

Hypnosis Redivivus. By D. HACK TUKE, F.R.C.P.

Heureux ceux qui se contentent de nier et croient que tout est dit quand ILS ont affirmé que c'est impossible.—C. RICHEL.

The renewed interest felt at the present time in hypnotism, or Braidism, induces me to return to a consideration of the subject to which I drew the attention of the readers of this Journal in 1866, in an article on "Artificial Insanity."

I do not measure the importance of hypnotism by its promise of success as a remedial agent, although in the hands of Mr. Braid remarkable benefit was derived from its employment in various forms of disease. But I think that there is more certainty of gain to Psychology and Cerebral Physiology, than to therapeutics, from pursuing in a scientific spirit the investigation of hypnotic phenomena. I should, however, be glad to see a more extended trial of the practice of hypnotism than is at present to be found in this country. At any rate, it is surely too late in the day for any one to avoid making experiments in hypnotic treatment from the fear of injury to his professional position. A medical practitioner, now dead, once assured me that, although he had frequently witnessed decided relief obtained by its use, he desisted from employing it because of the prejudice which, at that time, was excited in the minds of many against so occult an art. A weak man, it may be said, but, as my friend observed, he had to look after his bread and butter.

When the now celebrated, but then suspiciously-regarded Mr. Braid, offered to read a paper on Hypnotism before the Medical Section of the British Association at Manchester, prejudice prevailed, and his offer was declined.* But, after an interval of many years, we have witnessed the British Medical Association invite a foreign Professor to deliver an address on the subject at the Annual Meeting of 1880. Prejudice has at last disappeared, or, at least, if not entirely so, sufficiently to allow of a calm discussion of its merits. This is satisfactory, but it is hardly creditable to us that it should be necessary to ask Professor

* "I intimated my intention to the Secretaries, and (June 22, 1842) sent the paper I proposed reading for the consideration of the Committee, intimating also by letter my intention to produce before them as many of the patients as possible . . . The Committee of the Medical Section, however, were pleased to decline entertaining the subject."—BRAID.

Preyer to inform an English medical audience what their countryman had done, what he had written, and what was the meaning of Hypnotism or Neuro-hypnology. The pity was that it should be necessary, but, being necessary, one could only feel obliged to the Professor of Jena for enlightening us, and for insisting that, once again in the history of science, a prophet had not obtained his meed of honour in his own country. The whirligig of time has, however, in its revolutions, brought justice to Braid. His true position, the truth and importance of the phenomena which he so graphically described, and the caution which he exercised in avoiding sources of fallacy are now more clearly recognised, and will eventually be admitted by all candid minds.

Again, at the Salpêtrière, M. Charcot has performed numerous experiments in hypnotism, and with various appliances has induced the same psychical and physical states as those which Mr. Braid brought about so long ago.

Professor Preyer, after making a number of experiments on men and boys, found that Mr. Braid's descriptions were completely borne out, although as regards the influence on disease, he has not, so far, realised his success.

In the early part of this year also, Professor Heidenhain, of Breslau, had his attention directed to hypnotism, and studied its phenomena in a thoroughly scientific spirit. The result has been the publication of a little book which discusses the subject, and seeks to discover that which offers so intensely interesting a problem—the cerebral change which occurs when the hypnotic state is induced. His conclusions deserve the greatest consideration, and may be thus summarised:—

The cause of the phenomena of hypnotism lies in the inhibition of the activity of the ganglion-cells of the cerebral cortex—this inhibition being brought about by gentle prolonged stimulation of the sensory nerves of the face, or of the auditory or optic nerve.

This action he compares to that which is observed in the heart under certain circumstances. Thus, its ganglion-cells, which excite the activity of its motor nerves, so as to cause its rhythmic beat, may be more or less paralysed by the vagus or inhibitory nerve of the heart.

In the same way that the cardiac branches of the vagus by stimulation inhibit the motor nerve, so, it is supposed, the sensory nerves of the face or the eye, acted upon by hypnotic manipulation, inhibit the activity of the cells of the grey

matter of the hemispheres, and cause the so-called "Nervous Sleep."

Another analogous nerve-action instanced by Professor Heidenhain is the stimulation of the sensory nerve of the larynx, which causes relaxation of the muscles of respiration, and cessation of breathing; the sensory nerve inhibiting the activity of those cells of the medulla which preside over the respiratory muscles.

One more example—and that in the lower animals—is the observation of Lewisson that an india-rubber band fastened under the lower jaw of a frog, takes away from it the power of voluntary movement—the pressure on a sensory nerve inhibiting the ganglion-cells subservient to the will.

These examples appear to support the conclusions at which Professor Heidenhain has arrived, though they ought not to be too hastily adopted.

One naturally turns to the analogy, and yet the contrast of ordinary sleep.

