

SLEEP AND SOMNAMBULISM.*

BY M. REGNARD.

[Translate.] From the French by the Marchioness Clara Lanza.]

II.

LADIES AND GENTLEMEN :—In the middle ages and up to the present century Somnambulists, together with epileptics and hysterical women, were classed with sorcerers and those supposed to be possessed by the devil. They were exorcised with others afflicted in similar ways and generally burned alive with great ceremony and rejoicing.

During this unenlightened era, one man of genius proved himself, in regard to Somnambulism, to be an exceptional observer and has left us a description of it which no modern neurologist would repudiate. His name, gentlemen, is upon your lips. It is Shakespeare who in his tragedy of *Macbeth* has given us a masterly description of automatism. You are all familiar, doubtless, with the sleep-walking scene, but I will recall a portion of it to your mind. After having committed her terrible crimes Lady Macbeth has attacks of Somnambulism. One of her ladies in waiting informs the court physician and both sit up at night to await the coming of the queen.

"*Gentlewoman*—Lo you, here she comes! This is her very guise; and, upon my life, fast asleep. Observe her: stand close.

Doctor.—How came she by that light?

Gentlewoman.—Why it stood by her: she has light by her continually: 'Tis her command.

Doctor.—You see her eyes are open.

Gentlewoman.—Ay, but their sense is shut.

Doctor.—What is it she does now? Look how she rubs her hands.

Gentlewoman.—It is accustomed action with her, to seem thus washing her hands; I have known her continue in this a quarter of an hour.

Lady Macbeth.—Yet here's a spot.

Doctor.—Hark! She speaks: I will set down what comes from her, to satisfy my remembrance the more strongly.

Lady Macbeth.—Out, damned spot! Out, I say!—one; two; why, then, 'tis time to do 't:—Hell is murky!—Fie, my lord, fie! A soldier and afeard! What need we fear who knows it, when none can tell our power to account?—Yet who would have thought the old man to have had so much blood in him?

Doctor.—Do you mark that.

Lady Macbeth.—The Thane of Fife had a wife; where is she now?—What, will these hands ne'er be clean? No more o' that, my lord, no more o' that; you mar all with this starting.

Doctor.—Go to, go to; you have known what you should not.

Gentlewoman.—She has spoke what she should not, I am sure of that; heaven knows what she has known.

Lady Macbeth.—Here's the smell of blood still; all the perfumes of Arabia will not sweeten this little hand. Oh! Oh! Oh!

Doctor.—What a sigh is there! The heart is sorely changed.

Gentlewoman.—I would not have such a heart in my bosom for the dignity of the whole body.

Doctor.—Well, well, well.

Gentlewoman.—Pray God it be, sir.

Doctor.—The disease is beyond my practice; yet I have known those which have walked in their sleep, who have died holily in their beds.

Lady Macbeth.—Wash your hands, put on your nightgown; look not so pale—I tell you yet again, Banquo's buried; he cannot come out of his grave.

Doctor.—Even so.

Lady Macbeth.—To bed, to bed; there's knocking at

the gate. Come, come, come, come, give me your hand; what's done, cannot be undone. To bed, to bed, to bed.

Exit.

Doctor.—Will she go now to bed?

Gentlewoman.—Directly.

Doctor.—Foul whisperings are abroad; unnatural deeds Do breed unnatural troubles. Infested minds To their deaf pillows will discharge their secrets. More needs she the divine than the physician. God, God, forgive us all! Look after her: Remove from her the means of all annoyance, And still keep eyes upon her. So good night; My mind she has mated, and amazed my sight; I think but dare not speak.

Gentlewoman.—Good night, good doctor.

Gentlemen, do you not think this fine description contains all the details I previously gave you, and that Shakespeare has shown himself scientifically superior to all who have hitherto attempted to represent this singular nervous affection?

I have now finished what I had to say about natural Somnambulism and find myself confronted by the most difficult point of my subject, provoked or induced Somnambulism—Magnetism if you insist upon my employing that detestable word.

