SLEEP AND SOMNAMBULISM.*

BY M. REGNARD.

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

I.

LADIES AND GENTLEMEN:— When the eminent *savant*, who acts as President of your society, requested me to talk to you about Somnambulism, I frankly own that I hesitated for a long time before accepting his proposition. It almost seems as if there were things in Science which we should leave undiscussed, subjects which a prudent man never takes upon himself, the task of exposing dangerous topics, in short, with which it never benefits one to meddle. Somnambulism, or animal magetism, as it is still called by persons who persist in employing an erroneous term, certainly belongs to this category.

It is a mystery, inasmuch as it is only known by its effects, and it has always struggled, from remote ages up to the present day, against two classes of people —dupes who believe all that is told them, and charlatans who seek to impose upon the world.

I made this observation over and over again to myself, scarcely desiring to class myself among either of these sets; but one thing alone decided me to address you. I knew that I should speak to an audience at once kind and enlightened, one accustomed to listen to scientific truths, and to master the facts submitted to it. I could not doubt that the rich discoveries recently made in physics had taught you to be astonished at nothing, and to renounce nothing *a priori* in the dominion of Science. You should, therefore, place yourself in precisely the same position in regard to Physiology and Medicine.

In the short space of time reserved for me, I shall consequently endeavor to the best of my ability, to teach you what intelligent men accept and profess relative to that singular nervous malady called Somnambulism.

Gentlemen, our immortal comic poet, Molière once said that opium makes us sleep because it possesses soporific properties. This phrase, although apparently a bitter criticism upon Medical Science, is in reality a definite, exact and complete expression of a scientific fact. Opium makes us sleep because it possesses soporific properties. It is impossible for us to say anything further even at the present day. For should we observe that it makes us sleep because it congests the brain, we must add also that this arises from the fact that it possesses the faculty of causing congestion. This, however, is not a solution of the problem.

These things you may say however, have nothing to do with Somnambulism, but it was necessary to make the foregoing remarks in order that you might fully understand the aim and significance of this lecture. I shall place facts before you, show you experiments and, I trust, gain your conviction. I shall prove everything to you, but explain nothing. Science is bound to substantiate facts, determine the conditions in which they occur, but it is not required also to furnish the explanation. Why does a body that we let slip from our hand fall to the ground? Why is the earth attracted by the sun? Why does oxygen unite with hydrogen? Why does one piece of iron surrounded by a galvanic current attract another? We do not know. We see that these facts exist, we can prove them, but we cannot explain.

Why then should we not treat Somnambulism in the same way? This nervous affection only seems extraordinary to us because we are not accustomed to it. It is infinitely less strange than the physical effects I mentioned to you, for it is a mere consequence of simple physiological facts which no one endeavors to authenticate. Let us remain true to our purpose, however, examine the facts and remove all the extravagant ideas which have arisen. Let us prove without attempting to explain.

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In the first place we must be in guard against fraud. It is the business of a clever and experienced man to avoid deception, and the few physicians who state that this is impossible only succeed in proclaiming the inferiority of their intelligence. If all the years of hard work they have passed through have not placed them in a position whence they are able to recognized the trickeries of mountebacks and hysterical girls, we are left to conclude that they have little profited by their education. I wish therefore, in the beginning, to make you fully comprehend that I shall only mention well attested facts, and that I shall wholly repudiate those which have not been universally witnessed, or which are so far removed from physiological truth that it has been deemed prudent to keep them still in reserve.

Somnambulism is a disease; it is a nervous affection, and one which we are able to combat, treat, and cure. It consists in the alteration of a physiological function, in a modification of sleep. We must therefore begin with sleep for it is necessary to understand the normal function before entering upon its modifications.

One of the greatest of nature's laws is that repose must succeed action. Our organs are not capable of performing their various functions indefinitely. Even the heart which apparently beats incessantly, rests a certain time between each pulsation, and instead of reposing a long while, after continued activity like the rest of the body, it relaxes for a brief space after each period of motion.

