that though Scott often turned himself on his pillow with a groan of torment, he usually continued the sentence in the same breath. But when dialogue of peculiar animation was in progress, spirit seemed to triumph altogether over matter; he arose from his couch, and walked up and down the room, raising and lowering his voice and, as it were, acting the parts. It was in this fashion that Scott produced the far greater portion of the *Bride of Lammermoor*, the whole of the *Legend of Montrose*, and almost the whole of *Ivanhoe*.”

General Horace K. Porter told the present writer that for two days before the surrender of Lee, General Grant suffered so intensely from pains in the head that he was entirely unable to eat or sleep. He spent the whole night previous to the surrender walking up and down the road in front of the farmhouse where his aides were resting, holding his hands to his head and often groaning aloud with anguish. At early dawn they helped him into his saddle and almost held him in his place as they rode on to meet the enemy. Presently a messenger from Lee came into sight with a note for Grant. He slowly dismounted from his horse, sat down on a stone by the wayside, and opened it. It contained just a sentence or two asking for the conditions of surrender. Grant immediately jumped into his saddle, put the spurs to his horse, and rode off so rapidly that his aides had hard work to keep up with him, declaring that he never felt better in his life.

The physicians of Green, the famous English historian, declared that he kept himself alive for five months after they had given him up by sheer force of will while he was composing the *Making of England* and the *Conquest of England*. One of the critics of his work at this period declares that "the style is serene and easy and the breadth and vigour of his generalisations his very best."

When Lieutenant Greely was asked how he and some of his followers kept themselves alive during their extraordinary sufferings in the north polar regions during the winter of 1883 he replied: "Our minds did it. I thought I must do it." Before the

discovery of chloroform patients not infrequently went through the severest operations and declared afterwards that they felt no pain whatever, so utterly absorbed were they in other thoughts. Such has been the testimony of many a martyr. Instances have occurred where the agony of being burned at the stake was endured with the calmest serenity owing to the engrossing attention that was being given to the beatific visions of coming blessedness.

A striking illustration of the power of the mind over the body is shown in the fire walk which just at present is attracting so much interest. This is a religious rite still practised by certain Orientals and has recently been described by a number of competent witnesses. In the island of Mauritius, some five hundred miles east of Madagascar, the ceremony occurs on the 1st of January, and is carried out under the supervision of the police, who see that no women take part in it and that no children are carried through the fire by their fathers. The day on which the event takes place is a holiday and crowds of people collect to look on.

Mrs. Mary J. S. Schwabe describes the scene in the *Journal of the Society for Psychical Research* for December, 1901, as she saw it in 1896 and 1897:

“A wide shallow trench,” she says, “about a foot deep, twelve feet wide, and fifteen yards long is prepared beforehand, and on it are placed large piles of wood which, when I arrived on the last occasion, were still burning fiercely; we therefore had to wait till the piles had burned down and become masses of red-hot embers.

Some men then came with long wooden rakes and raked the embers until they were spread over the whole surface of the trench to a depth of several inches. The radiant heat given out was so great that it was almost unbearable when we stood at a distance of several yards from the trench.

"A young goat was then brought to the edge of the trench, its head severed with one stroke of a sword, and the body dragged swiftly round the furnace as a sacrifice to the goddess Kali. This did not occupy more than a few seconds and the devotees at once advanced, led by the priest of the temple. He, like the others, was entirely naked with the exception of wreaths of flowers and leaves round neck and waist, and carried a kind of raised plateau of flowers in his hands. He stepped boldly on the embers, walked slowly from one end of the trench to the other, pausing once or twice to turn round and round as in a dance, and having reached the other side, stood there calmly awaiting the others, and holding the flowery erection above his head, a fine and picturesque figure. He was closely followed by the other devotees, some twelve in number, who crossed in turn; two or three looked as if wound up to the deed by religious frenzy, and one as if under the influence of bhang or similar narcotic, but the majority maintained their ordinary aspect, and none showed signs of visible suffering. Two or three women in yellow draperies rushed forward, but were seized by the police and removed after a violent struggle. Just beyond the farther edge of the trench a small pool, or rather puddle of water lay on the ground and some, but not all, walked through it on coming out of the trench."

The walk is nearly always undertaken, she tells us,

in fulfilment of a vow made to obtain the recovery of some relative, and in such circumstances the natives assert that the fire never hurts.

Mr. John Piddington, who resided for nearly fifty years in Mauritius, in commenting upon Mrs. Schwabe's account of the fire walk, adds a number of important facts (*Journal of the Society for Psychical Research*, June, 1902, pp. 251, 252). Among others that there is a trench of water eight or ten inches deep before the fire is reached as well as after; that the men who are to walk through the fire are Indians who have never worn shoes, and, being the most indefatigable walkers on earth, have the soles of their feet covered with horn of enormous thickness; and that all who undertake to carry out the rite are required to go through a rigorous mental training of a fortnight. As a result their minds are excited on the day of the fire walk to a state bordering on frenzy.

“When the time comes,” he continues, “they first walk through the water trench before the fire, then on to the embers, over which they pass more or less rapidly, and then through the second pool. Then they go away in a state of collapse to be nursed. Some are weak-kneed, and try to get out of the hot trench before the end. These are beaten back with sticks by the priests, who stand by the trench.”

Some striking accounts of the fire walk as practised in many different countries are given by Andrew Lang in his paper on the subject published in

the *Proceedings of the Society for Psychical Research* for February, 1900, noticeably one by Colonel Gudgeon, British Resident at Raratonga, and a like account by Dr. T. M. Hocken, of the Fiji fire ceremony, witnessed by him in 1898.

In the *Journal* of the Society for October, 1901, is reprinted in full a letter that appeared in *Nature* for August 22nd of the same year from the pen of Professor S. P. Langley, of the Smithsonian Institution at Washington, giving an account of the ceremony as he had recently observed it in Tahiti. While he has conclusively proved that the stones that the priest and his followers walked upon were not red-hot all over as they appeared to be, and fully established his point that it was not a miracle, the Tahiti case by no means sets aside the evidence that the heat of the material trodden upon by these fire-walkers is often so intense as to char the skin of a human being coming into contact with it under normal conditions. These cases taken together establish the position beyond reasonable doubt that the mind by "faith," or "full assurance," or "mania," or whatever you may please to call it, can for a time to some extent avert the destruction of the tissues of the body that would otherwise follow.

When we turn to cases illustrating the power of the mind in hypnotic sleep to check or dispel the pains of the body a striking array of most remarkable phenomena meets our gaze. Among the many cases reported by the famous Paris physician and psychiatrist, Voisin, as having been treated at the

great hospital of La Salpêtrière by hypnotic suggestion are the following: An hysterical woman, twenty-two years of age, who was suffering from maniacal attacks, hallucinations of hearing, and delirium, was cured entirely of her troubles by being thrown into an hypnotic state at the beginning of her attacks and kept asleep for ten or twelve hours. At first it took two hours or more to hypnotise her by making her stare continuously at her index finger held just above the root of her nose. But later it was easier to do it and soon she became healthy and normal and secured a good position as a nurse.

Another woman, twenty-five years of age, suffering from similar troubles, but much more violent, was hypnotised after great exertion and kept asleep for seven days and nights, except for half an hour each day when she was given a little nourishment. In a short time she fully recovered and was given a position in the hospital as a laundress.

Another hysterical woman, forty-eight years of age, with severe melancholia, hallucinations of sight and hearing, and a strong suicidal tendency, was relieved of all these symptoms and became well through suggestion under hypnosis. Voisin hypnotised a woman whose arm had been paralysed for six months and whose wrist and fingers were so bent inward by contracture that the long nails had made deep wounds in her hand, with the result that he finally made her in her sleep straighten out her fingers and move the diseased arm as easily as the sound one. The arm, of course, had not lost feeling and the muscles had not atrophied.

Many other French physicians have made much use of hypnotism in similar cases, and they report equally favourable results. They have also paid much attention to the application of hypnotism to alcoholism and dipsomania. Segard, giving an account of some of his experiments in the hospital of Toulon, reports a number of cases like the following: Mr. T., an habitual drunkard of several years' standing, was brought to the hospital suffering from gastro-enteritis and delirium tremens. On the 31st of August, when the first attempt to hypnotise him was made, it resulted in failure, but later, however, he was successfully thrown into a deep hypnotic sleep and treated by suggestion. This was done several times during the month of September. By the 1st of October he was dismissed as in a normal condition with a strong disinclination to taste of liquor imparted by suggestion. How long he held out against the old desire is not known. Another chronic alcoholic, forty-eight years old, was admitted on September 18, 1886, for "hallucination of three months' standing; dangerous to himself and family," and treated by the same method. On September 29th he was dismissed as cured.

Voisin, in 1887, published an account of four cases of dipsomania cured by this process. One of them was a man of Rouen, thirty-five years old, who had had regular attacks of dipsomania of ten days each twice a month for ten years. In two days he succeeded in curing him by hypnotic suggestion so thoroughly that no return of the attack occurred for at least two years. A woman of noble family, who

had suffered from violent attacks of alcoholism for several years, was cured by the same treatment in about a month and restored to her family in the full possession of her powers. At the second international congress against the abuse of alcoholic liquors, opened in Zurich on the 9th of September, 1887, Forel and Ladame reported several cases of dipsomania of long standing that they had cured by means of hypnotic suggestion. Björnström also began to employ this mode of treatment about the same time with marked success, and in all civilised lands it continues to be used more and more.

At the annual meeting of the British Medical Association, held in Edinburgh, July, 1898, Dr. J. Milne Bramwell reported to the association the results of his use of hypnotic suggestion in curing disease. Among the cases he outlined, which were abundantly corroborated by independent witnesses, were the following: A woman forty-nine years of age had suffered from pruritis and eczema for four years. She had had the best of treatment, but it was of no avail. The disease was supposed to be due to an organic trouble which disturbed the circulation. An operation to remove this trouble only made the disease worse. All other treatment being abandoned, Dr. Bramwell in August, 1889, tried hypnotic suggestion. Sixty-six unsuccessful attempts were made to hypnotise the patient during the next four months, the only result being that the disease grew steadily worse. The sixty-eighth attempt succeeded. All irritation immediately vanished and quiet, refreshing sleep followed. All signs of the

disease disappeared within two weeks, and three years after there was no indication of its return.

Another case was that of a girl, fifteen years of age, who had on the back of the left arm just above the wrist a patch of skin two and a half inches long by one and a half broad, from which perspiration constantly exuded. This trouble had existed from early childhood. It was greatly increased by exertion or emotion, and although the forearm was always enveloped in a thick bandage the perspiration was so profuse that it was constantly dripping upon the floor. No other means being found to stop it, resort was had to hypnotism. After two treatments the wound healed up and during two years preceding the report there had been no relapse.

A lawyer, thirty-four years of age, who in early life had been healthy and athletic, was brought to Dr. Bramwell for treatment June 2, 1890. His health began to fail in the fall of 1877, after an attack of typhoid fever. In 1882 he abandoned all work and became a chronic invalid. He suffered constantly from anæmia, dyspepsia, and insomnia, frequently had suicidal impulses, and once attempted suicide. Whenever he tried to exert himself he experienced the most acute pains in the lower part of the spine, and he could not walk a hundred yards without intense suffering. He had always received excellent medical treatment and had even tried six months of rest-cure, but all to no avail. From June 2nd to September 20th of 1890, he was frequently hypnotised by Dr. Bramwell. By the end

of July all the morbid symptoms had vanished and he was strong enough to go to work on a farm. No relapse has since occurred, and he can now walk forty miles a day without unusual fatigue.

On April 30, 1890, a Mr. E., a dipsomaniac, thirty-three years of age, came under Dr. Bramwell's care. Mr. E. had inherited a strong tendency to intemperance and at seventeen began drinking to excess. After many attempts to reform and many failures he finally, in 1887, was placed in a retreat for a year. But on leaving he betook himself to drinking worse than ever. Any slight physical pain or mental trouble would start a drinking bout, and he had one of these on the average once a week. Dr. Bramwell treated him at once by hypnotic suggestion and up to May 17, 1890, he was kept sober in this way. On returning home he relapsed in less than a month and seemed as incurable as ever. But he was again hypnotised daily for a week and since July 1, 1890, has shown no signs of giving way to his old habit.

Another dipsomaniac, aged forty-seven, who had been an habitual drunkard for seventeen years, and had had three attacks of delirium tremens and several of epilepsy, Dr. Bramwell hypnotised for the first time on April 22, 1895, and he has not since relapsed.

One of the most interesting cases he reported was that of a Miss F., aged twenty-eight, who came to him July 17, 1896. She had been suffering for five years with neuralgia of the leg supposed to be due to sciatica. During the first two years of her illness

she never walked over a quarter of a mile, and finally abandoned all attempts to walk and took to a rolling-chair. She tried almost every kind of treatment in succession,—rest-cure for two months, careful drugging, Weir Mitchell, massage, electricity, baths, and Paquelin's cautery to the leg, of which she had seventy applications daily from July, 1895, to May, 1896, amounting in all to about twenty thousand. Meantime her condition grew steadily worse and her case was considered incurable. In her desperation she was persuaded to try hypnotism. Dr. Bramwell treated her for the first time on July 17, 1896. In two days she completely recovered and soon learned to ride a bicycle. She has remained ever since well and active.

Dr. Bramwell also referred to a number of painless dental operations performed in March, 1890, by Mr. Turner, of Leeds, on some of his patients after being hypnotised, accounts of which are recorded in the *Journal of the British Dental Association*. The most notable case was that of a girl suffering from valvular disease of the heart from whom five teeth were extracted without pain.

On March 25, 1890, some of Dr. Bramwell's patients were taken to Leeds and operated upon in the presence of some sixty medical men, among them such eminent surgeons as Pridgin Teale and Mayo Robson. A delicate girl was put to sleep by a written order from Dr. Bramwell and sixteen of her teeth extracted without pain. There was no corneal reflex and the pulse fell during the operation. A boy of eight was operated upon by Dr.

Mayo Robson for exostosis of the great toe, after first being hypnotised. The surgeon first performed evulsion of the great-toe nail, then cut out the bony growth and a part of the first phalanx. None of the patients suffered any pain afterwards from the operations, although they all returned home the same day, and the healing of the wounds in every case was remarkably rapid.

In the discussion that followed Dr. Bramwell's report, Dr. David Fellowlees, Physician Superintendent of the Glasgow Royal Asylum, expressed his high appreciation of Dr. Bramwell's work, and said that his own experience enabled him to believe in the extraordinary cures that had been related by him.

Dr. John F. Woods, Medical Superintendent of the Hoxton House Asylum, London, stated that he had treated over one thousand cases by hypnotic suggestion and had found it exceedingly efficacious not only for functional nervous diseases, but for a much wider field. As the nervous system, he said, is implicated in almost all diseases, in so far as we can influence it for good we can benefit the disease. It was his opinion that hypnotic suggestion could be applied with advantage even to organic heart disease. It soothed the nervous system, secured sleep, and removed pain, thus improving greatly the patient's condition. Moreover, he said, we can produce a direct and specific effect upon the heart by placing one hand upon the epigastrium and suggesting that the heart shall quiet down and beat more slowly and calmly. He applied the hypnotic

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method of treatment to such diseases as rheumatic fever, pleurisy, pneumonia, and typhoid fever with marked success, thereby lowering the temperature, removing pain, quieting restlessness, and securing sleep.

We think we have given a sufficient number of cases and of sufficient variety fully to establish the proposition that the idea of disease may cause disease, and the idea of health may often dispel disease. A proper attention to the different cases will also, we think, abundantly vindicate the law so well stated by Dr. Goddard that "the idea of disease produces disease in direct proportion to its definiteness and in inverse proportion to the strength of the idea opposing it." That is to say, if a person had a very definite and vivid idea of a certain disease and expected to have it, he would induce that disease rather than some other that he knew little or nothing about. On the other hand, if he had a tolerably clear idea of a given disease, but did not think it was at all likely he could have it under the circumstances, he would, to just that degree, refrain from inducing it.

How this law is possible will be seen when we recall the fact, now generally accepted, that every idea expresses itself to some extent in motor action. As another puts it, every idea "generates its actuality." If a being is so poorly organised that it can only form one idea at a time this idea will always give vent to itself in some kind of external motion. The brain cells employed in the formation of the idea will discharge their nerve-force with nothing to im-

pede its spontaneous outgo. The very existence and continuance of animal life is dependent upon this fact. This is probably the condition of all organisms below man that possess any sort or degree of consciousness. But whether in man or brute it is rightly called impulsive and is the lowest form of mental activity. Man as he is now constituted is not merely an ideo-motor being, but an ideo-idea being. He has so far advanced beyond this first stage of development that he can have at least two ideas in consciousness at the same moment, and thus he is able to re-enforce his first idea with all the nerve-force of the second, or to hold the first in check by a counter action. A series of ideas may be formed, all working for one common end or all inhibiting a previous idea and nullifying its power.