At the discussion on Professor Preyer's paper, at Cambridge, little, if any, advance was made in determining the physiological condition in sleep on the one hand, and hypnotism on the other. The first theory which presents itself as likely is, that in the former state the change in the supply of blood to the brain through the freed action of vaso-motor nerves and the consequent suspension of the mental functions is uniform throughout the encephalon, while in the latter it is partial and circumscribed. Exhaustion is recognised as the cause of sleep, and whatever may be the means adopted to induce hypnotism, the most frequent factor is exhaustion of a particular mental faculty, or cerebral area. The psychomotor centre, exhausted by the strain on the muscles of the eye-ball, or, in the absence of this effort, the cerebral exhaustion caused by intense concentration of the attention on a subject may, according to this view, allow the unopposed action of the vaso-motor nerves in a certain vascular area, and the loss of associated psychical function, accompanied by proportionately increased activity of other hemispherical or ganglionic centres. What part the optic nerves play when staring at an object is the method adopted, is uncertain, but they must be supposed to have a share in the result. That this is not necessary, however, is shown by the fact that the eyelids may be closed and the subject be directed to squint convergently, and yet the hypnotic sleep follows.

Dr. Carpenter supports the vaso-motor theory and the

lessened supply of blood.—“The mesmeric sleep corresponds precisely in character with what is known in medicine as hysteric coma, the insensibility being as profound, while it lasts, as in the coma of narcotic poisoning or pressure on the brain; but coming on and passing off with such suddenness as to show that it is dependent upon some transient condition of the sensorium, which, with our present knowledge, we can pretty certainly assign to a reduction in the supply of blood caused by a sort of spasmodic contraction of the blood-vessels.” (“Mesmerism and Spiritualism,” 1877).

While ordinary consciousness is suspended, motility may be, and usually is, unimpaired, and one or more of the sensory centres may react acutely to external stimuli. This, of course, is true of natural somnambulism or sleep-walking.

And in ordinary sleep we witness the initial stage of somnambulism, when a dream ends in an act excited by something outside the sleeper which suggested it. Take a very simple illustration. A married gentleman, in usual health, dreamed one night that he was returning to his house with a caterpillar which he had secured during a walk. On ascending the stairs, accompanied by a dog, he placed the caterpillar upon one of the steps, when the dog attempted to disturb it. He at once stepped between them to secure the former, and used some force to push away the dog. He awoke from the encounter to find that he was pushing away, not the dog's but his wife's leg, and to hear her exclaim, “How savage!”

Here we have a dream leading to the wish to repel a creation of the imagination. This tendency arose altogether from, or was greatly increased by, the presence of a material obstacle, which in a short time excites powerful reflex action. If a child had been in the father's bed, and been the cause of this muscular excitement, the result might have been serious, and proved a case of homicidal somnambulism. This condition was not epileptic; the occurrence is clearly explicable in the way mentioned.

We will now see what reasons are advanced by Professor Heidenhain against the above, the vascular, theory of the *modus operandi* of hypnotism—one which he himself held in the first instance.

First, he points out that hypnotised persons, instead of becoming pale, become very red in the face.

Secondly, an examination of the retinal vessels has failed to indicate their contraction.

Thirdly (and this is regarded by Professor Heidenhain as

an *experimentum crucis*), when his brother inhaled amyl, and consequently had his cerebral vessels dilated, hypnotism succeeded, not only as well as, but even better than when he was not under its influence. "Hence," says Heidenhain, "it is impossible that contraction of the cerebral arteries is the cause of the hypnosis." Perhaps the congestion of the face hardly proves that there are no areas of brain in which the supply of blood is lessened, nor is the face always flushed in hypnotism. It may also be observed that the change in facial vascularity, when it does occur, is of importance in indicating that the process employed in inducing hypnotism has affected the vaso-motors in some way or other.

Secondly, the examination of the retina was confessedly difficult and hurried, but, granting that the vessels were dilated, it does not follow that we have, in this state, an index to the degree of hyperæmia of the entire brain. For, who will affirm, for example, that the acknowledged congestion of the cortex in general paralysis is reflected uniformly in a vascular condition of the retina?

Thirdly, as regards the successful induction of hypnotism, when the cerebral arteries were dilated by amyl, might not certain parts of the brain be so acted upon as to neutralize the influence of the amyl, and, if so, and there were other regions receiving a greater supply of blood, is it surprising that the phenomena of hypnotism were more strikingly developed than usual? How easily we may be mistaken in inferring the real condition of the whole from a part of the circulatory system is afforded by the two apparently irreconcilable explanations of the pain of migraine, the one attributing it to anæmia, and the other to congestion. The discrepancy is explained by Dr. Lauder Brunton, who shows that both statements are correct but incomplete, the reason being "that their authors have only observed the arteries during a part of their course, instead of tracing them backwards to the large trunks from which they sprang, and onwards to their smaller ramifications. . . . A constant vascular condition existed during the headache, notwithstanding the apparent differences in the state of the temporal artery. This constant vascular condition consisted in dilatation of the artery at its proximal, and spasmodic contraction at its distal, extremity."*

* "On Headache, Neuralgia, and other Nervous Diseases, connected with the Teeth," 1880, p 7.