The brain is no exception to the general rule, and requires rest after having worked all day. It then ceases to act, partially at least, leaving other nerve centres, the spinal cord for instance, to govern whatever remains active among the functions of the organism.

As to what becomes of the mind, during that time, I really am unable to say. It does not enter into my course of study, and moreover, if I intended to discuss important psychological questions, I should be continually reminded that in this very chair where I enjoy the perilous honor of speaking, Jouffroy and Cousin have already given you the full benefit of their learning. I should consider it a sort of profanation to bring before you, brief perceptions, a feeble echo, so to speak, of what has already gone before me, when it is so easy for you to have recourse to the admirable rules of these illustrious teachers.

Besides, I only desire to study the purely physiological character of sleep.

A certain portion of those who have occupied themselves with the subject, affirm that sleep is our normal condition. Our birth is an awakening, our death merely a return to our primitive state, while life is simply an episode where this eternal slumber is interrupted by a series of vigils and periods of activity. Buffon was less exclusive and stated that sleep was a form of existence as real and general as any other. "All organized beings which have no sensations exist in this manner," he said.

We will not linger, however, to contemplate these broad considerations. Let us rather return to our post of observation and see what happens when a man falls asleep.

The first manifestation of this state is relaxation of the muscles. The entire body becomes, as it were, annulled; the arms fall, causing the book they supported to drop; alas! sometimes, as most of us know, the head descends abruptly forward, which causes us to wake frequently, and produces anything but an agreeable sensation. After this, the senses gradually sleep. Apparently sight is the first to become abolished. The outside world disappears, and a dream begins. Frequently, particularly in children, an astonishing spectacle is presented. When awake we should call it a kaleidoscope, or an exhibition of fireworks represented by various brilliant hued flames of all shapes, passing before us rapidly,

then suddenly fading away. Sleep is not far distant, but it is not fully established, for the sense of hearing is still awake.

This sense indeed, seems to be last to succumb. How many times, when on the point of dropping asleep, have we heard our name suddenly pronounced or a particularly interesting observation uttered; we arouse with a start exclaiming, "I was just going off, I was already in dreamland."

We might say that the sense of hearing by the very persistence of its activity contributes to the production of sleep. Does not a monotonous sound often induce the state? When amid the universal silence of Nature we hear the ceaseless lapping of waves along the sea coast, or a soft wind swaying among the trees, do we not become drowsy in listening? In infancy, an analogous mechanism, the singing of our mother or nurse, causes our senses to sleep rapidly while our ears are still sensible to the impression of sounds.

I could furnish you with innumerable examples. How many times has the monotonous discourse of a rambling and wearisome orator caused your eyelids to close involuntarily. The mind struggles at first and then abandons itself. The words succeed each other like the uniform ticking of a clock; the meaning is gradually lost upon the listener, and only when the speaker finally stops, does he awake with a start.

I have but little to say of the sleep of smell and taste. They seem to be quickly abolished and, apparently, do not even persist in dreams. A certain man who, although not a *savant*, was nevertheless a very minute and shrewd observer, Brillat-Savarin, calls our attention to the fact that it is excessively rare that we experience either the sense of smell or taste in sleep. When we dream of a beautiful garden or a field of flowers, we see the blossoms without inhaling the perfume. If we imagine ourselves to be present at a bountiful repast, we observe the dishes, and may even partake of them without tasting them.

Touch does not seem to be much behind sight in becoming abolished. But on the other hand, a slight impression in this respect is sufficient to drive sleep completely away. It is pretended, you know, that a rose leaf upon the bed was enough to prevent the Sybarites from sleeping. Recognizing the possible exaggeration, let us, however, recall some of our traveling experiences and think of the hard beds at the different hotels, which in spite of our intense fatigue kept us awake for so long.