The extent to which the nervous energy of the organism can thus be manipulated to produce or inhibit disease is beyond our estimation. It varies enormously in different individuals and is applicable to different diseases in different degrees. Why it shows itself more decidedly in hypnotism is due to the fact that in the hypnotic state opposing ideas are absent. For it is a dream state in which the stream of thought is by agreement, so to speak, directed by another. The hypnotiser has no power that the subject does not give him. Even in sleep it is probable that he need not obey the hypnotiser's commands if he really does not wish to do so. But, having been put to sleep with the understanding that he is always to do what he is told to do, he

implicitly carries out to the best of his ability the operator's commands.

Whether it be true or not that every cell of the body has its own consciousness, it is clear that, when the rudiments of a nervous system have once been developed, what is called by some the general consciousness takes control and attends to the welfare and reputation of the body as a whole. Trouble in some degree is of course constantly arising in all parts of the organism in the ceaseless endeavour of each cell to adjust itself to its appropriate tasks. But ordinarily the general consciousness does not concern itself about such slight matters. Only when the disturbance is decidedly interfering with the normal action of the organism as a whole will it take a hand in the affair. If anything happens, however, to direct its attention to any group of cells in almost any organ of the body, it will at once find actual pain there and pain that can be greatly intensified if earnestly looked for. In the same way anything that distracts the attention from an injury lessens the pain.

Every experience with mental therapeutics abundantly proves that great pains can be entirely removed so long as the attention is focused on some other object or idea. This accounts for the fact that many cures that seem at first to be permanent turn out to be the opposite. The pain is inhibited for the time; and as pain is the chief sign of disease the patient thinks he has been made entirely whole. It is just this power of attention that makes all healing by mental methods possible.

All the cases enumerated above can be reduced to the principle of suggestion, whether they occurred in wakefulness or hypnotic sleep. And the stronger the suggestion, other things being equal, the more perfect will be the cure. The reason why so many more successful cures take place in deep hypnotism than in light, as is clearly shown by the tables of results prepared by Dr. Goddard, is the fact that the deeper the hypnotism the less the opposition to the suggestion of the hypnotiser; in other words, the more likely it is that the suggested result will be produced.

There are probably no pains, so physicians tell us, that may not be originated by hysteria. Neuralgia is often of hysterical origin. So are the diseases of the joints and functional derangements of the viscera. Any organ may be affected by it. It may bring on all sorts of stomach disorders and it often simulates organic disease of the heart.

Such being the facts we have a right to argue with Dr. Hall that "if mind causes disease, it is reasonable to suppose that it can cure the diseases it causes." Such is the observed fact, and it is commonly admitted by the best physicians. They do not claim to be infallible or to have a material remedy for every ill. They would even be willing to subscribe to the opinion expressed some time ago by Dr. Edes, long Professor of Materia Medica in the Harvard Medical School, that we should not hesitate "to look the fact squarely in the face that some persons do receive great benefit from some of these forms of treatment, who have failed to do so

at the hands of regular and skilled practitioners." The exact division between curable and incurable diseases is far from settled. Nor are we by any means yet able to say to what extent the method of cure by suggestion can be carried. But it certainly deserves a place alongside of drugs in dispelling human ills and thereby administering to the health and happiness of the race.

CHAPTER VIII

THE HEALINGS OF CHRISTIAN SCIENCE AND THE MIRACLES OF LOURDES

THE first person to attain prominence in America as a mental healer was Phineas P. Quimby, of Belfast, Maine. He was born in Lebanon, New Hampshire, February 16, 1802, but his parents moved to Belfast while he was still a child and he received his education chiefly in that town. Although he was a studious and thoughtful man of inventive mind he did not attract any special attention until he was about thirty-six years of age, when he discovered that he had unusual hypnotic power. One of his best subjects betook himself to diagnosing diseases, and he was so successful in his endeavours that Dr. Quimby came to the conclusion that the relation between hypnotism and disease was a very intimate one.

"When I mesmerised my subject," he says, "he would prescribe some simple little herb that would do no harm or good of itself. In some cases this would cure the patient. I also found that any medicine would cure certain cases if he ordered it." After much reflection on the subject he was led to what he regarded as the greatest discovery that had

ever been made, namely, that the cause and cure of disease is not a physical condition, but a mental state. He soon dropped hypnotism as an unnecessary adjunct to his work and wrought his cures by talk alone. His method was to sit down by the side of his patient, vividly describe to him his disease, tell him it was all a state of his mind, and exhort him to change his mind and be cured. Sometimes, if the suffering was caused by neuralgic pains or a sprain, he would wet his hands in water and rub his patient's head and limbs. But he always insisted that the rubbing had nothing to do with the cure. It only helped the sufferer to overcome his opposition to the truth that disease is a state of mind, thereby enabling him to get into his head a new idea.

In one of his writings the doctor says: "I deny disease as a truth, but admit it as a deception, started like all other stories without any foundation, and handed down from generation to generation till the people believe it, and it becomes a part of their lives." Admitting all his crudeness and superstition, we should not refrain from giving him the credit of first applying the doctrine that matter is the creation of mind to the prevention and cure of disease. He devoted himself assiduously for a number of years to his mission as a mental healer. His practice was chiefly in Portland, where he had a large number of patients and performed some wonderful cures. He broke down from overwork in 1866 and died that same year.

But before he died he had for a patient Mrs.

Mary Baker Glover Patterson, the founder of Christian Science, the wife of a dentist in Franklin, N. H. Mrs. Patterson left her husband in 1862 to go to Portland to be treated by the mental methods of Dr. Quimby. As a child in Bow, N. H., where she was born July 21, 1821, she was sickly and hysterical, unable to attend school much, or to engage often in the social life of other children of her years. In 1843 she married a Mr. Glover, of Wilmington, N. C., but he died suddenly of cholera the next year. Some fourteen years later she married Dr. Patterson, who was a man of excellent character and devoted to his wife.

After being cured by Dr. Quimby she obtained a divorce from Dr. Patterson and gave herself up to the elaboration and defence of Christian Science, publishing her first edition of *Science and Health* in 1875. In 1877 she married Asa Eddy, of Lynn, Mass., and two years later organised a "mind-healing church," becoming its pastor in 1881. She founded her Metaphysical College the same year, being assisted in its administration by her husband and her adopted son, Foster Eddy. In 1882 Mr. Eddy suddenly died, and in 1889 Mrs. Eddy closed her college and devoted herself entirely to the elaboration of her views. She now lives in elegant retirement at her country place in the suburbs of Concord, N. H., being rarely seen even by her most devoted followers. Mrs. Eddy claims that she has personally taught four thousand Christian Science healers, and her "churches" now exist in nearly all parts of the civilised world.

Although Christian Science, both as to its doctrines and methods of healing as represented by Mrs. Eddy, is an offshoot of Dr. Quimby's Mental Science, it differs from it in several important particulars. Dr. Quimby never assumed any supernatural origin for his positions, but Mrs. Eddy claims throughout divine inspiration. Her book, entitled *Science and Health, with a Key to the Scriptures*, begins in the 161st edition as well as in the first with these words: "In the year 1866 [this is the year Dr. Quimby died,—still Mrs. Eddy nowhere acknowledges her indebtedness to him for her views] I discovered the Science of Metaphysical Healing and named it Christian Science. God had been graciously fitting me during many years for the reception of a final revelation of the absolute Principle of Scientific Mind-healing." She regards herself and is regarded by her followers as the mouthpiece of God. The reason she gives for the statement that "a Christian Scientist requires my book on *Science and Health* for his text-book and so do all his students and patients" is the fact that "it is the voice of Truth to this age." Because of the divine origin of her message she prefixes the title Reverend to her name. People are cured, she asserts, in the very act of reading her book, sometimes by reading only a few pages.

Most of the Mental-Science healers of to-day, since they are not under the absolute domination of one mind claiming infallibility and do not have any organisation, have learned something by experience. Many of them admit that progress must be evolu-

tionary. In a recent pamphlet published by the Metaphysical Club of Boston it is expressly said of the science: "It does not ignore the good in existing systems, disparage reasonable hygiene, or deny the place of certain departments of surgery. It is not insensible to the present and provisional uses of simple external therapeutic agencies."

This freedom from dogmatism, and the search for a general principle upon which to explain its results, makes Mental Science, as Dr. Goddard has well pointed out, far more scientific than Christian Science. For Mrs. Eddy's position is not affected at all by results. She simply asserts uncompromisingly that "the opposite of truth—called error, sin, sickness, disease, death—is the false testimony of false material sense." Mind alone is. There is no such thing as body or matter, and therefore there can be no disease. All sickness is a delusion of "mortal mind." The "treatment" consists in asserting this view of the case and getting the patient to accept it. The acceptance of it is the cure. It is for this reason that it is so difficult to get evidence of alleged cures by Christian Science healers. Mrs. Eddy says of herself (page 86): "I never believed in receiving certificates or presenting testimonials of cures; and usually when healing I have said to the individual, 'Go, and tell no man.' "

Still, on pages 87–89 of her *Science and Health*, she offers a few examples of her healing power. These are so extraordinary that before we pass judgment upon them we need to remind ourselves of the necessary criteria for deciding upon the reality of an

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alleged cure. It is not claimed that these requirements must all be fully met in every case. But it is claimed that they must be present in some degree before we are justified in accepting any reported extraordinary case of healing as an actual fact.

In the first place, the evidence must be minute as to essentials and must be first-hand. This requires that the description of the case before and after the alleged cure should be given in sufficient detail to enable others to form a judgment in the matter as well as the persons giving the evidence; and also that the physician in charge and the patient himself should be the ones to tell us what has happened and the circumstances under which the change took place. Oftentimes the exact history of a case is one of its most important features, as heredity and environment account for many ills.

In the next place, evidence in these cases, to be trustworthy, must be given by competent witnesses. As a rule a layman is not competent to give such evidence. He may be as intelligent as a physician, but he is not sufficiently acquainted with the detailed and exact rules for describing the complex phenomena of a disease, and he will fail to make his statements clear and unambiguous. Here as everywhere else scientific accuracy requires that the "consensus of the competent" should be at hand regarding the reality and nature of the alleged cure.

In the third place, the evidence offered should be supported by objective records. As many facts as possible should be ascertained by instruments constructed for the purpose and not merely by the

unaided powers of man. The thermometer, for example, often gives more accurate information about a patient's condition than either the doctor or the patient can furnish. The condition of the pulse, the respiration, the character of the excreta and the sputa, and much other objective data should be obtained and carefully put on record if we are to have a fully satisfactory statement of the case.

While these criteria are imperative in some degree in every well-attested case of disease and cure, their application by no means prevents us from accepting as veritable facts many alleged cures that on their face seem wholly incredible. Take, for example, the matter of temperature. It was once held that no person could be cured of a disease whose temperature had reached 108° or 110° Fahrenheit. From millions of observations carefully recorded we find that the temperature of ordinary health is from 98° to 99° Fahrenheit, and that every additional degree implies a corresponding degree of fever. A temperature of 106° Fahrenheit is an alarming symptom, and not one person in a million ever reaches 110° . Previous to a recent date there were no records of any person in any country having attained a temperature much higher. In spite of all this we have the famous case reported by Dr. J. W. Teale, of Scarborough, England. He announced on February 26, 1875, to the London Clinical Society that a patient of his, suffering from a fall from her horse, maintained for seven consecutive weeks a temperature never less than 108° , and for several days showed a temperature of 122° .

His statement was, of course, received with the greatest incredulity, especially when he added that the patient afterwards entirely recovered her normal health and strength. Yet when the evidence was adduced everybody accepted it, for it conformed to all the criteria required in such a case. Seven thermometers had been used in making the observations, three of which had been made for the purpose. Four of the number had been sent to Kew to be tested and had been found to be correct within a tenth of a degree. Each thermometer had been carefully examined both before and after its use by several trustworthy witnesses and the results recorded at once in writing. The temperature had been taken at the same time in two and sometimes three parts of the body, and each thermometer after use had been shaken down to its normal reading and changed in position in order to eliminate all possible error due to accident or fraud. No hot water in bottles or other forms had been allowed in the room. For nearly ten weeks these elaborate observations had been made daily and carefully placed on record. When evidence like this is forthcoming for any alleged extraordinary events we are bound to accept them as genuine and give them full credence, whether or not we have at hand for them a satisfactory explanation.

Now let us apply these criteria to a few of Mrs. Eddy's alleged extraordinary cures. Among them are the following: The first one is described for Mrs. Eddy by a Mrs. Elizabeth P. Baker, who says (page 87):

“ Miss Ellen C. Pillsbury, of Tilton, New Hampshire, was suffering from what her physicians called enteritis in the severest form, following typhoid fever. Her case was given up by her regular physician, and she was lying at the point of death when Mrs. Glover [afterward Mrs. Eddy] visited her. In a few moments after Mrs. Glover entered the room and stood by the bedside, Miss Pillsbury recognised her. . . . In about ten minutes more Mrs. Glover told her to rise from her bed and walk. Miss Pillsbury arose, walked several times across her room, and then sat down in a chair. . . . The next day she was dressed and went down to table, and on the fourth day she made a journey of about a hundred miles in the cars.”

The second case is that of Mr. R. O. Badgely, of Cincinnati, Ohio, who at the time of the accident wrote to Mrs. Eddy as follows: “A stick of timber fell on my foot from a building, crushing the bones. Cannot you help me? I am sitting in great pain with my foot in a bath.” She treats him silently, and he asserts in his second letter: “My painful and swollen foot was restored at once on your receipt of my letter, and that very day I put on my boot and walked several miles.”

The third case is vouched for by L. C. Edgewood, of Lynn, Mass., who sends to Mrs. Eddy the following testimonial under date of June, 1873:

“ My little son, a year and a half old, had ulceration of the bowels and was a great sufferer. He was reduced almost to a skeleton and growing worse daily. He could take nothing but gruel, or some very simple nourishment.

At that time the physicians had given him up, saying they could do no more for him, and he was taking laudanum. Mrs. Eddy came in, took him up from the cradle, held him a few minutes, kissed him, laid him down again, and went out. In less than an hour he was taken up, had his playthings, and was well. . . . The day after she saw him he ate all he wanted. He even ate a quantity of cabbage just before going to bed."

In Mrs. Eddy's own account of her cure of Mr. Clark, of Lynn, of hip disease, she says:

"On entering the house I met his physician who said he was dying. He had just probed the ulcer on the hip and said the bone was carious for several inches. He even showed me the probe, which had on it the evidence of this condition of the bone. The doctor went out. Mr. Clark lay with his eyes fixed and sightless. The dew of death was upon his brow. I went to his bedside . . . In about ten minutes he opened his eyes and said: 'I feel like a new man. My suffering is all gone.' . . . Since his recovery I have been informed that his physician claims to have cured him; and that his mother has been threatened with incarceration in an insane asylum for saying: 'It was none other than God and that woman who healed him.' "

In a letter to the *New York Sun*, dated December 15, 1899, Mrs. Eddy writes as follows:

"I challenge the world to disprove what I hereby declare. After my discovery of Christian Science I healed consumption in its last stages that the M.D.'s by verdict of the stethoscope and the schools declared incurable,

the lungs being mostly consumed. I healed malignant tubercular diphtheria and carious bones that could be dented by the finger, saving them when the surgeon's instruments were lying on the table ready for their amputation. I have healed at one visit a cancer that had so eaten the flesh of the neck as to expose the jugular vein so that it stood out like a cord."

Not a particle of evidence is offered in the letter in support of these assertions, nor, so far as is known has any evidence ever been offered to competent scientific investigators in substantiation of any of these claims. Every one of the recognised criteria of a rational belief in such cases is notoriously absent. Until these alleged cures are properly accredited we have no ground for accepting them as real and should not treat them as in any sense demanding consideration.