It is quite possible by means of various practices which I shall make known to you later, to produce a nervous affection very similar to Somnambulism, but yet differing from it in several ways. The effects obtained depend of course upon the subject and the methods employed, and the conditions resulting from these may be divided into three, all of them however, being sometimes induced in a single person. These three states are:

1. Hypnotism.
2. Sleep.
3. Catalepsy.
4. Automatism.

Gentlemen, during the latter part of the foregoing century an Austrian physician of great repute, seemingly, arrived in Paris. His name was Mesmer and he had discovered the means, by a purely physical process, of producing certain effects upon the human organism which were considered to be perfectly prodigious. Mesmer appeared first about the time when great excitement was being caused by the first discoveries in electricity, made by the Abbé Nollet, and when the singular action produced upon a magnetized needle by a fluid apparently permeating the earth, attracted universal attention. Mesmer announced that he was master of another fluid which was but a modification of the terrestrial one and which operated upon the vital forces, and when properly directed could become a most important curative means.

He made an offer to the government to sell his secret which he estimated to be worth several million francs. The French ministers, however, were prudent and allowed Mesmer to keep the great mystery to himself.

His method had nothing about it resembling real magnetism. His performances took place in a partially darkened room in the middle of which was placed a large tub generally covered. A number of rods were placed crosswise on the top around which the people seated themselves. Soon the sound of a piano was heard, while the atmosphere grew heavy with perfumes. Mesmer walked about the room with a prophetic air, touching the forehead of each person, and executing a series of theatrical gestures. The subjects then fell into a comatose state. They remained in ecstasy, almost entirely deprived of sensibility and movement, and only recovered under the influence of broad daylight and fresh air.

There was not a bit of Magnetism in all this. The subjects were generally hysterical women. Their imagination was greatly excited and the same thing recurred to them as now happens to those persons we hear of as being afflicted with religious mania, etc.—they were hypnotized.

*A lecture delivered before the *Association Scientifique de France*.

To Mesmer we cannot even give the credit of invention, for hypnotism or uncompleted Somnambulism or ecstatic sleep, as you choose to call it, occupies still as it did then a high place among certain religious sects. It is nothing more than *ecstasy*, where exterior comprehension is lost and replaced by a series of visions *en rapport* with the preoccupation of the subject. I will show you presently that although ecstasy is generally of a religious character, there are many exceptions and that in fact any vivid mental emotion can provoke it.

The fakirs of India frequently induce the condition, not by absorbing themselves in some holy or poetical idea, but simply by gazing fixedly at space or some bright object or spot; some of them look at the end of their nose. The Grecian monks are also celebrated for being able to produce Hypnotism by looking steadily at a certain point or thing, and will remain insensible for hours. The result of this is that they enjoy the reputation of either holiness or witchcraft, according to the form of the delirium which usually follows.

At all times that which was called *contemplative asceticism* has been produced by fixing the gaze upon some brilliant or shining object to which was attributed some particular virtue or sacredness. These contemplations, together with violent mental excitement, were rapidly succeeded by hallucinations, apparitions, and in short, ecstasy.

Mahometanism even, although not particularly mystical, has likewise produced special forms Hypnotism. A prolonged and monotonous sound in these cases was more effectual than a fixed gaze.

Among the disciples of Hussein, the martyr, ecstasy is induced by means of tambourines beaten incessantly in a rapid and monotonous manner, accompanied by measured chanting. This ceremony frequently occurs at night, and in a short time the subjects are in a state of ecstasy, in which cutaneous insensibility is so marked that all the tortures undergone by the martyr can be likewise inflicted upon them without eliciting a cry or groan.

But these phenomena are shown in still more intense a manner in the sect of Aissaoua, many representations of which can be met with in our Algerian colony. Those who have had the rare good fortune of witnessing one of their ceremonies have been struck with the degree of anæsthesia which seems to affect these people.

The ceremony takes place at night, generally in some deserted plain. The tambourines keep up a constant monotonous sound. The subjects seat themselves about an immense fire and gradually fall into a condition of ecstasy. Some of them writhe convulsively and utter prolonged cries. Anæsthesia becomes complete and then some can be seen applying their tongues to bars of red hot iron, while others eat Barbary figs, the long thorns of which come directly through their cheeks from the inside, causing their faces to stream with blood. Still others swallow live spiders and scorpions, which remarkable feats often result very seriously.

In short, all Hypnotics proceed precisely the same way, by fixing the eyes, generally squinting, upon a certain point, or else listening attentively to a monotonous sound.

These methods which have been and always are employed to produce the phenomena, are, as we shall see, quite determined.

We are indebted to Braid for the first well regulated and experimental work upon Hypnotism, and in 1841, this English surgeon, after having witnessed so-called magnetic experiments, discovered that the prolonged fixture of the eye or hearing, and not a mysterious fluid, was the source of the incontestable phenomena he had observed. Scientific Magnetism, we may say, began with Braid.