While we become thus gradually deprived of our faculties, the organic functions continue to perform their work without ceasing; only, nothing is subject to our control, everything occurs automatically. This last word will reappear so frequently throughout this lecture that I will pause for a moment to explain to you the precise sense in which I employ it.

In ordinary life our will never sleeps. It regulates the exercise of our organs and presides over the accomplishment of all our acts. Some of these, however, are so habitual that we execute them, as we say, without thinking. Thus, for example, we expand the chest when we experience a desire to inhale the air. Sometimes we do this voluntarily, but more frequently the act is purely mechanical, and in the same way we execute a thousand different motions with the thorax in the course of an hour without being in the least aware that this is the case, without even knowing that the desire to breathe makes itself apparent. This, of course, does not mean that the causes which produce the inclination do not exist. I simply intend to say that their effect does not reach our understanding. It stops *en route* and does not go as far as the brain. It is reflected upon the spinal cord, and gives rise to what is called *reflex action.*

In a normal state, the impressions which are made upon the surface of the body are conveyed directly to the brain; the latter immediately determines the order, so to speak, in which the organs react. Suppose for instance that you burn your finger. A sensation of pain is transmitted to the brain, and instantaneously your muscles are made to contract, and you draw back your arm. It very often happens, however, that the arm is drawn back before the brain has had time to comprehend the dangerous situation of the finger. This is owing to the fact that the sensation has already made a vivid impression upon the spinal cord *en route*, and this nervous centre causes the arm to be withdrawn although the mind as yet knows nothing of what has occurred. The sensation, therefore, is reflected upon the spinal cord as though the latter were a mirror, and this is what is meant by reflex action. You see how simple it is to understand. I could go on and multiply such examples *ad infinitum*. Sneezing, swallowing and the motions of the viscera are all reflex actions governed entirely by the spinal cord.

Do you wish for proof? A single experiment will give it to you. Here is a frog whose head you see I have just cut off. It has no longer a brain and consequently no sense of any kind. It can neither feel nor exercise any will power. I now place a drop of acid upon its foot and you see that the latter is violently withdrawn. It makes frantic efforts to remove the acid. This is all due to the spinal cord which produces a series of combined reflex actions.

You are thinking, perhaps, that we are still very far away from Somnambulism. On the contrary, we are in its immediate neighborhood, for I will show you presently, that the somnambulist is a being whose brain is temporarily abolished, and who, like the decapitated frog, acts in a purely mechanical way.

To be brief, the physiological characteristic of sleep is the comotose condition of all the senses combined with voluntary movements produced by reflex action. The latter we find in dreams.

When our senses fall asleep, they convey to our understanding a final impression, which results in the last idea that we receive, and *vis-a-vis* to which, our conceptive faculty, our intelligence, is, so to speak, completely free. It then happens that this idea produces a more vivid impression, and that with the rapidity of thought it can give rise to a long chain of imaginary ideas which develop and which our still conscious mind (the perception alone being annulled) accepts as real. This chain of ideas is a dream. If the chain is well made the dream will continue methodically; if defective, we have those absurd and ridiculous dreams which sometimes, recalling the following day, cause us to smile.

In every case nothing can be more rapid than a dream. It has the precise duration required for a chain of ideas born solely of the imagination, and a dream that we often think has lasted all night, has in reality occupied the brain but a few moments. On how many occasions have you awakened several times successively after you have fallen asleep. In the few moments between each period you had a long dream, and were it not for the clock which informs you of the incontestable fact, you would swear you had been asleep for hours.

Thus, many physiologists and psychologists think that a dream is nothing more than the prolongation of ideas proceeding from a final impression produced in the mind by the senses at the moment when sleep overcomes them, or else the result of an impression formed upon the mind while it is yet awake, and the senses asleep.