A few of the alleged cures reported by other Christian Science healers that are somewhat better attested than the above are the following: Mr. J. R. T., a solicitor of Los Angeles, California, gives us a detailed account of his almost complete cure of a malformation of his foot and leg by this method, and I quote from this account as published in the *Proceedings of the Society for Psychical Research* for June, 1893, pp. 171 *seq.* :

"I was born September, 1858. At my birth my right foot was deformed, being turned upon one side, and in after life my right leg did not grow equally with the left leg, so that at the time Christian Science was introduced to me (June, 1889) my right leg was about two inches

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shorter than my left leg, so that I had to wear a thick cork sole upon my right shoe. While in Washington in January, 1891, I made the acquaintance of Miss Virginia Johnson, and also of Mr. and Mrs. Packard, all of whom were pupils of Mrs. Eddy. When about to leave Washington and return West, Miss Johnson encouraged me to go to Concord and call upon Mrs. Eddy. . . . The next morning, Sunday, January 25th, while lying in bed and wondering how I could manage to call upon Mrs. Eddy and make a presentable appearance, I chanced to stretch out my legs and was surprised to find that they were nearly the same length. I dressed, borrowed a cast-off shoe, and wore it upon my right foot that day. . . . I have worn straight shoes of the ordinary ready-made kind ever since, while before I required for my right foot a special shoe which cost me ten dollars. . . . I had studied Christian Science for a year and a half before the above demonstration came."

Lieutenant F. H. Crosby, United States Navy, under date of November 15, 1892, corroborates the above facts.

"I certify," he says, "that I am personally acquainted with Mr. J. R. T. of Los Angeles, Cal., that I saw him very frequently, about the time his leg was lengthened. . . . I am as sure as I can be of another man's acts that he used no other means to bring about the lengthening of his leg than the methods of Christian Science."

Dr. Myers, of London, Secretary of the Society for Psychical Research, desiring to get the fullest information about this case, wrote for answers to the following questions:

“ Was there any full description of the limb, its bones, joints, and muscles before the lengthening? Was there any elongation of the long bones of the limbs, the femur, tibia, or fibula, such as could be shown by the comparison of measurements made between different parts in the same bone before and after the lengthening? Was there any curvature which by being straightened could have made the bone longer? Was there any evidence of chronic muscular spasm before the lengthening, of tension or adhesion of the tendons, or muscles, or fasciæ or slight chronic displacement of the bones at the joints, the hip, the knee, or the ankle? ”

In reply to these inquiries he was told that,

“ As to having an M.D. to perform any measurements to satisfy his unbelief in the power of mind to shape its own conditions of expression I must respectfully decline. The proofs of Divine Science can never be discerned through material means and measures. ‘ A wicked and adulterous generation seeketh after a sign, and no sign shall be given except the sign of the prophet Jonas.’ . . . If I were to destroy every scrap of evidence that I had ever had of the deformity I have spoken of, it would relieve me of much that is not desirable. I knew when the Society was discussing it, and was almost unable to put on my shoe by reason of the swelling induced in that member when it was being mentally discussed in London.”

Another much-quoted case is that of Eliza H., who slipped in the dark and was thrown against a stone wall at the foot of a stairway.

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“By this accident,” she writes, “six ribs were dislocated, the bones of my right wrist were all displaced, and my hand pronounced useless henceforth; my skull was crushed, my stomach was injured, and all my other internal organs displaced; my spine also was seriously affected. I was attended by the most eminent physicians. After four years of intense suffering, chills and fever set in for nine months. On this account it was thought necessary to send me out West. I went to the country to gain strength and returned to the city in the autumn, expecting to be operated upon in the hospital where I was a patient, but Professor Fellowes and Dr. Ludlam stated in lectures to their classes that it would be impossible, as my body was a complete wreck. Also, as all the inward organs were displaced, it was thought that I could not rally from the effects of chloroform. Seven years of intense suffering were passed in a pilgrimage from hospital to hospital. I was entirely helpless and pronounced incurable, when a friend opened my eyes to the truth. From that hour I abandoned all medicine and trusted God. I began to mend slowly but surely and as a result of mental treatment only, followed by earnest study; I am now in vigorous health, able to accomplish any work, such as running a sewing machine for hours at a time, walking great distances, going up and down stairs with perfect ease and pleasure, etc., and find my happiness in imparting to others what I have received and am continually receiving.”

In this case, as in the one preceding, no details can be procured other than those given by the patient. We have the evidence of no other person as to the original displacement “of all the inward organs” or

of their final adjustment. The seven years of hospital life furnish us no light upon the extraordinary complications in the case. Professor Fellowes and Dr. Ludlam offer us no testimony whatever bearing upon the patient's condition when under their care.

This notorious lack of evidence in all the accessible accounts of cures by Christian Science healers where organic ailments are concerned and where evidence of the exact condition could easily be ascertained by a competent physician, entirely justifies us in declining to regard them as established facts. All the real ills controlled or alleviated by their method of treatment,—and they are many—are, so far as can be ascertained, chiefly nervous in their origin and sufficiently accounted for as due to a strong act of will induced by a suggestion or self-suggestion of the imagined cure.

The success and failure of Christian Science healers are closely paralleled by those of the so-called mental healers from whom, as we have seen, their ideas and methods are derived. But to be fully comprehended they need to be compared with those of the Faith-curists who are becoming so numerous in our day. Advocates of the Faith-cure theory differ from the advocates of Christian Science in holding that pain and disease are real, but in their methods of healing they essentially agree. Faith-curists tell the sufferer to commit his ways unto the Lord and his ills will vanish. They all claim to follow explicitly the Bible, but vary somewhat among themselves as to what the Bible teaches. Some hold that the sufferer should be anointed after the sug-

gestion of the Apostle James. Some claim that the laying on of hands is necessary; others that prayer alone will suffice. A few teach that God may will that the sickness is to be patiently endured, but nearly all maintain that the cure will always be according to the faith of the patient.

There are many so-called tramp healers who adopt this method, such as Schrader, Schlatter, and their imitators, but the two most prominent Faith-curists in America who have permanent headquarters are Rev. A. B. Simpson, of New York City, and Rev. John Alexander Dowie, of Chicago. The former holds that it is dishonouring God, after you have prayed for health, to doubt that you have it or ask for a sign; the latter argues that it is a lie to claim that you are healed when you are not. For that reason Dr. Dowie in his "Divine healing home" in Chicago keeps a record of individual cures which is of considerable value and completeness. He does not claim that all are healed.

Dr. Goddard tells us (*American Journal of Psychology*, April, 1899, pp. 442, 443) that in 1898 there were about sixteen hundred cases then on record which he examined with care.

"About two-thirds of them," he says, "are females. In age they range from six months to eighty-six years, though the main part of them are between twenty and fifty. Of the women, the married are about three times as numerous as the unmarried. . . . The duration of the disease from which they were healed varied from a few minutes to fifty-two years. The average time is about twelve years for each sex.

“Thirty-three per cent. report their healing as instantaneous, fifty per cent. say that they are not yet perfectly healed. It must be noted that while thirty-three per cent. report instantaneous healing, it is clear from their own account that they almost always mean that pain ceased instantly, and it may be mentioned here that of all returns that give data upon that point, almost every one shows that pain ceased at the time of prayer.

“Again, of the whole number seventy-six per cent. were treated or prayed with by Dr. Dowie in person, seven and one half per cent. were prayed for by him at a distance. Four and one-half per cent. were prayed for by Mrs. Dowie. Seven and one-half per cent. were healed in answer to their own prayers or efforts, and four and one-half per cent. were healed in answer to prayers of friends.”

As an indication of the range of these alleged cures Dr. Goddard notes the following:

“Legs lengthened from 1 to 5 inches. Gained 95 lbs. Hip $2\frac{1}{2}$ inches reduced. 56 abscesses at one time cured. Deaf and dumb. Senseless 3 weeks. While the men report: 40 whiskies a day cured. Wreck physically. Hip disease. Goitre. 3 bullets. Deaf and dumb. Fever settled in bones. Appendicitis. Leg shortened 2 inches. Born blind. Deaf after measles.”

It is beyond reasonable doubt that many persons treated by the method of the Faith-curists have actually been cured, and in some instances even after all other means had failed to benefit. A number of genuine cases are known in which the

Faith-curists succeeded where the Christian Scientists failed. The methods of both are, however, essentially the same and have the same limitations. Whenever their alleged cures have transcended the known effects of the mind upon the body the evidence for their genuineness has invariably failed to meet rational demands. The investigation of a few of their test cases will make this evident. They are selected from a large number reported to the Society of Psychical Research and published in the *Proceedings* of the Society for June, 1893. As the mere statement of the cases contains all that is known about them they will be passed by without further comment except to note the fact that they are almost identical in character with those already quoted from the records of Christian Science.

“ My little daughter, at the age of seven, was suffering from chronic indigestion which cased her much pain. She had been under the treatment of a physician for several months and he gave no hopes of an early recovery. The faith-healing doctor above referred to happened at the time to be visiting at my house and it was suggested that he should anoint the child and pray with her. The matter was explained to her and she said she did not know whether she would like to have it done or not, and that she would think about it. This she did for a day and then came in a great hurry, saying, ‘ I ’m ready now and he must do it at once.’ The usual ceremony was gone through and the child was at once cured.”

Another case is the following :

“ My younger brother’s wife had a disease of the circulation called the ‘ milk leg ’ by which she was laid up, unable to stand or to move the leg for about a year. One day her physician had made a fresh special examination and stated that there was no hope of her walking for another year. Under a strong impulse of despair succeeded by one of hope, she said, ‘ I will trust God and walk.’ She rose up, dressed for the first time for twelve months, and has in the six years since had no relapse.”

A fair example of the way these alleged extraordinary cures lose, in large measure at least, their unusual character when the evidence in their support can be sifted is given by Dr. J. M. Buckley in his book entitled *Faith-Healing, Christian Science, and Kindred Phenomena* (p. 54). As originally reported it runs as follows:

“ His son (my family physician) at twelve years of age broke both bones of his arm below the elbow, which were set by an uncle. Two days afterwards the boy came to his father and asked him to take the arm out of the splints. The father explained the certain results, but the lad said: ‘ You taught me to ask Jesus for what I wanted and to be sure that I would get it, and I have asked Him.’ The child was so persistent that at length the father directed the uncle to remove the splints. The arm was fit for use! The uncle nearly fainted with astonishment. Told to me at the time, all the parties my trusted friends, I am compelled to believe in the fact.”

Dr. James Henry Lloyd, of the University of Pennsylvania, thoroughly investigated this case and

the results are embodied in a letter signed by the very child in question, who is now a physician.

“DEAR SIR:

“ The case you cite, when robbed of all its sensational surroundings, is as follows: The child was a spoiled youngster who would have his own way, and when he had a green-stick fracture of the forearm, after having had it bandaged for several days, concluded that he would much prefer going without a splint. To please the spoiled child the splint was removed and the arm carefully adjusted in a sling. As a matter of course the bone soon united, as is customary in children, and, being only partially broken, of course all the sooner. This is the miracle. Some nurse, or crank, or religious enthusiast, ignorant of matters physiological or histological, evidently started the story, and unfortunately my name—for I am the party—is being circulated in circles of faith-curists, and is given the sort of notoriety I do not crave.

“ Very respectfully yours,

“ CARL H. REED.”

Among the most extraordinary cases of healing in modern times are those commonly known as the miracles of Lourdes. At this obscure little village in the Pyrenees in the south-western corner of France it is alleged that the Virgin Mary between the 11th of February and the 16th of July, 1858, appeared eighteen times to a poor little shepherd girl, thirteen years of age, by the name of Bernadette Soubirous; and that in direct consequence of these visions miraculous cures, now amounting to many thousands,

have been performed in and near the grotto where the Virgin was first seen.

Bernadette, it is said, on the morning of February 11th, a few days before her first communion, went out with two other little girls to gather sticks for her mother along the banks of a small river that flowed near her home. Being a sickly and delicate child she soon found herself far behind her companions and separated from them by a brook too wide for her to jump across. While she was taking off her shoes and stockings to wade through the ice-cold water she suddenly heard a rushing mighty wind which was as suddenly followed by a dead calm. As she looked up she beheld in the hollow of the rocks near by a great light. This light enveloped the figure of a beautiful woman clad in glistening white robes, with a blue girdle about her waist, a golden coloured rose upon each foot, and a rosary hanging from her hands which were folded gently upon her breast. As the lady smiled upon the child she fell upon her knees in joyful adoration, repeated the Lord's Prayer, the Hail Mary, and the creed, with the last words of which the vision vanished.

Bernadette hurried home and told her mother and elder sister what had happened. They tried at first to dissuade her from revisiting the place, but in vain. Every time she went to the spot, no matter how many accompanied her, she would fall upon her knees, see the beautiful figure of the Virgin, and hear the voice. On one occasion the Virgin said to her: "I do not promise to make you happy in this

world, but in the next. I want many people to come." On another she said: "Penitence! penitence! penitence! Go and tell the priests to cause a chapel to be built; I want people to come hither in procession. Go and drink of the fountain and wash yourself in it. Go and eat of that grass that is there." At one of the last of her manifestations the Virgin declared: "I am the Immaculate Conception."

At first these alleged facts about Bernadette were discredited by the civil and ecclesiastical authorities, but the sincerity and assurance of the child dispelled all doubt. As soon as the knowledge of these appearances became known the sick from all the surrounding country were brought in great numbers to Lourdes to be bathed in the waters of the fountain that the Virgin caused to spring up in the little grotto at the entrance of which she had first been seen. People afflicted with almost every known disease, it is claimed, were by this act instantly cured. The official record of what has since taken place at this fountain, called *Annales de Lourdes*, now numbers nearly thirty volumes. Dr. Boissarie, who as an expert claims to give a scientific presentation of the evidence for these miraculous cases, after long personal investigation and full access to all the facts asserts in his work, entitled *Lourdes depuis 1858*, that over nine thousand French people have already been miraculously cured at this fountain and as many more from other parts of the civilised world, even Canada and the United States having a large representation. He also asserts that as many as

three hundred thousand persons have visited the place in a single year. In the great basilica that has been built above the grotto over eight hundred ex-votive banners from all quarters of the earth hang down from the vaults, and the number is increased almost daily by one or two.

Barbé, in his work on Lourdes, describes in detail the method of treatment adopted at these baths:

“In the centre,” he says, “is the basin fed by two large taps through which the water is changed three times a day. In this water bathe the sick, whatever their diseases. Contagions, infections of all kinds enter the water alike. The pilgrims have no fear. Nor, indeed, is there a single case on record of sickness contracted at the fountain of Lourdes. . . . According to the nature of the malady a patient is lowered into the water by means of a sheet or of broad straps passed under the back and under the legs, four persons holding the ends. . . . Before the immersion, while it is taking place, and after it, prayers are offered. The friends of the patient may choose the first prayers; next, when he is ready for the bath, he is asked to recite an act of contrition; while he is in the water the following invocations are said, each three times:

Blessed be the holy and immaculate Conception of the Blessed Virgin Mary, Mother of God.

Our Lady of Lourdes, pray for us.

Our Mother, have pity on us.

Our Lady of Lourdes, heal us for the love and honour of the Holy Trinity.

Our Lady of Lourdes, heal us for the conversion of sinners.

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Health of the sick, pray for us.

Succour of sufferers, pray for us.

O Mary, conceived without sin, pray for us who have recourse to thee."

When the patient is able, he joins in the prayers. While the dumb, the paralytic, consumptives even, are lying in the cold water of this mountain spring "hundreds of voices are storming Heaven with prayers. Shouts go up. Men fall on their knees with their arms out in the form of the cross of Christ. It is an enormous effort of desire." No claim is made that all are healed, but that they come out at least with the peace of a profounder resignation. It is asserted by the officials that of all the cases of consumption, rheumatism, and kindred diseases treated at Lourdes no one has been made worse by being held in this cold bath.

The water at Lourdes has frequently been analysed by competent authorities. The Professor of Chemistry at Toulouse writes of it: "The water contains no active substance capable of endowing it with marked therapeutic properties. It can be taken without injury." No one, we are told, is allowed to bathe in the grotto until he is examined by the physicians in charge and his disease is known to be genuine. The books of the office are open to inspection by any doctor or medical student, French or foreign.

There can be but little doubt that Bernadette reported in good faith and with a fair degree of accuracy what she believed she saw and heard. Such

appearances of the Virgin have often been reported, especially by young religious enthusiasts. In this case, as in many others of a similar kind, the vision was in all probability a real one, but without a concrete objective basis in an actually external fact. For no one saw the figure but the child on any of the alleged appearances, although others were with her when the visions occurred. No objective occurrence was so connected with it as to call it forth, and no means were given to verify its alleged prophecies by subsequent events.

The first and in some ways the most extraordinary of these miracles is the so-called "miracle of the taper." It is described by Dr. Boissarie as it was told to him by a certain Dr. Dozous, who first aroused public interest in these phenomena.