He knew a series of experiments, for the most part extremely curious, which had just been made in France by Dupotet and Puysegur. These two men, who were imbued with Mesmer's ideas, had wondered if the tub

were really necessary, and if the magnetic fluid we all possess could not be transmitted from one person to another. They therefore procured a number of nervous persons and endeavored by a series of motions which nowadays we designate as passes, to realize some palpable effects. By this means sleep was produced much more rapidly than by Mesmer's method. Magnetism had been effected by communication, and it exists to this day, considerably augmented and enriched by all sorts of inconceivable folly.

Braid asked himself whether passes did not constitute a simple hypnotic process, and whether the contemplation of a fixed or moving point would not produce the same result as all these absurd magnetic gestures. His experiment was crowned with success, and his subject fell into the hypnotic sleep by simply looking at a metal ball. The magnetic fluid had been overturned!

The condition formed in this purely physical manner was such, and the insensibility so complete, that Braid was able to operate upon the subjects, and even amputate their limbs. His experiments were repeated in France by Broca, Verneuil and Laségne, the same results making themselves apparent.

Unfortunately, hypnotism cannot be induced with everybody. A number of unsuccessful attempts have always been observed, and then came the introduction of chloroform and ether. Braid's experiments were lost in oblivion until a courageous French *savant*, Professor Charcot, took them up, and brought them to points, which I shall proceed to demonstrate.

But first of all, let me show you some experiments in hypnotism. Animals can be hypnotized by Braid's process as well as human beings.

Here is an old experiment borrowed from Father Kircher. I take a hen and place it upon this black table in a sitting position, its head resting on the table. I then trace a chalk line from the end of its beak, upon which its eyes are instantly fixed. I remove my hands, and you see the hen remains motionless. I can pinch it and burn it, still it does not move. If I replace the chalk line by an electric light, the effect will be still more intense. This fact is equally noticeable in man, a sudden surprise can produce the same effect. I seize the chicken brusquely and place it rudely upon the table. It is motionless, hypnotized, Preyer says cataleptic, the word is, however, of no consequence. The same experiment is very successful, you also see, with a sparrow. If the bird's head be placed beneath his wing, the hypnotic sleep lasts a very long time.

A Guinea pig can be easily hypnotized. I take one of these little animals, a female, for M. Laborde has shown that the experiment is only successful with this sex, and I extend it brusquely upon its back. You see that it remains as I have placed it without moving, and that it is insensible, for I pinch it with all my strength.

Here is another one upon whose ears I hang some brilliant bits of steel. It turns its head from side to side to look at them, and now has fallen asleep so soundly that I cannot wake it. I fire a pistol so close to its ear that its moustache is singed, but it does not move.

These animals are hypnotised; their condition consists in a total loss of sensibility. But they are not asleep, they do not dream, they are not somnambulists.

Hypnotism can be produced in almost any one who makes himself perfectly passive. But if you experiment upon one of those persons whom we call hysterical you will obtain quite a different condition. The same means bring you to *artificial somnambulism*. The difference in the subject produces the difference in the effects. Here it is that M. Charcot's experiments and the Salpêtrière investigations begin, in which I was kindly permitted to assist.

I must first of all tell you what a hysterical subject is and what constitutes the principal phenomena she presents, for we shall see that her condition of Somnam-

bulism is a mere modification, sometimes a simple reproduction of them.

A hysterical woman at first sight cannot be distinguished from any other, unless we except a rather strange expression of face and a peculiarity of dress. These persons always cover themselves with several loud colors which do not harmonize in the least. I shall soon tell you the reason of this.

The first thing to be observed in them is *anæsthesia*; hysterical women are sometimes paralyzed on one side of the body and sometimes on both. They can then be pierced with long needles without feeling anything whatever, and fall into all sorts of singular errors as one side of their body seems to be dead. They do not know where their arms or legs are unless they look at them. Sometimes they allow themselves to be burned without perceiving it. One day, a hysterical patient at La Salpêtrière found a hole in the stocking she was about putting on. She sewed it up, and walked about all day. On going to bed that night she was unable to remove the stocking, and on calling for help it was discovered that she had sewed it to her foot.