The proof that this is the case is contained in the fact that in certain subjects it is possible to produce dreams and to regulate them at will. With some chlorotic young girls, for instance, the sounds produced in the arteries reach the ear and are conveyed to the brain during sleep—dreams result which are always the same. The young girl from the city will dream of a ball or concert; another, whose religious tendencies are more developed will imagine she hears the singing of angels and the hymns of saints, while a country girl will dream of

wind stealing through the foliage, of rain pattering against the window panes, the gentle murmur of a brook, or the soft twittering of birds. The senses furnish the first idea, the imagination does the rest. I told you it was possible to regulate dreams at will. With certain persons subject to nightmare, a sudden exclamation, an unusual sound can change the whole course of a dream, waken a portion of the brain, and cause the sleeper to reply to a question put to him, which proves that his dream has conformed itself to the suggestions of whoever speaks.

This, gentlemen, is the normal state. Exaggerate it, and you are in the presence of that nervous malady called Somnambulism.

Sleep, abolishing perception, but not conception; a dream that another person may modify according to suggestion; automatic action consequent upon the lethargy of a portion of the brain and the predominance of the spinal cord. This is the conception of that famous affection which appears to be so incomprehensible, when we do not take the trouble to analyze it, or else when we investigate it superficially.

You see I did not deceive you when I said it would be necessary to study sleep in order that we might comprehend the maladies arising from it.

Now, what is sleep physiologically dependent upon?

If we remove the top of a dog's skull while the animal sleeps, thus exposing the surface of the brain, we see that during this state it presents a whitish appearance, while it becomes pink as soon as the dog awakes. It has also been observed that the brain assumed this rosy hue when the dog executed a series of automatic movements, which led to the belief that he was dreaming. Sleep was therefore the result of a sudden anæmia of the brain, and a man or an animal can be put to sleep by simply pressing upon the carotid arteries in the neck; that is to say, by preventing any blood from going to his brain. These things, however, are rather problematic, and I prefer to leave them in the background, that I may give my full attention to the *diseases of sleep*.

The first important modification is the excess of sleep, what we call stupor or lethargy. These terms, I am sure, will produce very different impressions among you. Some of you will recall those terrible stories which have been told us independent of proof, in which it is said that people affected in this way have been buried alive. Others will remember the fairy tale called "The Sleeping Beauty," in which a lovely lady sleeps in an enchanted palace awaiting the arrival of Prince Charming. It is probable, however, gentlemen, that all these stories are false, although science can confirm the possibility of similar fables.

You will doubtless be intensely astonished when I tell you that the Sleeping Beauty may have actually existed. What will you say when I tell you she is alive now and in Paris! It is nevertheless true, that in one of our hospitals, of which I shall frequently speak, La Saltpêtrière, there is a woman forty-five years of age, who, to my certain knowledge, has slept for more than a year without waking. By giving you her history I will make you familiar with the principal characteristics of stupor. This woman entered the hospital in consequence of paralysis of the lower limbs. For twenty years she has been unable to move from her bed, and in that time has grown excessively stout. Her intelligence is of the most mediocre order, but her general health has always been good and her disposition exceedingly quiet. A few days prior to her strange attacks, she becomes suddenly very agitated, speaking continually with the utmost volubility and bursting into such violent fits of laughter that everyone about her involuntarily joins in the hilarity. All know the meaning of this behaviour, and the superintendent informs the physicians that the *sleeper* will soon become insensible. Her laugh gradually ceases, her eyes close, her arms fall lifeless, and in this condition she remains sometimes for a week, sometimes for a year. During this time she is nourished with a stomach pump, and no exterior excitation whatever can rouse her. From time to time she sighs heavily, and then relapses again into stupor.

The photograph that I have here will show you how closely this state resembles death externally. It shows you also just how this woman remains for months at a time pale, motionless, and in no way manifesting any sign of life, although she is far removed from death.

This is the lethargic type which after all is merely a long, profound sleep, probably filled with dreams.

Finally, the woman awakes, and is surprised to find snow and ice outside instead of the green leaves and brilliant blossoms of spring.

The second state, resulting from a modification of sleep, is Somnambulism.