"The girl upon her knees," he says, "held in one hand a lighted taper, which rested upon the ground. During her ecstasy she put her hands together and her fingers were loosely crossed above the flame which they enveloped in the cavity between the two hands. The taper burned; the flame showed its point between the fingers and was blown about at the time by a rather strong current of air. But the flame did not seem to produce any alteration in the skin which it touched.

"Astonished at this strange fact, I did not allow any one to put a stop to it, and taking out my watch I could observe it perfectly for a quarter of an hour. Her prayer ended, Bernadette rose and prepared to leave the grotto. I kept her back for a moment and asked her to show me her hand, which I examined with the greatest care. I could not find the slightest trace of a burn anywhere. I

then tried to place the flame of the taper beneath her hand without her observing it, but she drew her hand quickly back, exclaiming, ' You burn me ' ' (*Lourdes*, p. 39).

Making all due allowance for exaggeration, and allowing even the essential truthfulness of this narrative, we have no adequate ground for supposing that the event was due to the special presence of the Virgin Mary. Similar events showing the power of the mind to resist for a time to some extent the destroying effects of fire are reported and vouched for by competent witnesses and have been fully described in the previous chapter. They do not necessitate the assumption of a superhuman agency.

Soon after this miracle of the taper a quarryman by the name of Bourriette, whose eyes had been injured by an explosion, conceived the idea of bathing his eyes with some of the water from the spring that was discovered in this grotto. He was greatly benefited, and so were many others of his class who were led to try the same remedy for similar ills. And soon the idea spread far and wide that if a sufferer from any disease could only be brought to Lourdes and let down into these waters the Virgin would have pity upon him and make him whole.

Among the many striking cases Dr. Boissarie describes is that of Mlle. Blondel, which we summarise as follows: In 1879 a woman by the name of Blondel was brought to Lourdes who for the previous five years had been suffering from a rheumatic attack which "affected her spinal cord and produced

a paralysis of her lower limbs." She had been treated by every known method without improvement. Two baths in the sacred waters were of no avail, and for three years treatment was abandoned as hopeless. In 1882 she was brought again to Lourdes as a paralytic who could only be treated by miracle. While taking her first bath, "in a few moments," we are told, "she felt cured. Without the least hesitation she could get out of the bath, stand on her feet, sit down, or walk about, and full powers of sensation had returned to all parts. All the doctors who had had the treatment of Mlle. Blondel gave a confident opinion that this was a supernatural cure." (*Lourdes*, p. 238.)

Another famous case is that of Pierre Delannoy, who was cured during the national pilgrimage of 1889. Dr. Boissarie writes characteristically of this case as quoted by Barbé (pp. 89, 90):

"Is the man we saw at Lourdes on the 20th and 22nd of August, 1889, verily the man who, from 1883 to 1889, was sixteen times a patient in the several hospitals of Paris? A telegram from the Charité Hospital affirms that he is indeed the same. 'We have seen Delannoy four times this week. The physicians are staggered. He walks like a country postman.'

"The separate opinions of twelve hospital doctors, who have had Pierre Delannoy for six years under their care, were recorded at the time, and copied into the certificate of discharge which every patient receives on leaving a hospital. These several certificates, in complete order, and bearing their dates and seal of the administration, have been laid before us, and have enabled us to

draw up the pathological history of Delannoy so as to fix, in unquestionable order and sequence, the various periods of the case. . . . If doubt were possible in sight of unanimity so complete, the treatment to which Delannoy was subjected should give us certainty.

“Considerably more than a hundred operations, all of the same nature, some simply repetitions, were performed upon the patient during the six years. The diagnosis of his disease is written upon his back in characters unanimous and indelible! And this sufferer had, moreover, passed through the first and second periods of ataxia. He had entered upon the third, Dr. Charcot’s ‘paralytic period.’ At this stage the lesions of the marrow are irreparable; the nervous elements have diminished almost to disappearance; cure is all but impossible. In any case it could not be complete; partial restoration would be a matter of months and even of years. Yet Delannoy was healed completely on the 20th of August, 1889. He was healed, not in the bath, but kneeling upon the flagstones in front of the grotto, while the Blessed Sacrament passed before him.

“There he was with his forehead pressed upon the stone, which he most humbly kissed. And while the crowd prayed with one voice, ‘O Lord, heal us!’ this sick workingman also said aloud, ‘Heal me, if it is needful for me.’ Upon the instant he was conscious of a force constraining him to rise and walk. He rose alone, he walked without assistance, without trouble, without pain, with a complete and easy co-ordination of all the movements of his body.”

Now, this recovery of Delannoy and the speedy cure of Mlle. Blondel, extraordinary as they are, do not surpass many others on record for which there

is no reason for setting up a supernatural origin. A parallel case given by Dr. Myers from the experience of Professor Charles Buchanan, of Glasgow, is here in point (*Proceedings of the Society for Psychical Research*, June, 1893, pp. 191, 192). Professor Buchanan's patient was a woman about thirty-one years of age, who had been for some months at least practically a paralytic.

"She was not able," the Professor says, "to alter her position in bed without help, and this always gave so much trouble that she would have remained constantly in the same position if the attendants had not insisted on moving her to allow of the bedclothes being changed and arranged."

The woman had given up all hope of recovery and rarely took any food except when forced to do so.

Professor Buchanan, upon being called to take charge of the case, decided to treat it as a functional spinal trouble and not a real disease due to actual molecular disintegration.

"I went to her bedside," he tells us, "and said suddenly: 'I cannot do you any good unless you allow me to examine your back.' In an instant she moved slightly round, and I examined her spine, running my finger over it at first lightly, then more firmly, without her wincing at all. I then said: 'Get out of bed at once.' She declared she could not move. I said: 'You can move quite well; come out of bed,' and gave her my hand, when, to the surprise of her husband and sister, who looked perfectly thunderstruck, she came out of her bed

without any help at all and stood alone. I said, 'Walk across the floor now'; without demur she walked without assistance, saying, 'I can walk quite well; I knew you would cure me; my pains are gone.' She then went into bed with very little assistance, lay on her back, and declared she was perfectly comfortable. She was given a glass of milk, which she took with a relish, and I left the house having performed a cure which to the bystanders looked nothing short of a miracle."

Another of Boissarie's cases is that of a French soldier who is said to have been miraculously cured of blindness. In 1882 the eyesight of this soldier was so damaged by a fire he was helping to put out that at the end of three months he could not see at all. A doctor who treated him at the hospital of Dijon told the patient that he had "detachment of the retina in both eyes." For eight years he tried various remedies, but all in vain. In August, 1890, he betook himself to a convent. One evening after he had been to confession one of the convent sisters brought him a bottle of holy water of Lourdes. Full of confidence in its healing power, he touched his eyes with it, "and all at once," he tells us, "as quick as lightning" his sight came back to him, and after nine days of gradual improvement he could see perfectly.

A much more famous case is that of Henri Lasserre, a historian of Lourdes. It is described by Barbé (page 91) as follows:

"Henri Lasserre had hyperæmia, a congestion of the pupil. The two most distinguished oculists of the time

—Dr. Demarres and Girand-Teulon—having diagnosed the lesion of the retina, took all possible means to arrest its development. Absolute rest for the eyes, a change to the country, hydropathy, tonics—all were prescribed and all were taken without success. By degrees the sight grew weak, and at last failed altogether. Several months passed. M. Lasserre felt that he was growing blind. Trusting in God, he asked for some water of Lourdes, bathed his eyes in it, and was cured. His history of Lourdes was a hymn of thanksgiving.”

Bearing in mind the fact that all ophthalmic authorities admit that detachment of the retina is hard to detect and may in time cure itself, and the fact that we have no direct evidence that it existed during the years preceding the alleged cure, or disappeared wholly after it, we may reasonably conclude that the restoration of the sight in this case was due to natural causes and does not transcend what is attributable to such a source.

Another alleged miraculous cure recorded by Boissarie (pp. 287–305) is that of Sister Julienne. She was suffering from phthisis of considerable standing, it is claimed, and after bathing in the waters of the grotto was made perfectly whole.

It is well known that this disease sometimes, as it were, cures itself. “Complete arrest of the disease,” says the *Dictionary of Practical Medicine*, “is occasionally observed under the most unfavourable circumstances; such cases falsifying every rule of prognosis.” The tubercular growth sometimes dries up, remaining for many years without perceptible

symptoms, though plainly visible on post-mortem examination. We have no direct proof that Sister Julienne had any tubercular growth; or, granting that she had, that it wholly disappeared after the cure. The disease quite likely was a chronic nervous cough along with bronchitis and dyspepsia, and the marked improvement at the time of the bath was probably due to emotional stimulation attending the expected cure.

Instances of the alleged cure of atrophy, organic paralysis, ulcer, and cancer are included in these miracles of Lourdes. Many of them are certainly of an extraordinary character. But no one of them, so far as scientific evidence of its reality can be established, transcends the maxim laid down by Myers: "Whatever suggestion can cause, hysteria can cause; and whatever suggestion or hysteria can cause, suggestion can cure."

While Lourdes offers the most remarkable list of cures on record, this is largely due to the great number of patients who annually visit its waters and the greater faith in the treatment. There is no satisfactory evidence that the vision of the Virgin was anything more than a subjective hallucination or has anything more than a subjective connection with the cures.

From our survey of the different forms of healing that we have considered in this chapter we cannot help drawing the conclusion that in so far as the alleged cures can be verified as actual facts, they are adequately accounted for as the effects of the mind upon the body. In other words, they are all

to be explained on the principle of suggestion. An idea of the cure first became fixed in the mind of the patient and was actually responsible for the result. The patient accepted without reserve the teaching of his healer and then put forth all his energy to carry the teaching into effect. He followed out the well-known law that every idea if left to itself will "generate its actuality." All opposition to the idea was set aside by the argument or dogmatic assertion of the healer, or by some suggestion from within, and that left all the power of the organism to be concentrated upon the realisation of the imagined cure. The only difference between this method of cure and that of hypnotism is in this,—that the patient in the former case is wide awake, while in the latter he is more or less asleep.

All that there is of value in the Christian Science method of cure comes from Mental Science. The same is true of the Faith-cure in all its forms. What is distinctive in both is in violent opposition to all our present knowledge. The good that is common to all these methods of healing disease may be summed up as follows: "Do not worry about your troubles. Divert your attention to other and higher ideas. In this way you will reduce your ills to the minimum; and do all you can to regain health and strength." It is astonishing what the following out of these simple maxims will accomplish. There is nothing in them incompatible with the science of medicine, and the two methods should not rival each other, but work together in closer alliance.

There is no doubt that the mind plays a far greater

rôle in the cure of disease than is commonly supposed. Where there is no absolute lesion of a nerve the influence of the mind on the nervous system may reach almost any limit. And as the nervous system extends to all parts of the body, every organ under certain conditions may to an extraordinary degree be affected by its power. Psycho-therapeutics has by no means the prominence in our medical schools that it deserves. Although still in its infancy, it should become one of the chief reliances of the physician and should constantly be applied to the everyday affairs of life.

In the infancy of the race all remedies for disease were applied externally to the skin. Later they were often taken through the stomach. At a more advanced stage of knowledge they were frequently injected into the blood by the hypodermic needle. In the future one of the chief methods of treating disease will be a mental one. The mind will be taught to apply its healing power directly to the brain, the central station of the whole body.

CHAPTER IX

MIND-READING AND TELEPATHY

JUST as guessing at dice-throwing and other games of chance led to the formation of the theory of probabilities upon which all scientific inductions are based ; and as the hap-hazard fancies of the alchemists started investigations that resulted in the science of modern chemistry ; so the willing game, a popular drawing-room amusement of twenty-five years ago, aroused such a wide-spread interest in the study of unusual psychical phenomena that in the opinion of many it has led to the discovery of a new mode of transmitting thought. In this willing game somebody is selected to think intently about a certain act, while he puts his hand upon the shoulder of another member of the company and silently wills that he perform the act. The usual result is that if the act is a simple one, such as finding a concealed pencil or combing one's hair before a mirror, it will be done in a more or less satisfactory manner. Sometimes, indeed, the act is performed with surprising promptness. In the careful study of these cases it has been ascertained that where the agent, as one who starts the game is called, and the percipient are in personal

contact the latter is usually guided by the agent's unconscious influence.

For it is now generally admitted that every thought we think, whether we wish it or not, tends to express itself in some activity of our organism. This position was first established experimentally by Professor Joseph Jastrow and an account of his work was published in the *Popular Science Monthly* for April and September, 1892, under the title of "Involuntary Movements" (reprinted in his *Fact and Fable in Psychology*). He invented a delicately balanced instrument called an automatograph, which measures how much the hand or head, for example, moves when we look at a given colour, count the oscillations of a pendulum, read from a printed page, think of a locality, or perform any similar act. Many others have since experimented in a similar way and all seem to agree that every thought is not only accompanied by a corresponding brain activity, but also strives to express itself through some appropriate muscular activity. When the percipient in the willing game is blindfolded and put in personal contact with the agent by having his hand placed upon the agent's arm or shoulder, he will in all probability simply follow the actual muscular pressure at that point although no conscious intention on the part of the agent is leading him to the desired object. If the percipient is not blindfolded and not in contact with the agent, he will often skilfully read the face when that is visible.

For in spite of the fact that much has been claimed in the past for facial expression that is in-

consistent with the natural history of man and the laws of physiology, all admit that the prominent characteristics of one's intellect, feelings, and will are indelibly written upon the face. In early infancy, while the mental power is still latent, all that the face records is the presence of pleasure or pain. But as the mind develops, the muscles of the lips and mouth take on a form adapted to the ideas experienced,—those of the eye and nostril assume an appropriate mode of functioning and the facial lines become fixed and definite. Thus it is that what a person thinks and does automatically records itself upon the face. And it is not to be wondered at that some become so expert in reading this record that for many practical purposes they do not need to be told in words about its contents.

Some persons skilled at cards can tell by a glance at the face of their opponent what sort of a hand he holds — good, bad, or indifferent. Gamblers often risk their fortunes on this glance. In the willing game a skilful operator can judge with a high degree of accuracy from the countenance of his spectators whether the thing he is doing is the right or wrong thing toward the accomplishment of the end that they all have in common. It is of course assumed in this game that all are willing with all their power to have the experiment succeed. Hence their facial muscles express their feelings to a far higher degree than would ordinarily be the case when the record is being made without conscious effort.

These facts explain also, in large measure at least, the platform exhibitions of such noted "mind-read-

ers'' as Cumberland, Bishop, and Randall Brown. They all employed some form of personal contact. Frequently they took hold of the hand of the person whose thoughts they were to read and held it against some part of their own person. They probably possessed by nature great delicacy of touch, which was developed by training to such perfection that they were able by simple contact to interpret the slight movements of the hand muscles of others and thus divine their thoughts. It is altogether likely that all mind-reading of the ordinary sort is simply muscle-reading. So far as these experiences are concerned, the famous assertion of an eminent muscle-reader that all willing is pushing or pulling is not far from the truth. At all events there is no proof here of what is properly called thought-transference.

To prepare the way for a genuine case of this sort, we must first eliminate the very conditions that make the platform conjurer so successful. All possibility of personal contact must be removed and every opportunity to communicate by look, or gesture, or any other physical means now known to us must be cut off. Even the good faith of experimenters is not always to be relied upon. The glory of originating and perpetuating a successful fraud has great attractions for many minds and has been a sufficient motive to lead some astray who were otherwise above suspicion. Of course a case capable of adequate explanation by collusion stands self-condemned.

It may be well to observe at this point that we

are not dealing here with the subject of apparitions, or with clairvoyance. Those that believe in ghosts and haunted houses hold that communications are made to them through the ordinary channels of the eye or ear. The spirit of the deceased person takes up its abode in at least some quasi-material object and manifests itself through some one of the known senses. The primary idea about thought-transference is that communications are made by supernatural means. Clairvoyance is the clear seeing of things concealed from normal sight, especially what is happening at a distance. By means of this power it is alleged that some people see through stone walls, as well as down into deep caverns, and can tell what is transpiring on some remote planet. At all events it deals with impersonal facts—facts not communicated from one mind to another—and thus does not come within the realm of our present study.

The agent and percipient in a test of thought-transference should, if possible, receive from a third party the idea to be transferred, and the latter should select the idea by lot, or some similar method. He should select it in silence, write it down, and show it to reliable observers before handing it to the agent. The percipient should be blindfolded and in a separate room from the agent. No conversation should be allowed between them or with others.