These sources of fallacy are only mentioned by way of caution; and no doubt there is much evidence of general excitement of the circulation. Thus, long before Haiden-hain wrote, an increased circulatory activity during hypnosis had been demonstrated in the observations of Pau de Saint Martin, who, according to Duval, constantly observed in hypnosis a slight rise in the temperature in the axilla. Besides which the pulse always confirmed the indications of the temperature, while the sphygmographic tracings given by Pau de Saint Martin prove that during the sleep of the patient the arterial dilatation increased, along with abundant perspiration of the hands, axilla, and face, the pulse becoming more frequent, while the respiration was more hurried.*

Apart from the question of the changes in circulation, it appears reasonable to conclude, seeing that the will is in abeyance in hypnosis, that the action of the centre or centres in the cortical substance of the brain with which it is in functional relation, is suspended. Dr. Ferrier is disposed to regard the frontal lobes as exercising an inhibitory influence in normal mental life, and it may therefore be that this region is mainly dormant in Nervous Sleep. Be this, however, as it may, I cannot conceive it possible that the whole cortical substance is in the same condition of suspended action. We have evidence of ideation in various forms, although it does not act spontaneously. How can it be said that the higher centres are totally suspended when the memory of past events is intensified? Thus, a patient under M. Lasègue, in the Necker Hospital, who was hypnotised, related the smallest details of her childhood, which she did not remember when awake. The power of the subject to direct his thoughts has been taken away, but I believe that he is thinking as we think when we dream, and that the acts he performs are the outer manifestations of these thoughts, and not merely reflex motor acts, which have no concern with the hemispheres. That is to say they are ideo-motor, and illustrate the doctrine of the reflex function of the cortex, and not solely of the basal ganglia. When the frog is decapitated, automatic action is in the same way intensified, but with this

* *Art. Hypnotism*, in the "Nouveau Dict. de Médecine et de Chirurgie Pratiques," Vol. viii. Paris, 1874, p. 139. The observations of Pau de Saint Martin are from his Thesis, "Etude Clinique d'un Cas de Catalepsie Compliquée Traitée par l'Hypnotisme." Strasbourg, 1869, No. 216.

difference in the somnambule—there are not only reflex actions but there are reflex ideas. Ideas do not ever arise spontaneously in the hypnote, but, in order to exist, must always be excited from without. This is, in truth, the essential and striking characteristic of hypnotism. It is as if all that directing, controlling, originating, and regulating power, which we attribute to the *ego* were annihilated, and a power *ab extra* substituted. All impressions from within are excluded, the communication with the central authority is cut off, and the only track left open for the transmission of messages is from the outer world through the senses; and they, or some of them, are proportionately exalted. The loss of general sensibility which so often occurs, probably intensifies the susceptibility of the other senses.

Looking, as we do, to the mental act, and not to the physical strain of muscles as the most important element in the production of the phenomena, we should, in attempting to explain their *rationale*, begin with the direction of the attention by the will, carried to such a degree as to end in exhaustion and temporary paralysis of volition. Sensory excitement, through the fixed gaze of the eyes may, as already said, assist, and may act by inhibiting, reflexly, the hemispheres, or rather a limited region of them. But sensory excitement cannot operate in those cases in which merely expecting to go into the hypnotic sleep is followed by this result.

Assuming then, the temporary paralysis of so much of the higher brain-centres as involves loss of volition, the liberation of automatic action of other centres naturally follows. This conclusion, however, does not disprove the opinion that there is an accompanying change in the relative hyperæmia of different regions of the brain. The judgment formed on this point must be determined by other facts.

Whether the function of a region of the brain can be arrested without any change following in the supply of blood to it, is a question which, it would seem, is difficult to decide with certainty, great as the probability is that the amount of blood would be lessened. And yet one can conceive an alteration in the relative position of nerve-cells, or a change in the molecules which would be only mechanical or dynamic. Maury finds in somnambulism an “*exaltation de certaines fibres, au detriment de l'action des autres,*” and in hypnotism an “*affaiblissement de la force nerveuse*”—expressions which, however wanting in scientific precision, strive to catch the same idea.

Some of Ferrier's observations, though not made in reference to hypnotism, are so much to the point that I will cite them here:—"The inhibitory centres are not equally developed or educated in all, nor are they equally developed in the same individual in respect to particular tendencies to action. But this faculty of inhibition appears to me to be a fundamental element in the attentive concentration of consciousness and control of ideation." After referring to reflex ideas, he observes:—"We have the power of concentrating attention on one idea or class of ideas, and their immediate associates, to the exclusion of all others, a power differently developed in different individuals. We can thus modify and control the current of ideation, and we can also, to a certain extent, voluntarily call up and retain in consciousness particular ideas and particular associations of ideas."

It is confessed that the question on what physiological basis this psychological faculty rests is an extremely difficult one, and scarcely capable of experimental determination; but regarding the elements of attention as a combination of the activity of the motor and of the inhibitory motor centres, Ferrier regards both the voluntary excitation of ideas and the concentration of consciousness, by which the current of ideation is controlled, as essentially dependent on these centres. "During the time we are engaged in attentive ideation we suppress actual movements, but keep up in a state of greater or less tension the centres of the movement or movements with which the various sensory factors of ideation cohere. By checking the tendency to outward diffusion in actual motion we thereby increase the internal diffusion and concentrate consciousness; for the degree of consciousness is inversely proportional to the amount of external diffusion in action. In the deepest attention every movement which would diminish internal diffusion is likewise inhibited. . . . In proportion to the development of the faculty of attention are the intellectual and reflective powers manifested. This is in accordance with the anatomical development of the frontal lobes of the brain, and we have various experimental and pathological data for localising in these centres of inhibition the physiological substrata of this psychological faculty." ("The Functions of the Brain," 1876.)