A French physician, M. Bureq, has shown that the application of metal to the insensible parts render them sensible. This is called *metallo-therapy*, and singularly enough, the committee who examined this phenomenon affirmed that while sensibility returned to one arm, for example, it disappeared in the other at precisely the same point, so that the subject was in no wise benefited.

Anæsthesia of the skin also extends to the other senses. Hysterical women do not hear well, their sight is defective and, generally speaking, they are unable to distinguish colors; sometimes with one eye and often with both they are *achromatopsic*; everything looks gray to them. Their senses are therefore in a state similar to sleep, from which certain exciting influences such as metals, electricity, etc., can rouse them temporarily.

Their muscles are frequently paralyzed. There is nothing in fact, more common than a hysterical paralytic. Sometimes the muscles are violently contracted, and remain thus for years. An intense emotion can suddenly stop the paralysis in contraction. I need not tell you how this is achieved.

These contractions also, can be induced easily. It is only necessary to rudely seize the arm of a hysterical woman and it will remain contracted in whatever position you place it. In short, these people have periodical attacks in which they reproduce nearly everything that we can obtain from them by magnetism.

When a hysterical woman is about to have one of these attacks, the first thing she experiences is a certain uneasiness and discomfort, as though a ball rose from her stomach and remained stuck in her throat. This is nothing more than muscular contraction of the œsophagus. Suddenly, she utters a loud cry and falls backwards. Her eyes roll wildly and a sort of foam appears upon her lips. Simultaneously, her arms are violently extended and her clenched hands turned towards the inside. The entire body becomes as rigid as in an attack of Tetanus. Then the patient utters a prolonged scream, bends her body in the form of an arch in such a way that her weight is sustained solely upon the head and heels. This period is succeeded by all kinds of disordered movements which last from two to three minutes. Then contraction begins. Sometimes the whole body contracts, sometimes only a portion. In this way, the contraction of the arms frequently places the patient in the attitude of the crucifixion and this last generally for days accompanied by complete insensibility. Then intervenes a period of repose. One would say that it was all over and that the patient slept. But indeed it is but the beginning of the final and most interesting period of all, the ecstasy which M. Charcot has termed *attitudes passionnelles*. The patient absolutely ignorant of all her surroundings,

neither perceiving sound or light, begins to follow out a dream which has the peculiarity of being always the same and is the reproduction of some event, or series of events, belonging to her existence. My friend M. Bourneville, physician to L'Hospice de Bicêtre, and myself have published a book wherein all these facts are minutely described. It is called the *Sconographic photographique de la Salpêtrière* and comprises the entire study of hysteria as well as Somnambulism. The descriptions are completed by a series of pictures produced by an instantaneous photographic process, and these I shall now proceed to show you.

In the *attitudes passionnelles*, the hysterical patient is really a spontaneous and automatic somnambulist. You will now understand why it will be so easy presently to put her in a condition of artificial Somnambulism. I will show you some *attitudes passionnelles*. The patient sees some frightful object as you may imagine by her terrified position. But see, her features relax and here we have religious ecstasy. Once more the scene changes to give way to this when she keeps time to music which she thinks she hears.

The young girl represented in these photographs has been subject to these attacks for six years. Her hallucination or dream has never changed in a single detail, and there are a hundred more precisely like her in Paris.

Gentlemen, you will probably ask if this terrible disease, so much talked of at the present day, is new—if it is a production of this "nervous century," if I may so express myself, or whether it is of ancient date. My reply is a simple one. Hysteria is as old as humanity itself. No matter how far back you may travel in the history of the world, you will always find it. What, indeed, were the pythonesses, the ancient sibyls, the sorceresses and possessed of the middle ages, if not somnambulists and hysterical women? The descriptions of their paroxysms cannot leave us in doubt, for their characteristics are plainly shown. Do we not know that they were pricked and burned without being aware of it. And did not this very fact prove that the devil had set his stamp upon them, and did it not invariably result in their being butchered alive? Better still, painting assists us to form a vivid impression of these attacks. Look at the "possessed" which figure in the works of Rubens, Raphael, Jordaens and Breughel, and you will immediately recognize the attitudes which I have just shown you in the photographs. Here are some copies of these famous pictures. Look at them and see if you can doubt for a moment.

This long diversion I have made purposely, that you might fully comprehend the precise ground upon which we stand. The means employed to produce Hypnotism can induce hysterical manifestations similar to those produced spontaneously. These manifestations are *artificial Somnambulism, Catalepsy and Automatism*.