Nearly all the recorded experiments made with approximate regard for these conditions have been published in the *Proceedings of the Society for Psychological Research*. A few of those generally regarded by the best authorities on the subject as standard

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cases will here be given, beginning with the experiments made when the agents and percipients were in the normal wakeful state and also with the simplest kind of experiments, namely, those with cards and drawings. In an experiment reported by Malcolm Guthrie, of Liverpool, in which he was himself the agent and a Miss E. the percipient, the first six trials of a series in reproducing such simple diagrams as a circle, a square, a tuning-fork, a bird, and the like, were all successful. Out of 150 trials with various agents made by Miss E., the majority were successful entirely or in part.

At another time Miss E. and Miss R., of Liverpool, made 713 experiments with various agents in transferring ideas and sensations of all sorts; 461 were completely or partially successful and the rest failures.

A case often referred to under experiments of this sort in the normal state is one recorded by Dr. Blair Thaw, of New York. It was made April 28, 1892, Dr. Thaw himself being the percipient and his wife the agent. Not only were the percipient's eyes blindfolded, but the objects were so held as to be without his range of vision. Dr. Thaw also had his ears muffled and no other persons were present except Mrs. Thaw and a friend, Mr. Wyatt. The full record of these experiments made from notes carefully taken at the time is published in the *Proceedings of the Society for Psychical Research*, vol. viii.

From this record it appears that the first object taken, an orange-red silk pin-cushion in the form of an apple, was guessed as "A disc, red or orange,

a pin-cushion." The second object was a short lead-pencil covered with nickel. The percipient guessed: "Something white or light, a card. I thought of Mr. Wyatt's silver pencil." For a third object a dark violet in Mr. Wyatt's buttonhole was taken. The guess was: "Something dark. Not very big. Longish, narrow, soft," etc. The fourth object was a watch, dull silver with filigree, and the response was: "Yellow or dirty ivory. Not very big. Like carving on it." Then playing-cards were taken. The first object was the king of spades. Guess, "7 of spades." Second object 4 of clubs. Guess, "4 of clubs." Third object 5 of spades. Guess, "5 of diamonds." With numbers the first taken was 4. Guess, "4." Second number 6. Guess, "5 or 6." Third number 3. Guess, "3." Fourth number 1. Guess, "it is either 7 or 1." Fifth number 2. Guess, "9, 8."

Podmore in commenting upon this record is probably right in saying that while some of these experiments can be adequately accounted for, as in professional mind-reading, by indications unconsciously given by the agent and also in some instances unconsciously received by the percipient, yet a residuum remains to which such an explanation will hardly apply, especially where the perception came gradually and in a visual form. Still there is evidence to show that what is unconsciously received through one sense may give rise in consciousness to images of another sense. That is to say, I may unconsciously touch an object and then produce in consciousness an image of the object as

seen. Mr. H. G. Rawson, in vol. xi. of the *Proceedings*, gives an account of some experiments with two ladies, Mrs. L. and Mrs. B., that for correct card and diagram guesses has rarely been equalled in any tests of this sort in the normal state. And Miss X. has published in vol. vi. of the *Proceedings* a striking series of telepathic interchange of experiences over a long distance with Miss D. Each kept independent records made at the time the experiences occurred. Fourteen out of twenty of these entries refer to the consciousness of Miss D. that Miss X. was playing at that hour a definite piece of music.

The case of Madame Helena Blavatsky, who astonished the world with her claims to telepathic power some years ago, should here be mentioned. Madame Blavatsky was a Russian lady of repute who, having developed a remarkable passion for travel in search of occult knowledge, and having visited alone several parts of the Orient that were supposed to be inaccessible to foreigners, especially to women, came to New York in 1873 and organised the Theosophical Society. Her followers are numbered by the thousands in this and other lands, being perhaps most numerous in India, where she spent many of her last years, though she died in London in 1891. It was claimed by Madame Blavatsky that the idea upon which her society was based had been revealed to her by telepathic messages from certain Mahatmas, or "Brothers," who dwelt in the inaccessible fastnesses of the Thibetan Himalayas. She herself was simply their mouthpiece.

These Brothers, she asserted, being far removed from all contact with ordinary mortals, by untold generations of austere simplicity in their mode of life and ceaseless cultivation of their spiritual faculties, had attained an insight into the secrets of nature and a knowledge of the processes of the cosmos that no effort of man could possibly acquire. The revelations that they had chosen to make to her were first published in New York in 1877. Her now famous book containing them with some expositions of her own bore the title of *Isis Unveiled*. This book and the periodical called *The Theosophist*, which she edited, exerted so great an influence upon the world of thought that a society was formed in England in 1882, made up of eminent statesmen and scholars, to investigate her telepathic claims and other similar psychic phenomena. In 1884 the society, then known as the Society for Psychical Research, employed Dr. Richard Hodgson, a fellow of St. John's College, Cambridge, to go to India, where Madame Blavatsky was at that time gaining many adherents, study the case thoroughly, and report the facts. He found that the letters from Koot Hoomi, as the Master of these alleged saints in the Thibetan Himalayas was called, upon which Madame Blavatsky based her new religion, were written by herself or at her dictation. They were so placed that they could be discovered at such an opportune time as would convince her dupes of their genuineness. Sometimes these letters dropped down from the air, sometimes they were found in cushions and on trees, sometimes in the corners of private

drawers, or enclosed in envelopes as official telegrams.

Madame Blavatsky established a shrine in the headquarters of the sect at Adyar, India, where, it was alleged, notes to the Brothers were answered almost instantaneously. Mr. Hodgson gives a description of the shrine and its surroundings in his report. It appears to have been a small cupboard placed against the wall between the occult room and Madame Blavatsky's bedroom. A slide in the wall enabled her to insert in the cupboard a proper answer to any note she might extract from it. To inquire into the working of the shrine was of course regarded by its devotees as rank sacrilege.

Mr. Hodgson gives the following from his own experience while in conversation with two of Madame Blavatsky's accomplices:

"At this moment something white appeared, touched my hair, and fell on the floor. It was a letter. I picked it up. It was addressed to myself. M. and Madame Coulomb were sitting near me and in front of me. I had noticed no motion on their part which could account for the appearance of the letter. Examining the ceiling as I stood I could detect no flaw; it appeared intact. On opening the letter I found it referred to the conversation which had just taken place."

He afterwards ascertained that the letter had been inserted in a crevice in the ceiling with one end of a thread so loosely passed around it that when an assistant outside the room pulled the other end at a

given signal the thread gave way and let the letter fall.

From this and all the evidence we can gather on the matter we must conclude that the alleged telepathic communications of Madame Blavatsky with these so-called Brothers were based on forgery and fraud. In fact, in her own confession to Mr. Solov-yoff, published after her death, she says herself in justification of her course: "What is one to do when in order to rule men it is necessary to deceive them?" In spite of all this Madame Blavatsky was a truly remarkable personality. Many of her psychological experiences were extraordinary. But probably the injury to her spine received in falling from her horse in Thibet, in consequence of which she led for eighteen months a dual existence, had much to do with their abnormal character.

Before leaving these alleged evidences of telepathy in normal wakefulness it should be added that of the many hundred cases examined by the careful and unbiassed investigators of the Society for Psychical Research, including forewarnings of impending disaster, notification of the death of friends transmitted instantaneously from the most distant parts of the earth, letters identical in character crossing each other in transmission, and the like, not one of them has been considered as proved. The proper documents to substantiate them have not been forthcoming, even when the writing of such documents was a part of the case in question.

Of all the cases of alleged telepathy in ordinary sleep, Podmore, in his *Studies in Psychical Research*,

selects the following, reported by Dr. Ermacora of Padua, as the most characteristic: The agent was Signorina Maria Mangini, living with her mother in Padua, and Angelina Cavazzoni, a little cousin of the agent living in the same house with herself, but sleeping in an adjoining room. After Angelina went to bed, Dr. Ermacora would impress upon the mind of Maria, who passed into a somnambulistic state, a certain scene as of a regatta at Venice seen from the Rialto, and Angelina would relate the same as her dream in the morning. A drawing selected from a large number would be shown to Maria, and Angelina would select the right one when the whole set was handed to her in the morning. The successes generally attained in these trials were, according to Podmore, a very conservative critic, "decidedly greater than chance would account for."

The evidence for telepathy is undoubtedly greatly strengthened when we come to consider it from the standpoint of the hypnotic trance. It is claimed by some that telepathy, like hypnotism, is a reversion to a primordial condition which has now been outgrown by the normal individual, and therefore we ought to expect that it would be noticeable in hypnotic subjects. Others say that as suggestion is the characteristic feature of hypnotism, it is natural that telepathy should most easily show itself in the hypnotic state. At any rate, the fact is that hypnotism is remarkably favourable to telepathy, as will be seen when we examine some of the typical cases now carefully recorded for our study. In 1889 Professor and Mrs. Sidgwick conducted a care-

ful series of experiments in the transference of numbers with G. A. Smith as the agent and hypnotist. The hypnotised subjects sat in the same room with the experimenters a few feet away with their faces toward the wall. The numbers were drawn from a bag by Professor Sidgwick and handed to Mr. Smith to gaze at. Six hundred and forty-four trials were made with four percipients. Of these 117 were entirely successful, while 14 more were correct as to the digits, but they were not in the right order. The probable number of successes by chance would have been only 8. There were also 218 trials made with the percipients in different rooms. Of these 9 were successful, 3 being the probable number by chance.

Later trials were made by using mental pictures instead of numbers. The subjects were such things as a mouse in a trap, a choir boy, a baby in a carriage with a nurse. In 31 out of 71 such trials, when Mr. Smith and the percipient were in the same room, the percipient succeeded in giving an accurate description of the supposed object. When the percipient was in a different room, only 2 out of 55 trials succeeded (*Proceedings of the Society for Psychological Research*, vols. vi. and viii.). The only normal way for Mr. Smith to communicate to the percipients was by unconsciously whispering. This was especially guarded against by the experimenters and no sign of it was discovered. The numbers guessed in the failures did not sound like the right ones, as would have been the case, even if, as some alleged, Mr. Smith was whispering with his lips closed and

the percipients were in a state of hyperæsthesia as to their hearing powers.

Mrs. Sidgwick also conducted some experiments at Brighton in conjunction with Miss Alice Johnson, where Mr. Smith was agent and the percipients were in different stories of the house. The agent and the percipients were closely watched and hearing made practically impossible. Out of 252 trials with double numbers 27 were completely successful and 8 nearly so (*Proceedings of the Society for Psychical Research*, vol. viii.).

A series of successful experiments in guessing drawings in the hypnotic state is reported in *Proceedings of the Society for Psychical Research*, vol. v., by Professor Richet. He found also that his subjects made 30 correct guesses out of 180, when the drawing was enclosed in an envelope and unknown to any one except the person enclosing it, who was absent when the guesses were made.

There are many cases recorded in which the power of the telepathic impulse is said to show its direct effect upon the organism itself. Among the experiments of Mr. Edmund Gurney in which Mrs. Sidgwick also took an active part is the following: The subject, after being hypnotised, had his hands put through a hole in a high screen so arranged that he could not see them. The agent concentrated his thought upon one particular finger and willed it to be rigid and insensitive. Such was the fact. The percipient did not know what finger was to be selected and could not by his own conscious effort produce any such result. Some cases of table turn-

ing are thought to be due to the unexpressed volition of a person at a distance from the table which has so affected the minds of the sitters that they have involuntarily brought the movement about.

Professor William James, while admitting the fragmentary character of much of this kind of evidence and also that many reported experiments are not entirely faultless, does not hesitate to say: "The mass, however, is decidedly imposing, and if more and more of this solitary kind of evidence should accumulate, it would probably end by convincing the world."

When we come to examine the cases of telepathy at long distance the number is not imposing, but quite the opposite. But since it is true of all the forces that we know anything about that they diminish in intensity according to distance, it ought to be expected that the same would be true of this. Then, too, the time and trouble necessary to conduct experiments of this sort would naturally lessen the number. Still the few cases we do have throw an unusual amount of light upon our subject.

Take the case reported by Dr. W. A. Hammond, which he describes as follows:

"There is a subject upon whom I sometimes operate whom I can shut up in a room with an observer, while I go into another closed room at a distance of one hundred feet or more with another observer. This one, for instance, scratches my hand with a pin, and instantly the hypnotised subject rubs his corresponding hand and says, 'Don't scratch my hand so,' or my hair is pulled, and immediately he puts his hand to his head and says,

'Don't pull my hair,' and so on, feeling every sensation that I experience'' (quoted from Mason's *Telepathy and the Subliminal Self*, p. 37).

Here the definite sensations of one person are perceived by another person one hundred feet away through at least two partitions, all ordinary modes of communication being cut off.

One of the most famous cases of alleged telepathy at a distance is that of Madame B., of Havre, France. Twenty-five trials were made with her without her knowledge between October, 1885, and May, 1886. Eighteen of these trials were completely successful and four practically so. There is little room, therefore, for explaining them on the theory of chance. In some of these trials Dr. Gilbert, an eminent physician of Havre, was the agent; in others, Professor Pierre Janet, of the same city. At several of them Dr. Frederic W. H. Myers and his brother, Dr. A. T. Myers, were present, and the former published an account of the experiments they witnessed in the *Proceedings of the Society for Psychical Research*, vol. iv. The fifth and sixth are here quoted and fairly represent them all:

“(V.) On the 23rd, M. Janet, who had woke her (Madame B.) up, and left her awake, lunched in our company, and retired to his own house at 4.30 (a time chosen by lot) to try to put her to sleep from thence. At 5.5 we all entered the salon of the Pavillon, and found her asleep with shut eyes, but sewing vigorously (being in that stage in which movements, once suggested, are automatically continued). Passing into the talkative

state, she said to M. Janet: 'C'est vous qui m'avez fait dormir a quatre heures et demi.' The impression as to the hour may have been a suggestion received from M. Janet's mind. We tried to make her believe that it was M. Gilbert who had sent her to sleep, but she maintained that she had felt that it was M. Janet.

"(VI.) On April 24th, the whole party chanced to meet at M. Janet's house at 3 P.M. and he then, at my suggestion, entered his study to will that Madame B. should sleep. We waited in his garden, and at 3.20 proceeded together to the Pavillon, which I entered first at 3.30, and found Madame B. profoundly sleeping over her sewing, having ceased to sew. Becoming talkative, she said to M. Janet: 'C'est vous qui m'avez commandé.' She said she fell asleep at 3.5 P.M."

Experiments of a similar nature on various subjects have been successfully made by Ochorowitz, Richet, Hericourt, Dufay, Latour, and many others, the distance through which the willing power was successfully exerted being gradually extended from an adjacent room to a distant part of the city.

But the evidence for telepathy reaches its climax in the now famous case of Mrs. Piper, of whom Professor William James of Harvard says: "This lady shows a profound intimacy, not so much with the actual passing thoughts of her sitters as with the whole reservoir of their memory or potential thinking"; and he asserts of himself that he is "as convinced of the reality of the phenomena in her as he can be convinced of anything in the world." Mrs. Piper is a Boston lady who first attracted the attention of Professor James in 1885. He had sittings with her

many times alone that year, sometimes also in company with his wife, and once he took with him Rev. Minot J. Savage. He also sent a large number of persons to have sittings with her and in no case were their names announced to the medium. A report on these experiments was published by Professor James in the *Proceedings* of the American branch of the Society for Psychical Research for 1886.

Mrs. Piper's fame soon reached England, and in 1887 Dr. Richard Hodgson was sent over to this country to examine the case and make a report upon it. In order to assure himself that neither Mr. nor Mrs. Piper took any means to find out the history or condition of possible sitters, he had them both carefully watched by detectives for several weeks, but nothing of the sort was discovered. He was entirely convinced of the genuineness of the phenomena, and in 1889 he arranged to have Mrs. Piper go to England and give sittings under the auspices of the Society for Psychical Research. To avoid all possible suspicion of fraud, she was met at the landing by Professor Lodge, who had her baggage carefully examined for any data that might bear upon the object of her visit, or help her in the interviews she was expected to give. All her correspondence while she was in the country was read, and all her movements were kept under the close inspection of the members of the society at whose homes she was entertained. Mrs. Piper has been at the service of the Society for Psychical Research for over fifteen years (a part of the time on a small salary), giving sittings to persons who were not members as well as to those

who were. Yet not the slightest circumstance has ever arisen reflecting upon her honesty.