There is one feature of artificial somnambulism which tends to throw light on its nature. It is greatly dependent upon habit—this it has in common with most, if not all,

neuroses. The more frequently a person is hypnotised, the more readily does he pass into that state. This might seem to favour the idea that primarily the hypnotic state is not dependent upon greater or less hyperæmia, and that the abnormal change is in the nerve cells themselves. Nervous habits of various kinds present parallel characters, and are not usually referred to changes in the circulation. It may also be remembered, as an analogous fact to the influence of habit in inducing hypnotism, that the habit of spontaneous somnambulism can sometimes be broken in a remarkable manner.

Jussieu's explanation of the cause of the sleep he witnessed in his day as magnetic—that it was due to animal warmth (in the operator)—receives confirmation in recent researches to this extent, that Heidenhain found that the passes of a warm hand over the surface of the face took effect when those of a cold hand failed. It must be remembered that this action of the hand on the fifth nerve may be explained on Braid's theory, apart from any idea of an emanation proceeding from the fingers, the facial sensory taking the place of the optic or oculo-motor nerves; indeed, it is possible that the success of an experiment Baillif tried in 1859, in the Necker Hospital, of sending a patient already naturally asleep into the sleep of hypnotism may be explained by the action on the skin in the same way.* We part company with Braid, certainly, if one of the possible ways in which the sleep, according to some observers who have, even recently, written, may be induced, is through electrical currents passing from the operator's fingers to the subject, just as much as in the theory of magnetic influence.

In making experiments upon hypnotised fowls, we have generally been struck with the influence of fear when the experiment has succeeded; the bird, like many other animals, simulating a quiet, passive condition, but instantly escaping when it supposes it is no longer watched.

A fine cock was caught, and carried in the usual way, with its head downwards, to a table, and being laid on its breast and held by its legs, the head was gently pressed on the table, while a chalk line was drawn from its beak forward

* In passing, the circumstance may be mentioned that at M. Lasègue's suggestion M. Baillif hypnotised a patient in the hospital, and then administered chloroform to see whether it destroyed the condition which had been induced. It was found that when the effects of the anæsthetic had passed away the patient was still hypnotised, and required rousing in the usual way.

several inches. After the lapse of one minute the body fell over to the side, but the head remained in much the same position. On my extending a wing, it returned to the side; the legs were not held any longer, but the bird remained passive in one position. The eyelids never closed, and frequently winked; the pupils slightly contracted when an object was brought near to the eye, but the eye did not follow it. Pinching the skin in sensitive parts elicited no sign of pain; after a while its legs trembled. Shortly after, being left to itself, got up. I then tried the experiment without the chalk line, by simply placing its beak in the same position as before. Precisely the same results followed. Afterwards the cock was laid on its back. I endeavoured to arrest its attention by holding the chalk at a little distance from its eye; same effects followed as in the previous experiments—a passive state, disregard of pinching, but the eyes wide open, and the pupils sensitive to light. I then tried to make it stand up, but in vain, and it remained for some time of its own accord on the table. It was a considerable period before it was effectually roused.

The next experiment was on a hen, but entirely failed—nothing I could do induced the hen to allow its beak to remain on the table.

With the third hen the same experiment also failed, but with a fourth considerable effect was produced, though not so decidedly as with the cock.

Thinking that carrying the fowls' heads downwards might predispose to passivity, I tried the experiment of holding them in this position for some time without any effect.

More recently I made a number of experiments of the same kind, assisted by my son, W. S. Tuke, but some careful notes which he took at the time have unfortunately been mislaid. The mode of proceeding was varied in many ways, a strong light being thrown on the eye in some instances. The general result was not so satisfactory as we could have wished, the element of *fear* almost hopelessly complicating the experiments; for I cannot agree with Preyer that his tests altogether eliminate this difficulty.

Before leaving the hypnotism of fowls, I will quote the curious statement of Father Kircher, interesting from having been written in 1646, and described in his *Ars magna lucis et umbræ*, published in Rome, under the head of “Experimentum Mirabile. De Imaginatione Gallinæ.” He says—“Place a hen, bound by its legs, anywhere on the floor; at first feeling

itself bound, it will strive to free itself from the fastenings imposed upon it in all ways—by shaking its wings, and by the motion of its whole body—but at length, this attempt being vain, composing itself to quiet, as if despairing of escape, it rests at the disposal of the victor. While the hen thus remains at rest, draw a straight line with chalk, or with any other colour you like which will represent the appearance of a cord; then shall you release it from its bonds. For a long time the hen, although thus free, is in nowise prepared to fly, although you may incite it to do so. For this there is no other reason than the powerful imagination of the animal which looks upon the line itself, drawn upon the floor, as the fastenings themselves by which it is bound. I have often exhibited this simple experiment, not without the surprise of the bystanders. I do not doubt that the same holds good of other animals—but concerning these the more curious readers may inquire.”

Other animals have, as is well known, been tried by Czermak, Preyer, &c.