To provoke Somnambulism requires a very simple mode of operation. It is the same as that employed to induce Hypnotism. You can make the person fix her eyes upon a bright object. Ordinarily, however, you seat yourself directly in front of her and tell her to look at you steadily. After a minute or two has elapsed, you see her eyes assume a vague expression, then fill with tears, and finally, in a short time, varying from a minute to a quarter of an hour, according to the subject, they close, the head falls and sometimes a little foam appears upon the lips. Sleep is produced, real sleep accompanied by total loss of sensibility. This is, therefore, more than Hypnotism.

If the subject is restless, her thumbs can be held in the closed hand. As for passes, I have always observed that they retard the sleep instead of promoting it. M. Richet, on the contrary, places great faith in these movements.

You see, gentlemen, that nothing can be more simple. A little patience the first few times and the thing is done. There is no fluid, be it understood; the *magnetizer* has

nothing individually to do with the phenomenon. All that takes place originates with the *subject* whose brain is actually annihilated and brought to such a condition that any dream can be provoked by *suggestion*. We have in fact, an automaton similar to that which I called your attention to in *Natural Somnambulism*, only while the latter merely obeys the impulse of memory, the former is subject to our will.

Hypnotism can also be produced by simply placing the thumbs gently upon the closed eyelids of the subject, allowing the hands in the meanwhile to rest upon his temples and press upon the eye-balls. This process is very effectual with some subjects. A person accustomed to be hypnotized can be put into the condition by having some one shout suddenly and authoritatively in his ear, "Sleep!" A theatrical gesture accompanying the command makes it more effective. The Abbé Faria, a celebrated charlatan who completely mystified the world about twenty years ago, always adopted this method. The other ways, however, are preferred at La Salpêtrière, and also at Breslau by the well-known Professor Heidenhaim.

All that I have just said refers to the first experiments made with subjects. After they have once been hypnotized, however, the state can be induced much more easily. Here it is that Imagination steps in and mountebanks are allowed the utmost liberty of action. The mere idea that he is about to be put to sleep causes the subject to fall asleep almost immediately. If, in addition, he is made to think that the operator possesses some secret influence, or supernatural power, you will soon see what may happen.

A patient at La Salpêtrière, who had firmly persuaded herself that I had a peculiar influence upon her, fell into a hypnotic condition every time she saw me, independent of the locality. She often became hypnotized upon the staircase or in the middle of the courtyard. One day some one said to her jokingly that she could be hypnotized simply *by the will* in the midst of a public ceremony which was to take place a few hours later, and she actually refused to appear on this occasion so fully was she convinced that what had been mentioned would really occur. In such cases, the imagination is everything. The subject alone is responsible for all that happens. A few examples will make you thoroughly understand what I mean. I have actually succeeded in persuading patients that they could not leave the room because I had magnetized the door-knobs. They would hesitate for a long time before approaching them, and as soon as they touched them they became hypnotized. Need I tell you that nothing whatever had been magnetized? This experience is important, for by means of it we can explain cases in which the subjects fall into the condition while drinking a glass of *magnetized water*, or while lying down beneath a *magnetized tree*.

Magnetic experiments made at a distance belong to the same category. How often we have read of magnetizers who have succeeded in putting subjects into a deep sleep while the former is in one room and the latter in another. Here again the subject alone is the agent. I have frequently tried this experiment. A patient named P— was told, "M. Regnard is in the next room and he is magnetizing you." She would instantly exhibit great uneasiness and then fall into a deep sleep. This even happened when I was not in the next room or even in France, and when, I am free to confess, I was thinking of anything rather than her.

On another occasion I said to a patient that I would magnetize her at three o'clock in the afternoon, and ten minutes after making this remark I had forgotten all about it. On the following day, however, I learned that she had fallen asleep precisely at three o'clock.

The immense number of absurdities which go to compose magnetizer's guide books can be explained in this way. The imagination of the subject is vividly affected

and sleep is produced subjectively and without the intervention of any exterior influence. No matter what manner of *Magnetism* is employed the result is always precisely the same—the subject remains inert.

Different peculiarities are then observable, the most important of which is hyper-muscular excitability. In a normal condition our muscles are very susceptible. Any violent check causes them to contract, and the same effect is often produced by reflex action.