The name of the person who purports to be speaking through Mrs. Piper in her trance is usually "Dr. Phinuit," perhaps a name accidentally selected to represent her trance personality. Generally what Dr. Phinuit says is trivial and often irrelevant, but at times it is just the reverse. Information known only to the sitters, even long-forgotten bits of family history, detailed descriptions of deceased friends, their personal and intellectual characteristics, diagnoses of diseases of absent persons wholly unknown to Mrs. Piper but known to the sitter, and such-like matters will pour forth in great abundance to the utter astonishment of all.

The case of Mr. J. T. Clarke was the first to attract special attention. He had a long sitting with Mrs. Piper in the house of Professor William James, September 20, 1889. The control not only told him a great many things about himself and family as well as his business troubles that no one knew but himself, but also asserted some things he denied on the spot which were afterwards found to be correct. Among others, that he had some red-stamped checks in his pocket that would be of use to him. The words of the control were: "What are these tickets that you have in your pocket? There are figures on them stamped in red, and they are signed with names underneath. They will be of value to you; you will get something out of them." "No, I have nothing of the kind in my pocket," replied Mr. Clarke. Afterwards Mr. Clarke found on examination that

he actually had in an inside pocket two checks endorsed on the back as described and stamped with large red numbers. It is hard to account for this incident except on the theory of telepathic transference of ideas latent in the mind of Mr. Clarke.

Professor Lodge had a similar experience with an old watch which he handed to Mrs. Piper when in a state of trance. Dr. Phinuit told many truthful, but unusual and curious things about its history that Professor Lodge himself could not recollect; and if he had ever known them at all he had heard them in his early boyhood. In scores of other instances, according to Professor Lodge, Mrs. Piper's control reproduced details that were "unknown to, or forgotten by, or unknowable to, persons present."

Some years ago a personal friend of Dr. Hodgson, a writer of some note by the name of George Pelham, residing in New York City, made a promise that if he (Pelham) died first and continued to exist, he would make every effort possible to communicate with him. This friend died in February, 1892, and in March of the same year, when one of Mr. Pelham's friends was having a sitting with Mrs. Piper, Dr. Phinuit claimed that he was simply acting as a medium for George Pelham. Entirely without Mrs. Piper's knowledge a large number of Pelham's friends had sittings under assumed names. In no case did George Pelham as control fail to recognise them and call them by their right names. The knowledge that Mrs. Piper in this trance state had of the personal affairs of Mr. Pelham, his manuscripts, his

property, his associates, and especially his relation to Dr. Hodgson—a knowledge communicated both by voice and by writing—was so full and accurate that no doubt was left in the minds of the sitters, including Dr. Hodgson, that Mrs. Piper had extraordinary telepathic powers.

There was published in 1901, as volume xvi. of the *Proceedings of the Society for Psychical Research*, a remarkable work of some 650 pages by Professor James H. Hyslop, of Columbia University, giving an account of his experiments with Mrs. Piper. They began in December, 1898, and continued at irregular intervals for about a year. The sittings were known only to Dr. Hodgson and Mrs. Hyslop and were not arranged for by Mrs. Piper when in her normal condition, but in her trance state. Professor Hyslop sat under the assumed name of Mr. Smith and wore a mask. Mrs. Piper did not hear his voice even, except while in a trance. The sittings were conducted in an ordinary room in open daylight and not confined to Mrs. Piper's house alone. Everything was done to lessen the importance of the way of obtaining the communications and to fix the attention solely upon their content. After each sitting, usually in the afternoon of the same day, the notes made at the time were revised by Dr. Hodgson and Professor Hyslop and sent to the printer. Among the principal persons who purported to communicate with Professor Hyslop through Mrs. Piper were his father, Robert Hyslop, who died on the 29th of August, 1896, his little brother Charles, who died in 1864, and a sister Anna, still younger, who died

the same year. His mother, an uncle, and a cousin occasionally appear according to the record. All the communicators were dead at the time of the first sitting.

Professor Hyslop's purpose in conducting these experiments was to establish personal identity after death. We are now to examine the record solely for evidence of supernormal or telepathic power. One of the most consistent of all the alleged communications from Professor Hyslop's father as Mrs. Piper's control was made at the sitting on December 26, 1898 (page 333):

"And long before the sun shall set for you I will give you a full and complete account of your old father, James. Keep quiet, do not worry about anything, as I used to say. It does not pay. Remember this? (Smith: Yes, father, I remember that well.) That, James, was my advice always and it is still the same. You are not the strongest man, you know, and health is important for you. Cheer up now and be quite yourself. (Smith: Yes, father, I shall. I am glad to hear this advice.) Remember it does not pay and life is too short there for you to spend it in worrying. You will come out all safe and well and will one day be united with us and we shall meet face to face and you will know me well."

And much more to the same effect.

Professor Hyslop asserts that many of the phrases in the above, such as "Do not worry," "it does not pay," "life is too short," "will one day be reunited," are "exactly what my father constantly used to me in life. . . . Hundreds of times he has warned me that I am not so strong as some men."

At another part of the same sitting Mrs. Piper's control goes on:

"James, are you still here? If so, I want very much to know if you remember what I promised you. (Smith: Yes. I hope you will tell me what you promised.) I told you if it would be possible for me to return to you I would (Smith: Yes, I remember.) and try and convince you that I lived. I told you more than this and I will remember it all. I told you I would come back if possible . . . and let you know that I was not annihilated. I remember well all our talks about this life and its conditions, and there was a great question of doubt as to the possibility of communication, that if I remember right was the one question that we talked over" (page 325).

Near the close of this sitting Smith asks of the control: "Do you know what the trouble was when you passed out?" "No," answers the control, "I did not realise that we had any trouble, James, ever. I thought we were always most congenial to each other." Smith then explains that he meant sickness, and the control immediately replies: "Yes, my stomach," and gives a detailed account of a last sickness, concluding as follows (page 332): "Do you know the last thing I recall is your speaking to me. (Smith: Yes, right.) And you were the last to do so. (Smith: Very well. Was any one else at the bedside?) I remember seeing your face, but I was too weak to answer." Professor Hyslop asserts that he was present at the death of his father and that this representation of it is correct. "When his eyelids fell," he adds, "I exclaimed, 'He 's gone,' and

was the last to speak. Father had been unable to speak for more than an hour" (page 36). In the sitting of December 27th the control asks: "What do you remember, James, of our talks about Swedenborg? (Smith: I remember only that we talked about him.) Do you remember of our talking one evening in the library about his description of the Bible?" (page 241).

Notwithstanding the confusion and irrelevancy of a large part of these communications and many others given in the record as coming from Professor Hyslop's father, Mrs. Piper's control correctly stated the name of Professor Hyslop's father, Robert Hyslop, as well as of himself and his several brothers and sisters, making a truthful distinction between those that were dead and those that were living. He also correctly stated that his father was a "little elderly gentleman, that he could only whisper, that he had no teeth, and that he could not sing." He told the truth about his father's worry over finances at the time of his death, and his inability, owing to the complete failure of the wheat crop that year, to have the farm fences repaired for lack of funds. He described accurately the religious habits of thought of his father and the symptoms of his last sickness and many other incidents in his history that were clearly recalled by Professor Hyslop.

Correct references were also made, says Professor Hyslop, "to the trouble with the left eye, the mark near the ear, the thin coat or dressing-gown he wore mornings, the black skull cap, the tokens, the stool,

the writing-pad, the rests, and the round and square bottles on his desk, the paper-cutter, his diary, the brown-handled knife, and the nail paring, and the horse Tom in connection with George," though, he continues, they were "all but the tokens, the diary, and the last incident wholly unknown to me" (page 88).

At the sitting on May 31st Mrs. Piper's control purported for a few moments to speak as Professor Hyslop's brother Charles. He says:

"James, I am your brother Charles and I am well and happy. Give my love to the new sister Hettie and tell her I will know her some time. Father is . . . often speaks of her. . . . If you could only see his delight when he hears you, I am sure, my dear brother, you would never doubt that he still clings to you. It is his one desire to comfort and help you" (page 101).

Charles died in 1864 and the new sister Hettie was born in 1874. He speaks of her in full accord with the facts. So also he correctly characterises the chief purpose of the father.

During the sitting of December 23d Mrs. Piper's control, purporting to speak for Professor Hyslop's sister Anna, says: "Where is brother James? (Smith: I am brother James.) How you have changed since I came here! Do you remember anything about my hair? . . . Do you not have anything to say to me? I came here just after Charles" (page 331). "My sister Anna," says Professor Hyslop (page 105), "died twelve days after my brother Charles in 1864 with scarlet fever." Mrs.

Piper's control tells many other facts concerning the names, relationships, and doings of the Hyslop family in this small town in Ohio, no one of which have we any reason to suppose was known to Mrs. Piper in her normal state. We are not attempting to account for all the facts recorded as occurring in these sittings or to explain fully those referred to above, but only to show that they must have been attained by supernormal means. If true, and we have no good reason for calling them in question, they seem to establish the fact of telepathy beyond reasonable doubt.

Another and more recent case should be added to those already cited, namely, the case of Mrs. Thompson. She is the wife of a wealthy importer in London and was born in Birmingham in 1868. It was not till about 1896 that she began to realise that she possessed unusual powers, and two years later she and her husband made the acquaintance of Frederic W. H. Myers, who took a deep interest in them both. So far from being of a morbid disposition, Mrs. Thompson is active and vigorous, fond of social life and outdoor sports. The only reason she has for giving sittings to any one is to help on the progress of knowledge. Her trances seem to be almost as easy and natural as ordinary sleep. She has given sittings to Dr. Myers, Professor Lodge, to Sir William Crookes, Professor and Mrs. Sidgwick, Dr. Hodgson, and other members of the Society for Psychical Research Council, but most of her best sittings have been with entire strangers.

Three fairly successful sittings were had with Dr.

Frederick Van Eeden, of Bussum, Holland, of whom it is claimed Mrs. Thompson knew nothing at all. From notes taken at the time by J. G. Piddington, Mrs. Thompson's control in the first sitting gave Dr. Van Eeden's name, Frederick, correctly and alluded to his profession. In the second sitting she gave the Van Eeden in full, the name of his country, and the Christian name of his wife, Martha, and of one of his children; and in the third sitting the name of his home, Bussum.

A gentleman well known in England as a discreet and cautious observer, who for family reasons passes in this record as Mr. J. O. Wilson, had two sittings with Mrs. Thompson (*Proceedings of the Society for Psychological Research*, vol. xvii., p. 128 *seq.*). Mr. Wilson says in his statement about the case: "I have never met Mrs. Thompson before, between, or after the two sittings." The lady mentioned in the sittings as Miss Clegg was at the time of her death Mr. Wilson's fiancée. Mrs. Thompson's control amid a great mass of confused and apparently irrelevant statements correctly gave Miss Clegg's Christian name, accurately described where she lived, and correctly named several of her friends, besides giving a number of facts concerning the affairs of herself and family known to no one present but Mr. Wilson. Miss Clegg's sister a year after the sittings, on carefully reading over the notes, joins with Mr. Wilson in saying that "the number and character of the facts correctly stated are very remarkable."

The above are the best records of sittings with Mrs. Thompson yet published. The six sittings

with Dr. Hodgson in his opinion showed no supernormal power. But the sittings taken together seem in some respects to be on a par with those of Mrs. Piper and establish as at least a good working hypothesis the existence in some minds of telepathic powers. We are not arguing one way or the other from these cases as to whether any communications have come directly from "departed spirits," but simply that some information was probably obtained through means now unknown to us from the minds of the sitters. It is immaterial from our present standpoint whether the different controls of Mrs. Piper were actually different existences or modifications of the personality of Mrs. Piper, and so of Mrs. Thompson. The only point now under consideration is, did they get their information wholly through normal means? The evidence seems very strong that they did not. Hence we are inclined to admit the possibility and probability of some exceptional or supernormal means.

But this does not militate against the view that mind, so far as we know it, always manifests itself through some material organism or instrument. Certain things have heretofore been regarded as necessary for the proper transmission of electricity, but now we have wireless telegraphy. That does not mean, however, that electricity requires no medium at all. The mechanism and function of the brain and nervous system are still imperfectly explored. No one is yet justified in asserting that undulations of ether cannot be conveyed from brain to brain over any of the distances of our earth. The

admission of telepathy simply requires us to acknowledge that we have not yet discovered all the ways for mind to communicate with mind. While it is the one ultra-normal faculty to the reality of which many students of psychical research now assent no one claims to have discovered its laws or to be able to define its meaning and scope. It may always remain an isolated fact. It may also turn out to be but one of a series of at present unrecognised human powers.

CHAPTER X

THE HYPOTHESIS OF A SECONDARY SELF

THE first eminent representative of the doctrine of a secondary or subliminal self was the late Frederic W. H. Myers, for many years the efficient Secretary and at the time of his death the much-lamented President of the Society for Psychological Research.

After years spent in the study of unusual mental experiences he came to the decided opinion that "the stream of consciousness in which we habitually live is not the only consciousness in connection with our organism." "I accord," he says, "no primacy to my ordinary waking self except that among many potential selves this one has shown itself the fittest to meet the needs of common life."

This subliminal self, in his opinion, can never express itself completely through any corporeal manifestation. It exists and has a conscious life of its own below the threshold of the habitual consciousness. It shows its activity by reviving processes that fall below the red lines of the ordinary conscious spectrum, because they long ago dropped out of the range of present human knowledge; and at the same time it gives us glimpses of other processes above

the violet lines which we are obliged to attribute to supernormal powers. In addition it is to be traced along the range of the ordinary spectrum itself, re-enforcing our conscious wakeful life with flashes of inspiration which cannot be attributed to any other source.

This position has come to have many advocates, and it derives its support from a large number of carefully recorded facts, which can no longer be safely ignored by any student of psychology who wishes to retain the confidence of his fellows for breadth of view and honesty of purpose.

For convenience we shall first examine the extraordinary facts bearing upon our subject that occur in connection with the use of our usual normal powers. These facts, it is alleged, cannot be accounted for except on the assumption that the faculties of our wakeful state have been intensified in their action by uprushes of energy from depths far below the sphere of our conscious selves.

In many respects the most striking cases of this sort are the so-called arithmetical prodigies that every few years in the course of history have astonished and entertained the world with their extraordinary feats. Some of these "lightning calculators" have solved almost instantaneously in their heads problems that other individuals would require many minutes to work out with pencil and paper, provided they possessed ability enough to solve them at all. Dr. Scripture, of Yale University, in his paper on "Arithmetical Prodigies," published in the *American Journal of Psychology* for April, 1891, gives a

table of the principal prodigies of this sort and some account of their history and mental characteristics. From this record we find that nearly all of these calculating wonders developed this extraordinary power in early childhood and lost it as they grew older. Many of them were actually stupid as to their general intelligence and remained so all their lives. Few of them knew anything about geometry or had any really mathematical ability at all. One of the two or three actually eminent persons in this list was Archbishop Whately, who says of his own power in this direction:

“It began to show itself at between five and six and lasted about three years. . . . I soon got to do the most difficult sums, always in my head, for I knew nothing of figures beyond numeration. I did these sums much quicker than any one else could upon paper, and I never remember committing the smallest error. When I went to school, at which time the passion wore off, I was a perfect dunce at ciphering, and have continued so ever since.”

Professor Safford at ten years of age could work correctly in his head in one minute a sum in multiplication whose answer consisted of thirty-six figures, but later he displayed no unusual ability in such matters. Vito Mangiamiele, a shepherd boy of Sicily, was taken to Paris in 1837 when he was ten years old and examined before the French Academy of Sciences by Arago, the famous astronomer. He put to the boy the following questions: “What is the cube root of 3,796,416?” In half a minute

Vito gave the correct answer, 156. The next question was: "What satisfies the condition that its cube plus five times its square is equal to 42 times itself increased by 40?" In less than a minute the boy gave the answer 5, which is correct. The third problem was the equation $x^5 - 4x - 16779 = 0$. At first Vito answered 3, but afterwards changed it to 7, which is the true solution. Finally he was asked to give the 10th root of 282,475,246, and in a short time he responded correctly, "7." How he solved these problems still remains a mystery and we have no reason to suppose that the boy himself could explain it.

Of Dase, the celebrated German calculator, we are expressly told that "Peterson tried in vain for six weeks to get the first elements of mathematics into his head," and that "he could not be made to have the least idea of a proposition in Euclid. Of any language but his own he could never master a word." In the case of Colburn "his friends tried to elicit a disclosure of the methods by which he performed his calculations, but for nearly three years he was unable to satisfy their inquiries. He positively declared that he did not know how the answers came to him." When he did endeavour to make an explanation the attempt did not succeed. The famous boy calculator, known as "Mr. Van R. of Utica," entirely lost this power at eight years of age and could reckon no better than the average individual. In after life, we are told, "he did not retain the slightest idea of the manner in which he performed his calculations in childhood." Inaudi, the present

world wonder in this direction, will multiply a row of nine figures by another row of nine and keep on talking freely about other matters until he announces the result. Buxton used to do the same thing, the talking "being no molestation or hindrance to him."