I subjoin a few experiments on frogs. I was fortunate in having the help of Dr. Echeverria and Dr. Banks :—

Frog No. 1. Experiment 1.—Previously lively. Was held, head upwards, by the thumb placed on the abdomen and the fingers on the back, for five minutes. It was then placed on its back. No effect.

Experiment 2.—An india-rubber band was then placed around the jaw, as described by Lewisson. No effect, unless elastic was placed so far back as to constrict the throat.

Experiment 3.—A thread was then tied quickly round the foot, as described by one experimenter. No result.

Frog No. 2.—All experiments failed at first.

Frog No. 3. Experiment 1.—After being held in the same way as No. 1 for about five minutes it was laid on its back. It remained for some time without breathing, but the heart still beating. Lower limbs were extended, but not rigid; no reflex movements in lower limbs, but easily produced in upper extremities.

Experiment 2.—Same frog, having rested a quarter of an hour, was held in the same way for three minutes, during which the movements of the limbs became slower and slower. No reflex in lower limbs, but it was always excited in upper limbs; the latter causing frog to turn over, the lower extremities remaining perfectly passive. Frog could be lifted by forceps holding the skin of back, without moving,

but retaining exactly its position. The sound of a tuning-fork and rapping on the table had no effect in inducing movements. It could be blown along, being only slightly roused by this process. When put into cold water it made some attempts to swim, but finally became motionless and apparently lifeless, with limbs extended. Frog was then taken out of water, and after awhile became lively; but when placed with body squatting vertically and arms raised, it remained in this comic attitude for two minutes, during which it stopped breathing for twenty seconds. Eyes open.

Frog No. 1.—This frog, strong and lively, which had proved refractory in the first experiment, was now laid on its back, and gentle pressure was made with forceps on the lower jaw, so imitating Lewisson's experiment with the elastic band, a method much more easily accomplished than the other. It remained motionless five minutes, with the limbs flexed on the trunk. In this attitude of the body it was rolled rapidly over in a lateral direction, and retained the same position.

Frog No. 2, without pressure on jaw, was rolled rapidly over in the same way, and drew up its limbs in a completely flexed position, and remained quite motionless on its back for a considerable time.

In the foregoing experiments the eyes were rarely closed, sometimes half open, at others widely so.

Many causes may conspire to produce these effects, and it would be a hasty conclusion that Braidism caused or explains the condition induced. There might be fear (the cataplexy of Preyer) and the instinctive tendency many animals exhibit, when in danger, to avoid attention by simulating death, although alive to what is passing around them, and, therefore, not insensible. There might also, be pressure on the vessels, and more or less on the heart itself. Whatever the explanation, a singular condition is certainly induced, and on several occasions, when congratulating ourselves on having induced the hypnotic condition, we came to the conclusion that it was its last sleep. The next day all the frogs were lively.

Certainly one of the most striking effects of hypnotism often observed is the exaggerated reflex irritability induced by passing the hand over the muscle. I remember a gentleman witnessing for the first time the intense rigidity of the muscles in a boy, which allowed of his being placed in a

horizontal position, only supported by his head and heels on chairs, while a heavy man sat on the abdomen. It was maintained by this gentleman that the feat was accomplished by strong wires secreted in the boy's clothes, and he was only convinced of the genuineness of the phenomenon by having him stripped.

Professor Verneuil, of Paris, once made experiments on himself, and induced a state which, without being precisely the "magnetic sleep," since consciousness of the outer world remained, presented the greatest analogies to the cataleptic state, for the arm, extended horizontally, could be retained in this position 12 or 15 minutes with scarcely any fatigue (Jaccoud).

An apology might seem necessary for recording so elementary a fact of hypnotism, or of others equally commonplace about to be mentioned; but no such apology seems called for, when we find the learned Professor of Physiology at Breslau stating that when he first had his attention directed to these phenomena, within the last twelve months, he regarded them as simply nonsense.

There are many facts elicited in hypnotism which, when first witnessed, suggest another explanation than Braid's, namely, that of a magnetic force, but which when investigated are clearly referable to that loss of spontaneity and that mental slavery to the expressed or implied will of the operator, of which we have already spoken. Thus, a gentleman whom I saw subjected in private to hypnotic manipulations observed to me, after the experiment, that he had felt distinctly attracted to and repelled from the operator, and could only describe it as a gentle power drawing or repelling the body. When the operator stroked down his arm and finally fixed the end of his hand on his, he felt obliged to follow him wherever he went. The true explanation of the attraction was well shown by what the gentleman further stated, that had he looked another way he believed it would have enabled him to break off from the operator, though with some effort; but the latter took good care to impress on the subject that he must keep his eyes fixed. One experiment explicable in the same way was to make him believe that he could not speak, which succeeded. He told me he felt an influence just sufficiently strong to make it pleasanter to let his jaws remain shut than to try to open them. The same gentleman was readily made to stutter against his will. Eye-gazing was the means employed in this case, and he described the

operator's eyes as becoming luminous like a ball of fire, then annulated with fire, and then changing colours. He, however, admitted there was no influence from this beyond the steadying of his gaze so as to completely concentrate his attention.