In artificial Somnambulism, the action of the spinal cord being no longer moderated by the brain which is annihilated, the muscles contract by reflex action beneath the very smallest influence. Pass your finger as lightly as possible over the forearm of a sleeping hysterical woman and you will immediately perceive muscular contraction. Charlatans obtain this effect by gently touching the muscles while apparently only making passes. By causing the muscles of the back to contract subjects can be made to assume positions which appear incompatible with the equilibrium. Here are a couple of photographs taken of two somnambulists. One of them, you see, has her head thrown back until it nearly touches her waist, while the other rests with her feet on the back of one chair and the nape of her neck on the other, her body bent in the form of an arch. I show you these two positions, so frequently exhibited by would-be performers of miracles, simply that I may explain to you how I obtained them.

All the results reached so easily in magnetic sleep are nothing more than hysterical muscular contraction. This can be proved by the fact that if the patient is awakened during this state, the contraction remains indefinitely, and in order to remove it she must be put to sleep again, and antagonistic muscles contracted.

The study of this important branch of the subject led M. Charcot and his students to the investigation of a most curious thing, and one which has helped to calm the fears of people, who, without witnessing the experiments performed, denounced the whole affair as an imposition.

Gentlemen, there are about two thousand persons in this room. With the exception of a few physicians who are present, it is probable that none of you know the action of the muscles as described by Duchenne, of Boulogne, nor yet the distribution of the nerves situated in the arm. Do you believe that a girl who can neither read nor write, and who comes from the most obscure portion of Brittany, could be versed in the details of this delicate physiology? For my part, I do not believe it. If she is an imposter, we shall soon discover it. Here she is; let us hypnotize her, and then excite the cubital nerve at the elbow, and see if she makes a wild gesture. Not at all; she merely bends her little finger, the third finger and thumb. The cubital nerve therefore, only affects these three fingers. Many medical students of my acquaintance are ignorant of this fact. Let us now excite the sternomastoid muscle, this diagonal cord which appears upon the neck when the head is turned. You see, she turns her head towards the opposite side. Better still, let us excite the face muscles with this pencil, and you perceive the same effects appear as were obtained by Duchenne with electricity, such complex effects, too, that even physiologists have difficulty in remembering them. If this girl is only pretending, she is exceedingly clever. I shall have finished my remarks upon sleep, after having told you that it is quite possible, at this period, to make the subject rise and follow you, and utter loud cries, should any one come between you and her.

The second state which can be produced by Hypnotism upon hysterical subjects, is Catalepsy. This *bizarre* condition, of which I shall attempt to give you an idea, exists normally in the patient, and the processes employed only serve to develop it. Sometimes it appears without any provocation whatever. Nothing is easier than to make the subject pass from a sleeping state to a cataleptic one. It is only necessary to open his eyes suddenly, and he will then remain as though transfixed. His eyes assume a

set stare, and whatever attitude you cause him to take, he will remain in indefinitely. He can be placed in the most trying postures, and he will stay just as you have put him, and as long as you choose. I have here some photographs of several people taken while they were in this state. You can see how impossible and extraordinary the postures appear, and how they can be maintained for a great length of time. I may say, however, that nothing can be easier than this kind of photography. The subjects never make the slightest movement, and it is even pretended that the celebrated sculptors of antiquity made use of cataleptics as their models. This may not be true, but it is quite possible.

There are other ways of inducing Catalepsy. Do you recollect the process generally employed to produce sleep? It was the sight of a brilliant object, or the prolonged noise of a monotonous sound. The same means are physically made use of to induce catalepsy. Let us suppose, for instance, that a hysterical subject is made to listen to the prolonged vibrations of a single octave struck upon the piano. Nothing is more irritating than this monotonous sound. The subject rapidly falls into a cataleptic state, and singularly enough, remains in it as long as the octave is struck. As soon as the sound ceases however, the catalepsy disappears.

What is thus produced by a sound can also be caused by intense light. Here are a few subjects whom I will place directly in front of this electric light. You see they become cataleptic instantly. If the light is extinguished you perceive they will fall backwards into a non-cataleptic sleep. A sudden noise or an instantaneous flash of light can produce the phenomena equally well. I remember witnessing a curious scene one day at La Salpêtrière. It was during some public ceremony, and a military band was playing in the court yard of the establishment. One of the patients under the care of M. Charcot listened to the music with the most intense delight. Suddenly there came a clash from the brass instruments which made us all tremble, but the patient fell into a cataleptic state and had to be carried from the room. A short time after another patient went during a holiday to a concert. No doubt on that occasion the musicians performed some "music of the future," for the patient suddenly fell into a cataleptic condition, and had to be removed.