In all these cases the principal thing for these calculating wonders to do was to get a clear and vivid conception of the problem at the start and then leave the result to come of itself. They were seldom conscious of any continuous logical process. According to the advocates of the doctrine we have under consideration, most of the process is the work of the subliminal self. The conscious self simply begins the operation and the subliminal self carries on the successive steps, attains the conclusion, and brings the result up into the consciousness of the ordinary wakeful self. It is all due, so it is alleged, to the sudden uprush of a mind "which kindles the bright lines at least of our habitual spectrum into a more than common glow."

But another explanation of these phenomena is possible and should be adopted if it will fairly well account for the facts. For it is here taken for granted that a physical theory is to be accepted in all cases where it can be applied, and that a new psychological theory is to be admitted only after every existing hypothesis has failed to meet legitimate demands. It is entirely reasonable to hold that these so-called lightning calculations are chiefly automatic and only require a low degree of mental power. Complex arithmetical problems are now

solved every day by calculating machines. The operator "sets" the conditions of the problem and the turning of a crank does the rest. We must not forget that the brain of man is a vastly more complex and delicately balanced organ than any machine can be. Its association tracts respond to the slightest influence. Let any set of cells be started into action and all related sets at once respond. It is notorious that all purely arithmetical calculations require but little outlay of mental energy. It seems altogether likely, therefore, that in these cases that we now have under consideration the ordinary normal mind using the appropriate brain cells sets the problem; that the brain itself makes the proper combinations according to its own laws with very little mental guidance; and that the ordinary normal self reads the result. In short, that in so far as they are unconscious to the so-called normal self they are physical and automatic, to be explained in accordance with the general laws of physical force. Some brains take on this particular mode of functioning far more easily than others, but the difference is probably one of degree and not of kind. People differ almost as much in the facility with which they take to dancing or manipulate a piano or violin.

In the same way we would explain the improvised productions of musical composers and the inspirations of the orator and poet. They are made up of the materials that at some time or other have been treasured up by memory in the cerebral storehouse, ready on the appropriate occasion to burst forth. It is altogether likely that they are due in large

measure to brain activities which at first often require but slight attention, and only in their final stages spring up into clear and vivid consciousness.

Another alleged source of evidence for the existence of a secondary self is dreams. People often do with ease in dreams what they have tried hard to do while awake and failed to do; hence it is said that they must have been assisted by a subliminal power. Professor Lamberton, of the University of Pennsylvania, reports that after having worked for some days in vain over a geometrical problem he awoke one morning and saw the answer on the wall directly in front of him (*Proceedings of the Society for Psychical Research*, vol. xii., p. 11). His colleague, Dr. Hilprecht, Professor of Assyrian, dreamed that a tall, thin priest of Bel came to him and told him how two pieces of agate that he had received from the temple of Bel at Nippur could be put together so as to make the inscription on them intelligible. In the morning he followed the directions given and deciphered them at once, although he had long laboured over them in vain. Agassiz discovered in sleep how to put some scattered bones together so as to make a complete skeleton, his previous efforts having met with no success. There are innumerable instances on record of the discovery of the whereabouts of missing articles in dreams.

In all these cases we have no right to claim that the processes involved were due to a secondary self merely because we cannot recall the processes when we awake. Some of them in all likelihood were purely automatic. Some were so quickly experi-

enced that the consciousness of the operation almost immediately faded away. Others are to be explained as mere revivals of lapsed memory due to the sudden stimulation of the nerve tracts in which the memory was stored, while others, still, may be accounted for as clear presentations in consciousness of what was originally apprehended in a vague and fragmentary way. We must always remember that every state of consciousness is an extremely complex affair, made up of a great number of unlike elements, any one of which may push to the front and monopolise the field of vision; that all degrees of consciousness are possible; and that the processes of thought often go on with lightning-like rapidity and pass into temporary oblivion with an almost incredible swiftness.

Passing now to a somewhat different set of facts, we come to the great historical cases that are supposed to establish beyond peradventure the existence of a secondary self. The first of these cases to attract special attention was that of the daughter of a French sea captain, by the name of Felida, who was born near Bordeaux in 1843. Her case was carefully studied for a number of years by Dr. Agam, of Bordeaux, who published a full account of it in 1887. He says that up to the age of fourteen Felida was a quiet child, subject to frequent pains and ailments of an hysterical origin. One day when sewing she fell asleep for a few moments and woke up a new creature. Her pains were gone. She was gay and happy, much given to singing and talking. After she had slept again she returned to her former

self and had no knowledge whatever of what she had been doing in the interim. In a day or two the same experience was repeated, and so it went on until in the prime of life she spent months together in this second state, only occasionally relapsing into her original self. She married and had a family of children, but during her entire life her experiences in the first state remained entirely distinct from those in the second.

As she grew older the second state predominated and became her usual self, superior in every way to her original self who always remained sickly and depressed. When she reverted to her old self she could not tell the whereabouts of her husband and her children. Says Dr. Agam: "She would not recognise the dog which played at her feet, nor the acquaintance of yesterday. She knew nothing of her household requirements, her business undertakings, her social engagements." In her second state she knew of the existence of such a personage as her original self, and when she thought she could not prevent her from appearing upon the scene of action she would write her a letter telling her how to conduct the affairs of the household, where to find certain needful articles, and how to treat certain visitors when they came to call.

A very similar case is that of the Rev. Ansel Bourne, of Greene, Rhode Island, vouched for by Professor James of Harvard University and Dr. Hodgson, both of whom have thoroughly investigated it. Mr. Bourne began life as a carpenter, but owing to some unusual religious experiences he

spent most of his time as an itinerant preacher. He was always more or less subject to headaches and temporary fits of depression and had been unconscious several times an hour or more because of them.

“On January 17, 1887,” says Professor James in his *Principles of Psychology* (vol. i., p. 391 *seq.*), “he drew \$551 from the bank in Providence, with which to pay for a certain lot of land in Greene, paid certain bills, and got a Pawtucket horse-car. This is the last incident he remembers. He did not return home that day and nothing was heard of him for two months. He was published in the papers as missing, and foul play being suspected, the police sought in vain his whereabouts. On the morning of March 14th, however, at Norristown, Pa., a man calling himself A. J. Brown, who had rented a small shop six weeks previously, stocked it with stationery, confectionery, fruit, and small articles, and carried on his quiet trade without seeming to any one unnatural or eccentric, woke up in a fright and called the people of the house to tell him where he was. He said his name was Ansel Bourne, that he was entirely ignorant of Norristown, that he knew nothing of shopkeeping, and that the last thing he remembered—it seemed only yesterday—was drawing the money from the bank, etc., in Providence. He would not believe that two months had elapsed. The people of the house thought him insane; and so, at first, did Dr. Louis H. Read, whom they called to see him. But on telegraphing to Providence confirmatory messages came, and presently his nephew, Mr. Andrew Harris, arrived upon the scene, made everything straight, and took him home. He was very weak, having lost apparently over twenty pounds of

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flesh during his escapade, and had such a horror of the idea of the candy-store that he refused to set foot in it again."

When he reached home and was in his normal condition Mr. Bourne knew nothing of his Brown experiences. But about three years later, after much effort, Professor James induced Mr. Bourne to submit to hypnotism. The result was that his career as Mr. Brown all came back to him and he knew nothing of his usual life as Mr. Bourne. When asked about Ansel Bourne he said that he "did n't know as he had ever met the man." And when introduced to Mrs. Bourne he said he had "never seen the woman before." "I had hoped," continued Professor James, "by suggestion, etc., to run the two memories into one and make the memories continuous, but no artifice could avail to accomplish this, and Mr. Bourne's skull to-day still covers two distinct personal selves."

It is altogether likely that in both of these cases the changes in ideas and associations were chiefly due to changes in the supply of blood to the brain. The sudden and irregular ebb and flow of the circulation would naturally cause some cells to wane in their action, while others would be stimulated to a great excess of power. This would undoubtedly account in the main for the severe headaches of which they both so frequently complained. The very fact that the brain was in an unusual condition would give rise to a new and strange set of sensations which might easily absorb the entire attention and

furnish data for the creation of a radically different conception of the self from the one that had before dominated the life.

For every person is perpetually changing his conception of himself with every new experience; and whatever conception is uppermost at any given moment will give tone and character to his thoughts and acts. He will tend to select out of his past memories the materials that fit in with this conception and ignore all others. In this way it is possible for one to have as many conceptions of himself as he has possible relations. Both in a normal and an abnormal state each conception may have its respective memories and modes of thought. And if his states change suddenly and radically his conception of himself will undergo a similar alteration.

Everybody's Me is therefore a complex affair. It is the sum total of all his possible Mes to which we can set no definite limit. Professor James goes so far as to assert that

"in the widest possible sense a man's Me is the sum total of all that he can call his, not only his body and his psychic powers, but his clothes and his house, his wife and children, his ancestors and friends, his reputation and works, his lands and horses, and his yacht and bank account. All these things give him the same emotions. If they wax and prosper, he feels triumphant; if they dwindle and die away, he feels cast down, not necessarily in the same degree for each, but in much the same way for all."

From this point of view even a savage has a number

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of selves. And every civilised man cuts himself up into as many social selves, to take only one line of cleavage, as there are groups of persons to whom he stands in distinct relations. And whenever he comes into any one of these relations the thoughts and conduct peculiar to that relation may come to the front and drive out all others. "Many a youth," says another, "who is demure enough before his parents and teachers swears and swaggers like a pirate among his 'tough' young friends," and it may be added that "his parents and teachers" equally alter their modes of thought and action with a changed environment. All of which goes to show that when an individual for any reason passes into a new state or condition having the thoughts and retaining the memories only of that condition, it need not be anything more than a greatly exaggerated example of what is all the time taking place in some degree in ordinary wakeful life, and does not necessitate the adoption of an entirely different self, of which we have no more direct knowledge than of an atom of oxygen or a distant star.

Most people are so situated that they boldly stand by some one of their empirical selves and at least keep the others in the background. But a few persons like the cases we have examined and still have to examine, owing to a diseased condition of the organism, or the suggestion of some other mind, or their own lack of will, vibrate from one to the other and do not have any abiding self to the supremacy of which they persistently devote all their powers.

The next test case is that of Madame B., the wife

of a charcoal burner near Cherbourg, of whom Frederic W. H. Myers wrote not long ago: "There is perhaps no one in France whose personal history is watched with so keen an interest by such a group of scientific men." In her ordinary state Madame B. is a timid elderly peasant woman, of moderate intelligence and little education. Professor Janet of Havre, who has thoroughly studied all phases of her case, calls her in this state Leonie. When she is hypnotised she at once becomes bright and vivacious, full of mischief, and very anxious not to be taken for Leonie, whom she calls "the other one," and laughs at for her stupidity. In this state she takes the name of Leontine. If she is hypnotised still further and put into a deeper trance, she is known as Leonore, who is acquainted with Leonie and Leontine and disinclined to regard either of them with much favour.

One day Professor Janet after hypnotising Leonie into Leontine told her on awaking to take off her apron, the joint apron of Leonie and Leontine, and tie it on again. She did as she was told and the Professor called Leonie's attention to the loosened apron, when she exclaimed, "Why, my apron is coming off," and tied it on again. While Leonie was talking about other matters connected with the Professor's departure, Leontine took the apron off again and again retied it. The next day when Leonie was hypnotised into Leontine, Leontine immediately said: "Well, I did what you told me yesterday. How stupid the other one looked while I took off her apron! Why did you tell her that her

apron was falling off? I was obliged to begin the job over again."

Once when Madame B. was away from Havre on a visit, Professor Janet received a letter from her about her state of health, written in a serious, respectful tone and signed by her true name; but over the page was another letter in a decidedly different vein, which read as follows: "My dear good sir, I must tell you that B. really makes me suffer very much; she cannot sleep, she spits blood, she hurts me; I am going to demolish her, she bores me, I am ill also. This is from your devoted Leontine." When Madame B. returned to Havre Professor Janet questioned her about the letters. She remembered the first one very distinctly, but of the second she had no recollection whatsoever. This experience was subsequently often repeated, and many others of a like character are recorded by Professor Janet with this subject.

A case that very strikingly resembles this one of Madame B. is reported by Dr. Morton Prince, physician for nervous diseases in the city hospital of Boston, Massachusetts, and described by him at the International Congress of Psychology, Paris, August, 1900, under the title *The Problem of Multiplex Personalities*. It appears that a certain Miss Beauchamp, a student in one of the New England colleges, finding that her health would not allow her to graduate, left her work and went to a hospital to fit herself to be a nurse. While in this hospital one summer evening in 1893 she experienced such a violent fright that she has ever since been an en-

tirely different person. No effort to restore her to her original self has met with success. But not only this, Miss Beauchamp No. I., as the person immediately after the fright is called, has developed into three other personalities besides three hypnotic states, and for several years these different personalities have been coming and going without any apparent law or order, each one claiming to be the real Miss Beauchamp and to have the sole right to existence to the exclusion of the others.

“B. I.,” says Dr. Prince, “is a very serious-minded person, fond of books and study, of a religious turn of mind, and possesses a very morbid conscientiousness. . . . Sally (Miss Beauchamp No. III.) on the other hand is full of fun, does not worry about anything; all life is one great joke to her; she hates books, loves fun and amusement, does not like serious things, hates church. . . . She cannot read French or any of the foreign languages which Miss Beauchamp knows, and she cannot write shorthand,—in short, lacks a great many of the educational accomplishments which the other character possesses. . . . Curiously enough Sally took an intense dislike to B. I. She actually hates her. She used to say to me, ‘Why, I hate her, Dr. Prince!’ and there was no length to which Sally would not go to cause her annoyance. She would play every kind of prank upon her to make her miserable. She tormented her to a degree almost incredible.”

Dr. Prince has succeeded in getting Sally Beauchamp, who is by far the most interesting of all the Beauchamps, to write her autobiography, and it

begins from the time she was in her cradle, which she distinctly remembers. She describes how she learned to walk and how frightened B. I. was when she started off. All the way through her childhood and school life she disliked the things B. I. liked, and she makes a very clear distinction between their thoughts and feelings on a great variety of subjects even up to the present time. Dr. Prince asserts that she also depicts actual scenes and incidents in her early life "of which Miss Beauchamp is entirely ignorant"; and concludes that "thus I have been able to get an actual autobiography of a subliminal consciousness, in which are described the contemporaneous and contrasted mental lives of two consciousnesses, the subliminal and the dominant, from early infancy to adult life."

These are of course most extraordinary cases, but we do not see in them sufficient reason for supposing that they require any other explanation than the doctrine already stated, namely, that the one human individual by various modifications of its own powers may create a variety of selves. It may even revive an almost extinct faculty, as Podmore and Patrick have pointed out. It may bring into service material stored up in brain tracts long in disuse and thus increase the number of possible combinations beyond any conceivable limit. Such being the facts, the cases described above are, in our judgment, best interpreted as extreme illustrations of how much the mind of man is like a kaleidoscope, which may be shaken now into this pattern and now into that, and not satisfactory evidence of the existence of two

fundamentally separate beings with distinct experiences and powers.

But before we have the material at present available for a well-grounded opinion upon this matter there are other cases that need to be considered, and especially what has been called "the epoch-making case of Mlle. Hélène Smith." This has been described with great lucidity and candour by Professor Flournoy, of Geneva, Switzerland, in his famous book entitled *From India to the Planet Mars*. Mlle. Hélène Smith is the name given by Professor Flournoy to a woman at the head of an important department of a large commercial house in Geneva, who has shown in recent years extraordinary mediumistic powers. The Professor first became interested in the case in 1895, and his book is a record of five years of observation and study that he has devoted to it. During these five years Mlle. Smith in her trance life has passed through three extraordinary cycles, known as the Hindoo cycle, the Martian cycle, and the Royal cycle. That is, she has successively been the daughter of a wealthy Arab sheik, living at the close of the fourteenth century, whom she left when eighteen years of age to become the wife of a Hindoo potentate; an inhabitant of the planet Mars, familiar with the life of its people, using their language, and absorbed in their thoughts; and most recently a reincarnation of the famous French Queen, Marie Antoinette. In all these experiences her spirit guide is "Leopold," who claims to be the reincarnation of Count Cagliostro, the notorious Italian physician and alchemist of the time of Louis XVI.