The theory of Braid suffices to explain what occurred on another occasion, when I saw six persons, more or less known to me, thrown into the hypnotic state out of twelve operated upon. Three had been similarly influenced before. The usual experiments were performed by first making one hand revolve round the other involuntarily, stamping with the feet, nodding the head, jumping, and excessive laughter. Two young men, who only consented to be experimented upon in the interests of science, were very shortly impelled to follow the operator for a long distance, jumping the whole of the way with their hands to their sides, and their feet close together. One of these, also, was obliged to sit down in a chair, and his attention was solely fixed for several minutes on a supposed star of great brightness. When the operator said to him, "Look, the star is falling," at the same time pointing with the hand and appearing to follow its direction till it was out of sight, his expression of absorbed attention amounting to ecstasy could not fail to interest alike the physiognomist and the artist. But in a moment his features were changed, by simply addressing to him the words—"Why, you are Detective . . . ?" His answer was, "Yes." He was then informed of a murder that had been committed, and that he was going in search of the murderer. When the operator exclaimed, "There he is!" pointing to a friend of mine, he immediately seized him, and acted with a desperate determination, like a man possessed with one idea. He felt in his pockets, apparently for handcuffs, but these failing, he used his pocket handkerchief to secure the hands of his prisoner; nay, more, he carefully searched him, and took his watch, knife, and pencil, which he was easily led to believe were stolen property, and on opening the watch thought he read the name of the murderer, in consequence of its having been suggested to him. My friend then escaped, but immediately the subject chased and caught him. A struggle ensued, during which he was quickly aroused, and was astonished at the position in which he found himself. He had a dim idea of having struggled, but had not the slightest recollection of the scene that had been enacted. When shown the watch, &c., and told that he had taken them, he

was incredulous. Those who have read Professor Heidenhain's book will remember that he in some instances was able to cause the subject to recall part of the scene, just as one often remembers a dream in the course of the day from the occurrence of some circumstance associated with it.

Not less striking on the same occasion was the way in which an equally reliable subject had his attention directed, when hypnotised, to an imaginary woman ill-using a baby, and making it cry. Asked if he did not hear it, the operator pointing meanwhile to the supposed object approaching nearer and nearer, till his fingers pointed to an antimacassar by his side, and saying, "Why, look; here is the baby close by you," the subject took it up, and nursed it as carefully as possible, trying meanwhile to stop its cries. Told to feed it, he did so, first tasting the ideal food before giving any to the baby. Awaking at this moment, and asked what he had got on his knee, he replied "an antimacassar," but he had not the faintest idea how it had got there. When assured that he had taken it up for a baby, had nursed and fed it, he looked bewildered and dumbfounded. Here, again, there appeared to be complete amnesia.

In the case of a young woman, who readily passed into a state of complete susceptibility to the suggestions made to her, I examined the pupils before the experiment, and found them normal, and the pulse 88. When hypnotised, the pupils were more dilated and very insensible to light; the eyeballs were directed a little upwards, but they did not converge. The pulse rose to 100. She was pale both before and during the experiment. The contrast in the expression of the eye was marked, being bright when awake and dim when hypnotised. In Heidenhain's subjects the face was red, the pupils sensible to light. When in this state she walked around the drawing-room like an ordinary sleep-walker, but she was easily aroused by blowing on the face and being ordered to awake.

A stout, florid girl, of eighteen, in the same room, after gazing at a disc in her hand for some minutes, was completely at the mercy of any delusion which a gentleman, who was trying the experiment for almost the first time, suggested to her. There was no difficulty in making her forget her own name and believe that she had another; in inducing her to fancy her head was covered with bees, and that the room was on fire. The accompanying facial expressions were in the highest degree striking.

I have scarcely spoken of the distinction between cases of hypnotism in which there is and those in which there is not consciousness, but nothing, surely, can be more remarkable than the illustration thus afforded that consciousness in relation to the outer world is one thing and consciousness in relation to the inner world another; and that it is indifferent whether the former is present or not. It neither confers the power to act or to not act reflexly in response to commands or suggestions, and we may thus witness a man consciously performing a hundred acts he strives not to perform, and saying a hundred things he does not wish to say—a valuable practical exhibition of certain forms of uncontrollable insanity, including obsession. That there can be a consciousness in relation to the inner or ideal world is proved by those cases in which the subject remembers, when re-hypnotised, what he did and said when he was in the previous sleep. Probably this occurs in dreams without our being able to test it. In dreamland we very likely remember in the vision of to-night what we dreamt the night before, and lead two distinct lives without suspecting it.

Automatism is an essential factor of hypnotism; outer-world consciousness, and, therefore, memory, are accidents. The hypnotised cannot conceal their ideas, for these instantly express themselves in motion.

One of the most striking phenomena described by Heidenhain is *unilateral* hypnotism.

His brother was so influenced by stroking the *left* forehead and temple that after a short time immobility of the *right* arm and leg was induced. Again, with slow, repeated stroking over the skin of the left temple, a paralytic state of the extremities and facial muscles was produced. In laughing, the right cheek remained perfectly immovable, just as in paralysis of the facial nerve. The immovable parts were cataleptic, and could be moulded like wax. Further, there was ataxic aphasia, the subject in this condition not being able to pronounce or repeat words, as the co-ordinated movements of articulation could not be carried out.