It is very easy to reproduce these phenomena. It can be done by beating a Chinese gong unexpectedly in the subject's presence. You all know what a disagreeable sound it is. The patient makes a gesture of fright and remains rooted to the spot in a state of catalepsy. A sudden explosion of gunpowder is equally effective. I must tell you however, gentlemen, that this last experiment has its disadvantages. Catalepsy produced in this way often terminates with an attack of hysteria. On one occasion it was followed by a sort of frenzy which lasted five days and then stopped spontaneously.

While in a state of catalepsy the subject is not cognizant of his surroundings. He neither sees nor hears, neither does he speak, differing in this latter respect from the somnambulist or hypnotic subject. The muscles, moreover, are not hyper-excitabile. It is singular, however, that while in this condition it is exceedingly easy to provoke automatism by *suggestion*. Take for instance a cataleptic subject. Place him in an attitude expressive of anger, love, expectation or prayer. His face will immediately assume the expression required to complete the effect.

The second degree of automatism is a little more complicated, and will recall to your mind the effect obtained with somnambulists when an idea suggested to them produces others. Veritable hallucinations can be formed in this way.

To obtain this result, place yourself in front of a subject who is in a cataleptic state and endeavor to attract

his attention. This is the difficult point inasmuch as nearly all his senses are annulled. When you have succeeded, however, make a motion for example, as if you were trying to catch a bird. This gesture will immediately suggest an idea to the subject and be followed by a series of conceptions. The catalepsy ceases instantly and is succeeded by automatism. The subject rises, begins to run rapidly. His mind gradually awakens, a dream commences and generally speaking nothing is more curious than to watch its development. Sometimes he appears to be fleeing from a serpent, at others from an apparition, and so real do the hallucinations appear to him, that he would dash through a glass door or out of a window while attempting to escape from or follow his illusion. I may add that if the act suggested be quickly realized, the subject will repeat it indefinitely. If I place a cake of soap in his hands he will go through the motion of washing them interminably. One patient that I had continued for three hours and would have gone on still longer had I not stopped him.

I have shown you how you must proceed to induce the condition. Now I must tell you how to dismiss it. It is very simple. Magnetizers make passes, physicians merely tap the subject's cheek lightly with their fingers, or sprinkle a few drops of water upon the face. I must also tell you that it is not desirable or prudent to allow the state to continue for a long time. Two subjects I have seen nearly died in consequence of remaining in a cataleptic condition twenty-four hours. Respiration nearly ceased, the heart beat almost imperceptibly and asphyxia followed. Death, undoubtedly was not far off.

Gentlemen, I am done. I have told you all that I know, all that I have seen in regard to this famous *animal magnetism*. I have said nothing, however, about reading with bandaged eyes or by means of second sight, nor have I spoken of divination or the art of curing disease by magnetism. Such things have no place in Science. They are not mentioned at Sorbonne. Our asylums of Bicêtre and Charenton, or our court-rooms seem to me the only places where they may be discussed from time to time.

After all it is not, perhaps, astonishing that such *bizarres*, physiological facts as those I have just demonstrated, should have tempted charlatans and deceived imbeciles.

Before I leave you, gentlemen, let me tell you what I fear and what I wish.

I fear that while speaking to you so earnestly about sleep I have performed my best experiment. Do you recollect?—words succeeding words like the monotonous tic-tac of a clock, and only when the sound ceases does the audience awake with a start.

But away with this fatal thought, and allow me to tell you what I wish. I hope that I have succeeded in convincing you that all the astounding facts connected with Magnetism and Somnambulism are merely pathological exaggerations, diseases of sleep. That they are absolutely determined, that they can be produced when and how we choose upon particular subjects, without any magnetic fluid and without the aid of superior or supernatural forces. If I have persuaded you upon these points, I have destroyed one of the most laughable superstitions which still exist in the world, and this evening cannot be considered as thrown away as concerns either you or me. For my part, I shall always look upon it as one of the happiest and most profitable of my life.

VOLTA'S BATTERY.—To render Volta's battery constant and depolarized, Count Mocenigo fixes twelve couples with their elements on a horizontal axis, a trough of acidulated water having twelve compartments is then brought up by a lever motion so as to cover a good third of the surface of the battery, and a rotatory movement is communicated to the axis.