As the Hindoo Princess Simandini, H  l  ne is passionately devoted to her husband Sivrouka Nayaka, who reigns over Kanara and builds a fortress there called Tchandranguiri in 1401. At his death she is burned alive on his grave after the fashion of that country. The various scenes in this Oriental drama form a continuous series, but they were enacted in the reverse of the chronological order in harmony with the mediumistic theory that the memories of previous existence go back first to the more recent events and last of all to the more remote. The scene of the death on the funeral pile was enacted on the 10th of March, 1895; that of the visit to the palace and fortress in Kanara on the 7th and 14th of April; that of the betrothal on June 30th; and so back to the time when as a young girl she is joyously playing with her pet monkey or copying Arab texts for her father, the sheik.

Professor Flournoy says that these varied Hindoo somnambulisms are enacted with such perfection of originality and grace that only the most accomplished actresses could equal it after months of hard study or a long sojourn on the banks of the Ganges. H  l  ne, however, has had no artistic education and has lived from her infancy on the shore of Lake Lemman.

But the most wonderful thing about this Hindoo cycle of experiences is the use of Sanscrit and the references to historic facts. When H  l  ne announced herself as the wife of Sivrouka Nayaka, and the date at which he built the fortress Tchandranguiri as 1401, Professor Flournoy immediately

consulted all the eminent professors of history and Orientalists known to him for confirmation of these references, and not one of them was able to furnish him the slightest hint on the subject. One wrote: "Your names are unknown to me and do not recall to my mind any personage, real or fictitious." "The name of Sivrouak seems to me improbable as a Hindoo name," wrote another. "I greatly regret not to have succeeded in getting upon the trail of the recollections of your medium," wrote a third. But Professor Flournoy did not utterly abandon the search, and one day in a six-volume work by one De Marles, whom nobody reads in our time, he accidentally found this passage: "Kanara and the neighbouring provinces on the side towards Delhi may be regarded as the Georgia of Hindustan. . . . Tchandraguiri, which signifies Mountain of the Moon, is a vast fortress constructed in 1401 by Rajah Sivrouka" (*General History of India*, pp. 268, 269, Paris, 1828). De Marles gives no evidence for this statement and no author yet discovered refers to these facts.

The important question for us here is, Did Hélène know of this passage? Of this we have no proof. Professor Flournoy says that so far as he knows there are only two copies of this work in Geneva, both for a long time covered with dust, one in a private library to which neither Hélène nor her friends would have any access, and the other in the Public Library, but very rarely used. Hélène declares that she can remember nothing about such a work, has never heard before of such a man as De

Marles, has never studied the history of India or ever read anything on the subject. Of course the fact that she cannot now remember anything about it does not militate against the supposition that she has some time seen the passage in question, and even the possibility that she may have heard it read by others at some time in her childhood precludes in our view referring it to any superhuman source. For the same reason we would not attribute it to a subliminal self, but to the working of latent normal powers.

Now in regard to Hélène's ability so far as this Hindoo incarnation is concerned to speak with tongues. Notwithstanding the fact that she often had seances and spontaneous visions of her Arab days, she always described the scenes of her early life in French and showed no knowledge whatever of Arabian except to copy an Arab text. This can not be said of her Hindoo experience. She actually does utter certain Sanscrit words in expressing her deepest emotions, and this in spite of the agreement of all Sanscrit scholars "that Indian women neither at the time alleged (1401) nor at any other spoke Sanscrit; that the language of the place alleged (Kanara) was and is Dravidian, utterly different from Sanscrit; that it is incredible that a Mussulman Arab chief would marry his daughter to a Hindoo prince practising suttee."

It has been argued that H       acquired her knowledge of Sanscrit clairvoyantly through her subliminal self by a spirit. A better explanation is now possible. In a recent article giving observa-

tions upon this case down to 1902, Professor Flournoy tells us that in the study of one of Mlle. Smith's spiritist friends where she often gave her sittings has been discovered a Sanscrit grammar containing the characteristic words used by her in her trances. Hélène honestly denies that she has ever consulted a Sanscrit grammar, or has ever seen one. Still the fact remains that she has often had the opportunity of doing so and that her knowledge of Sanscrit is just what a quick eye and a good memory could have acquired in a few hours from such a source, especially when quickened by hypnotic suggestion to unusual power of concentration.

The first decided appearance of the Martian experience took place at the house of M. Lemaitre, also a professor in the University of Geneva, on the evening of November 25, 1894. Hélène perceives in the distance and at great height a bright light. She declares that she is ascending and soon announces that she is walking on the planet Mars. Then follows a description of the strange things she sees there: carriages gliding by emitting sparks, but without horses or wheels; houses with fountains on the roof; a child in a cradle just like our children; people that look exactly like the inhabitants of earth except that both sexes wear the same costume; a professor lecturing in a great hall to a vast assembly of youthful hearers.

Much later in another seance she attends a family *fête* on Mars, where the people salute each other by caressing the hair instead of shaking hands. At the banquet the tables are laid with square plates and

with forks having no handles. The food is cut up into square pieces by the head of the family by means of sharp silver tips fastened to the ends of his fingers, and then it is passed among the guests. When the dancing begins the young people simply put their hands on each other's shoulders, arranging themselves in groups of four and eight.

These scenes give a fair sample of all the information H         has attempted to give us of the condition of affairs upon this far-off world. During more than two years and a half of revelations she has nowhere shown the slightest conception of the questions which every cultivated person in our day is anxious to have answered concerning the state of this planet. No one of her Martian creations at all transcends the data that she can reasonably be supposed to have acquired by the use of her normal powers.

This applies also to the Martian language that on several occasions H         has made use of. There are in all a dozen of these texts written in a Martian alphabet. But by a careful analysis of this so-called Martian language Professor Flournoy has shown it to be only disguised French. All the letters have an exact equivalent in French and the idioms are French. It has also been thoroughly studied by Professor Victor Henry of Paris, and there is a general agreement that it is only an elaborate but childish imitation of French such as a girl brought up as H         has been and in such circumstances as she has found herself might naturally employ. The use of Ultramartian and Uranian tongues with which

she has more recently been accredited is probably to be explained in a similar manner.

It was on the 30th of January, 1894, that Hélène first announced herself as the reincarnation of Marie Antoinette, but the character did not reach its climax till nearly three years later. On November 1, 1897, this somnambulistic *rôle* maintained itself for several hours. The *rôle* seems to be most admirably adapted to Hélène's nature and ambitions. "When the royal trance is complete," says Professor Flournoy, "no one can fail to note the grace, elegance, distinction, majesty sometimes, that shine forth in Hélène's every attitude and gesture." And he dilates at length upon the charming amiability, condescending hauteur, and overpowering scorn that she successively manifests as a long line of courtiers file past. Even the way she handles her fan, her binocle, her smelling bottle, and her imaginary train is perfection itself, he says, in its ease and naturalness.

How far she personates the actual unhappy Austrian wife of Louis XVI. is less evident. The handwriting of the letters she writes in this state is decidedly different from that of Marie Antoinette, and so is the mode of expressing her thoughts. She never makes any reference to her Austrian girlhood, and never mounts the scaffold as Simandini ascends her funeral pile. Many of the scenes she enacts are properly located in the gardens or apartments of the Petit Trianon, and the furniture of her rooms is always that of Louis XVI. Often she kneels before the cradle where the little Dauphin and his sister lie asleep and sings in a low sweet voice a nursery

rhyme of her own composition having a soft plaintive melody. Then she tenderly kisses the imaginary cradle and utters a fervent prayer to the Virgin for her protection and care.

The most constant of her companions are her "dear sorcerer," the Count of Cagliostro (with whom she never tires of discussing a great variety of subjects, including the future life, the existence of God, and the details of the last royal *fête*), Louis Philippe d'Orléans (Égalité), and the Marquis de Mirabeau. The last two she identifies with two of the sitters, and if they are present and attempt to sustain their part in the *rôle* the personation will be kept up for hours.

When one of them takes the Queen out to dine she pays no attention at all to the other guests, or to the servants, eating and drinking only what her host sets before her. "And it is no sinecure," says Professor Flournoy, "to supply the wants of this august neighbour, since she possesses a truly royal appetite. The amount of food which she devours and the goblets of wine which she drinks off one after another, without suffering any inconvenience, are astounding, as in her normal state Mlle. Smith is sobriety itself and eats very little." After dinner coffee follows in the salon, and the evening is passed in varied and at times witty conversation upon the topics of the hour. Finally the Queen quietly sinks to sleep in an easy chair, waking up at the end of an hour with no recollection whatever of anything that has occurred during the evening, as hungry and thirsty as though she had eaten nothing. A glass

of water satisfies her, however, and she walks home wide-awake entirely restored to her usual powers.

Professor Flournoy explains all these remarkable changes in the personality of Hélène Smith as due to her subliminal consciousness. Hélène herself believes with all her heart in the spirit hypothesis and sincerely maintains that she has been for years under the control and guidance of discarnate powers. We do not see the necessity for either theory, and would attribute all her extraordinary states to an abnormally vivid imagination stimulated to a high degree of intensity by hypnotic suggestion and developed to its present perfection by constant exercise through a series of years.

It is well known that Hélène early manifested a strong tendency to give herself up to day-dreaming and hap-hazard plays of the fancy. She recalls many a half hour in her girlhood when she sat motionless in an easy chair seeing all sorts of strange sights, such as highly coloured landscapes, mutilated pieces of statuary, animals of extraordinary appearance and size, and other objects bearing a close resemblance to those seen in her Martian and Hindoo visions. Even when still in her teens she would wake up in the night and see her room filled with strange and unknown beings. Disinclined to play with other children, she spent her leisure hours in working out with her needle the bizarre designs of her own fertile brain.

Her father was a Hungarian who, after travelling extensively in Italy and Algiers, established himself in Geneva as a merchant. He was noted for his

facility in languages, which accounts in large measure for Hélène's remarkable attempts to speak with tongues. Her mother has always been inclined to spiritism and has had her own sporadic visions. Thus we see that by heredity and temperament Hélène was admirably fitted to become a medium, and when the suggestion came to her that she could communicate with the departed, she improved it to the full and has astonished the world with her marvellous products.

But even Myers calls the case one of "pseudo-possession." No other hypothesis so fully accounts for the divers personalities that have manifested themselves in the course of her hypnoidal life as the one that calls them the varied psychological states of Hélène herself,—phases of her own personality that absorb for the time being all her memory and thought and will.

Another alleged case of secondary personality now attracting much attention is known as the Watseka Wonder. It was originally reported in the *Religio-Philosophical Journal* for 1879 by Dr. E. W. Stevens of Janesville, Wisconsin, but recently investigated afresh by Dr. Richard Hodgson. On February 1, 1878, a girl living in Watseka, Illinois, about fourteen years of age, by the name of Lurancy Vennum, claimed to be Mary Roff, a neighbour's daughter who had been dead nearly thirteen years. Her own parents she no longer recognised, and she pined so constantly to go home "to her pa and ma and brothers" that she was sent to live with the Roffs, "where," according to the report, "she met her pa

and ma and each member of the family with the most gratifying expressions of love and affection by words and embraces . . . and she made it her home there till May 21st, three months and ten days, a happy, contented daughter and sister . . . knowing every person and everything that Mary knew when in her original body."

For some months before becoming Mary Roff she had been subject to fits or trances and was generally believed to be insane. At one time she had regarded herself as an old woman named Katrina Hogan, at another as a young man named Willie Canning. As Mary Roff she was mild, docile, and polite, and often visited Mr. and Mrs. Vennum and their children with Mrs. Roff, being introduced to them as to other strangers. The friends and neighbours of the Roff family during Mary's lifetime, it is said, she recognised and addressed by name, calling attention to "hundreds of incidents that transpired during her natural life." On the 21st of May she gradually became aware of herself as Lurancy Vennum and returned to her real parents, all the intervening period remaining a perfect blank.

Dr. Hodgson writes in regard to this case:

"I have no doubt that the incidents occurred substantially as described in the narrative by Dr. Stevens, and in my view the only interpretation of the case—besides the spiritualistic—that seems at all plausible is that which has been put forward as the alternative to the spiritualistic theory to account for the trance-communications of Mrs. Piper and similar cases, viz., secondary personality with supernormal powers. . . . My

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personal opinion is," he says, "that the Watseka Wonder case belongs in the main manifestations to the spiritistic category."

We do not see the need of either theory adequately to account for the facts, and we agree with Dr. Leaf that it should be regarded as a typical case of hysterical personation, very striking and instructive, but chiefly so for its long continuance, nearly four months.

There is no evidence from the report that Lurancy Venum as "Mary Roff" had any knowledge of the affairs of the Roff family and their friends that she could not have obtained by normal means. The report expressly says that she lived for a time "about fifty rods from the residence of the Roff family and for a much longer time in the suburbs of the same town." It also says that the actual Mary Roff had had a very unique history, being subject to fits from the age of six months, which gradually increased in violence to the time of her death. On one occasion we are told that she repeatedly "cut her arm with a knife until she fainted"; on another, after five days of raving mania, that "she recognised no one and seemed to lose all her natural senses, but when blindfolded could read and do everything as if she saw."

It is more than likely that the details of such a remarkable career would be a matter of common gossip and make a strong impression upon Lurancy, who was herself going through a similar experience. Furthermore, the Roffs were "glad to have her

come," and did everything in their power to encourage her in the idea that she was their Mary. All of Mary's sayings and doings were undoubtedly often spoken of in her hearing and the things that had belonged to Mary put to her use. It is wholly probable also that she soon overheard Mary's friends and the friends of the family talked about and so had some knowledge of them before they came to call. It is a fact that we find nothing in the record concerning any mistakes and failures on the part of Lurancy in the assumption of this *rôle*, but this will hardly surprise us when we consider the incompetency of the witnesses and the state of feeling concerning the case that prevailed at the time.

From many standpoints none of the cases of alleged secondary personality can compare with the case of Mrs. Piper. Her experiences are decidedly the most varied and complex of any that have come to our knowledge. We have already shown how they make telepathy probable—that is, telepathy with the living, not telepathy with the dead. That she has impersonated in her trances departed spirits in a most impressive way can hardly be denied, but we think they are best explained as the creations of her own abnormally vivid imagination, the material for which she has obtained partly from her sitters by telepathy and partly by the use of her normal powers.

The inner voice of Socrates showing how a pure soul almost instinctively perceives what is right and wise in great emergencies, the visions of Joan of Arc calling her to battle for her distressed country, even

such wakeful dreams as Robert Louis Stevenson's *Dr. Jekyll and Mr. Hyde*, as well as the cases described above, are only made more mysterious and perplexing by being referred to a subliminal self. At its best, the doctrine of the existence of such a self is merely an *asylum ignorantiae*, "a land of darkness," as Professor Schiller of Oxford University calls it, "where all analogies fail us and where anything may happen." To adopt it is to explain the known by the more unknown, a method of procedure that blocks the way instead of helping us on to a more rational conception of the world in which we live and to the highest development of our powers. If we are to look to our subliminal self as the fundamental revealer of truth and the source of our noblest inspirations, the less we strive to cultivate our normal powers the better for all concerned. Anything that causes us to fall into an hypnotic trance, or even a state of coma, may be the most effectual means of bringing us into accord with the true and the good. But all genuine progress hitherto has been in just the opposite direction, from sleep to wakefulness. The most intelligent people thus far have been those who were the most wide-awake, those who were in most complete possession of their normal powers. The great leaders of the race, instead of being without a conscious plan or purpose, have known far more clearly and definitely than their contemporaries what they were about. And it is not likely that the course of human experience will be reversed.

We have not needed to make use of the spirit theory to account for the facts cited in this chapter.

But if we had to choose between the hypothesis of a departed spirit and that of a subliminal self we should decide for the former. For it would be an appeal to beings having minds and motives like our own and therefore knowable, not a wholly mysterious entity of whose modes of action we can never have any direct knowledge.

It is impossible to set any limit to the mind's future development. We have little appreciation of how it came to be what it now is with all its wonderful powers, or of what it may ultimately become. Its use of the brain is as yet most rudimentary and inefficient, for in all probability a large proportion of our brain capacity still lies dormant and unemployed. Our environment is infinite and our present adjustment to it most unstable and incomplete. We have, therefore, no right to say that any of our present mental powers have reached their climax, or that entirely new faculties may not manifest themselves in the future evolution of the race.

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