On changing the manipulation to the *right* side the same phenomena appeared in the *left* side, except that there was no longer aphasia.

Manipulating *both* temporal regions caused the cataleptic condition of the limbs of each side; but the speech and facial muscles remained unaffected.

Unilateral hypnosis, caused by stroking one temporal

region in a direction from before backwards, is generally removed by the same manipulation in the opposite direction.

Measurement of the volume of the cataleptic arm showed that the amount of blood, by reason of vascular contraction, sunk enormously, while it rose simultaneously in the other arm.

It must be borne in mind that in all these experiments there was no loss of consciousness. Mr. Braid performed some of his most remarkable cures in the paradoxical condition of sleepless hypnotism.

It should be observed that these experiments did not prove to be uniform in different persons. Professor Berger accounts for it by supposing that manipulation of the *forehead* produces crossed catalepsy, while that of the *temple* produces same-sided catalepsy.

Heidenhain considers that the inability to speak depends on the fact that in the endeavour to articulate, the laryngeal muscles are spasmodically contracted. The hypnote can open his mouth and move his tongue.

In this connection, a case occurring in the service of Charcot, and reported in the "Progrès Medical," deserves mention, and great importance is attached to it, for it is considered as a "*nouveau fait à l'appui de la localisation de Broca.*"

It must be premised that, apart from any localised manipulations like those just described, there are two very different stages of hypnotism—one in which there is, and another—the cataleptic—in which there is not the power of speech. Now, it is found that it is possible to induce in the same person, at the same time, these two states; one of the hemispheres being only hypnotised, the other being cataleptic. The subject is first hypnotised in the ordinary manner; then one of the eyes is opened, the other being shut. The side of the brain corresponding—that is to say, opposite to the closed eye—is in one phase of hypnotism, that opposite to the open eye is in another phase, the cataleptic. One side of the body then presents the characters of lethargic sleep; the other those of catalepsy. Thus in the same person are seen hemi-lethargy, or relaxation of the muscles, and hemi-catalepsy.

It appears that Professor Lépine, of Lyons, was the first, in 1878, in Charcot's service, to make the following experiment, often since repeated:—

The subject being hypnotised, his eyes shut, and being in

the stage in which, on command, he will speak, write, and make gestures, the operator opens the left eye, and the right cerebral hemisphere is rendered cataleptic. Nothing is changed as to the power of speaking, writing, and gestures.

Then the left eye is closed, and the right is opened. The left hemisphere has become cataleptic, and *all communication with the outer world has ceased*. The subject replies no longer to questions. It is in vain to try to get him to write. No gestures can be excited; the face is a blank.

The same result is attained by another experiment. When hypnotised, the subject is ordered to count, and while he is counting 1, 2, 3, &c., automatically, the operator opens the left eye; but no effect is produced. The right eyelid being raised, he stops counting, and when it is closed he resumes his numeration.

Equally remarkable are the facts recorded by Heidenhain in regard to sensory changes. Sometimes the power to distinguish hot from cold by the cataleptic arm was rendered very difficult. Again, in unilateral hypnotism the accommodation spasm of the eye was found to occur only on the cataleptic side.

Professor Heidenhain reports a remarkable disturbance of the perception of colours in some hypnotised persons. His brother became completely blind in the eye of the cataleptic side. He adds that the exact investigation of Professor Cohn, carried out with the aid of modern appliances, left no room for doubt.

“The condition of the eye corresponds to that represented in Stilling’s new “Atlas,” table iv. b., l. I. 2.

“All colours appear grey in different degrees of brightness, from a dirty grey to a clear silver grey.

“As the result of manifold variation in the experiments, the following observations must be added to those of Cohn:

“Whilst objective colours produce no specific sensations, subjective sensations of colour arise when the hypnotised eye is moderately pressed and the pressure suddenly diminished.

“If the hypnotised eye be kept closed or covered with a dark curtain for some time, and then suddenly exposed, whilst at the same instant a coloured disc be held before the eye, then the latter appears for the first moment coloured, but not with the actual but with the contrast colour (therefore, *e.g.*, green when it is red); but directly after it appears grey, just as it does when the eye has not been allowed to rest.

“If one eye be treated with atropine whilst the effect of

the latter is making its appearance, the phenomena of colour blindness are changed. Yellow or blue passes from grey through the complimentary colour to the true colour, while red and green appear only as different shades of grey."

Among other conclusions drawn is this—that atropine has a direct action upon the elements concerned in the production of colour, and frees them from the change in their activity produced by hypnotism.

Professor Cohn found that a person naturally completely colour-blind, distinguished, when in the condition of unilateral hypnosis, colours which in her normal state were for her totally indistinguishable.

Returning from these extended and novel experiments to Mr. Braid, it may be said in conclusion that his principal merit consisted in demonstrating—

First—that the mesmeric sleep or coma, the muscular rigidity and catalepsy, the anæsthesia, analgesia, the hallucinations and delusions arising in the course of this abnormal sleep, are real phenomena and not feigned.

Second—that these phenomena can be induced under conditions which do not require the presence of any magnetic fluid to account for them; or, indeed, of any material influence or force passing from the operator to the person operated upon.

Third—that, on the contrary, they are the result of individual action, the concentration of the attention upon one object to the exclusion of others, assisted by straining the ocular muscles upwards and inwards.

Fourth—that suggestion plays a remarkable part in the current, of thoughts or ideas excited in the mind of the subject, either through the muscles or through words.

Fifth—that remarkably rapid changes can be induced in the circulation and innervation of the part, and by these means a mode of treatment be adopted, not magnetic, but depending upon recognised physiological principles.

Mr. Braid's son, Dr. Braid, of Burgess Hill, writing to me fifteen years ago, observed that his father's views "never changed respecting the causes of the phenomena being exoteric, although he considered hypnotism as identical with mesmerism, with this difference—that he discovered the real cause of the phenomena called mesmerism to be due to the mental concentration, &c., of the affected person himself, and not to any fluid or influence passing from the operator to the patient."

I may add that Dr. Braid himself was with him during the whole of his early experiments, and is fully persuaded of the truth and value of his father's views and practice. Up to the time of his death he was adding to the store of his experience by many valuable and interesting discoveries. His belief in the curative powers of hypnotism was undiminished, and his son proceeds to say that "on the study table lay a half finished article with the pen by its side, which he was destined never again to use. He awoke the following morning, dressed, and went to get his letters, and then complained of not feeling well. On returning to bed, and beginning to drink a hot cup of tea, he remarked that it was cold; when assured that it was very hot, he said, 'Then my sensation is imperfect.' He then turned on his side to take a little rest, but only sighed deeply, and then breathed his last."

Thus, as Dr. Braid remarks, ended the life of one of the most devoted members of a laborious profession, whose aim in life had been to pursue practice with the purest motives, the relief of suffering and the advancement of medical science.

The history of Hypnotism, or by whatever name we choose to describe the group of phenomena understood thereby, has been fitful and erratic. Paroxysms of interest rather than steady, calm investigation have marked its course. There was the era of Mesmer towards the close of the last century (1772), and the celebrated Report of the French Academy. In the midst of incredulity, Cuvier believed in the power, under certain conditions, of one person or animal exercising a magnetic influence over another. Jussieu gave in his adhesion to the genuineness of facts which the majority denied. Then, years later, was the second Report of the Academy under Husson, which made a long stride in the admission of the phenomena in dispute. In England, the arrival of a French magnetist in London and the conversion of Elliotson, marked an era which was disfigured by too hasty theorising and confusion of scientific thought on the one side, and profound ignorance on the other, ending in chaotic results. In Manchester, thanks to the excitement caused by a peripatetic lecturer, Mr. Braid, in 1841, made the series of experiments which largely led to a recognition of the truth and value of the so-called mesmeric phenomena; Sir John Forbes, Laycock, Noble, and Carpenter utilising instead of stupidly ignoring them. In 1843 also Dr. Collyer and Mr. Sutherland exhibited the so-called electro-biological experiments. In 1849, Mr. Dods, a clergyman, gave a lecture on electro-biology before the Senate of the United States.

In Edinburgh, in 1851, in consequence of the *furor* caused by the

public demonstrations of Dr. Darling and Mr. Lewis, hypnotism came to the fore, and Professor Bennett wisely accepted the facts, but endeavoured to explain them scientifically. Professor Gregory published his "Letters on Animal Magnetism." It is due to M. Piorry to add that in 1859, in a communication to the Academy of Sciences, he claimed priority for the observation of the facts known under the name of Hypnotism. "As early as 1816," he says, "I have established in the 'Journal de la Vienne' that the so-called magnetic passes act when they cause sleep by modifying the visual organs and their nerves. About 1828 I published a memoir upon ophthalmic migraine, in which I have shown that reading or the act of forcing the attention on luminous bodies during digestion, or when hunger is excessive, determines a series of nervous phenomena such as the appearance of a semi-circle of luminous and coloured light, bluish, unequal, varying in intensity, enlarging little by little at the same time that it pales for some minutes, and finally severe pains of the head and insupportable sickness are experienced. In 1828 and 1833 I gave lectures propounding a rational theory of the preceding phenomena, and of the allied symptoms of epilepsy and hysteria."

In Paris, in 1859, much interest was excited by the renewed attempt to perform operations under hypnotism. Broca made a communication to the Société de Chirurgie on hypnotic anæsthesia in connection with the attempts made in the service of Follin, arising out of the experiments of Azam, of Bourdeaux. Velpean communicated them to the Institute. A very painful operation was performed without pain.

Professor Weinhold has published an essay on Hypnotism, and Paul Börner's papers on the subject will be found translated into French in the "Journal de Médecine de Chirurgie et de Pharmacologie de Bruxelles," July, Aug. and Oct., 1880, under the title of "Du Magnétisme Animal et de l'Hypnotisme."

CLINICAL NOTES AND CASES.

Cases contributed by G. MACKENZIE BACON, M.A., M.D., Medical Supt., Cambs. Asylum.

1. *Trephining of the Skull in the case of a Lunatic nineteen months after the receipt of a Blow on the Head. Complete Recovery.*

This case has several points of interest, alike for the surgeon and the asylum physician, and may be worthy of record. It is not often that trephining is had resort to except in cases of serious external injury, and then generally at the time of the accident. In the present instance, the mental symptoms