This celebrated malady, gentlemen, must be divided into two parts. First we have natural Somnambulism, which arises spontaneously and develops independently, and secondly, induced or artificial Somnambulism, which results in those machinations improperly termed magnetic. This distinction, I think, is well founded, for even if the effects of the two affections are similar, their nature is quite different. You will understand this when I have made you familiar with both.

A considerable number of physicians call spontaneous Somnambulism *Automatism*, and this word seems to me infinitely preferable to the ordinary term. It admits of no confusion, to begin with, and it expresses a clear idea of the nature of the disease.

There are several degrees of Somnambulism. The most simple is a sort of intellectual sleep, the senses and organs being awake, or partially so. You recollect that in natural sleep we saw the intelligence persist, although all the muscular masses had already succumbed. Here we have the contrary in the sleep of the intelligence while the organs possess the appearance and activity of waking moments.

You know that during long night watches many women have fallen fast asleep and continued to knit or spin assiduously. All their movements were perfectly normal, but if spoken to they did not reply, for they slept. I know a little girl twelve years of age who has frequently presented the following singular fact to my notice. While walking with her father and mother along a flat, uninteresting road, during the summer evenings, it always happened that she suddenly experienced a sensation of utter fatigue, and would cease to take part in the conversation. When addressed she made no answer, for she slept as she walked. Her steps continued to regulate themselves with the others, and only when shaken lightly did she awake.

I recollect having often been told by mountain guides that in making night ascensions it is necessary to ply the whip every moment to the horses to prevent their falling asleep. One of the directors of an omnibus line in Paris said to me the other day, that the horses in the evening constantly slept while walking or trotting.

This is really Somnambulism, for the term signifies walking while asleep. Natural Somnambulism, however, is quite different, and instead of defining it accurately I will give you a certain number of incidents in which you will find it represented in all its phases.

At the time when I was employed at the *Hôpital Saint Antoine* I was fortunate enough to witness, together with Dr. Mesuet, M. Maury, and several other eminent men, one of the most curious cases of automatism that has ever been recorded.

The person was a Zouave who had received at Bazeilles, a terrible wound on his head, which left his brain partly exposed. This unfortunate man at the time of the accident fell paralyzed to the ground in a state of insensibility. But he was picked up by the enemy, carefully nursed by them, and in due course of time recovered his

senses. His paralysis even disappeared, so that by the end of two years he was able to resume his ordinary manner of living. Being a man of considerable talent and some little education, he adopted the profession of singing in the different *cafés concerts*. Just about this time he began to be affected by the singular malady, which I am going to describe to you. On certain days he would become suddenly very depressed, then as though anxious to rid himself of the melancholy, would rise, dress and walk for hours in the streets. He advanced in a straight line, looking neither to the right nor to the left, as though observing nothing about him, and indeed he could not have seen, for he ran into various persons and objects unless his hands, which he sometimes extended before him—warned him to be more careful.

He was then, as physicians now say, in the *second state*, the first condition being the normal one. Nothing in his appearance denoted Somnambulism as far as the public was concerned, except one important peculiarity. The unfortunate man was seized while in this state with a passion for stealing, which apparently nothing could overcome. Every shining object; whether valuable or absolutely worthless became the subject of his covetousness. He would take it quietly from a stall or shop window, and put it with no sign of fear or hesitation into his pocket. He also seemed to care very little whether the proprietor of the shop saw him or not, and the presence of a policeman made no difference whatever. You can readily imagine, gentlemen, that such a manner of proceding could not continue long in Paris without attracting considerable attention, and it was not long before this unhappy creature was arrested. The physician of the prison to which he was consigned, however, saw that the man was the victim of disease, and had him sent immediately to M. Mesuet, who thorougly investigated his case with the assistance of his colleagues and students.

At the hospital, the patient entered the *second state* about once a month. The attack always began in the same way, by his rising and beginning to walk. Being perfectly strange to his surroundings, he always extended his hands before him, picking up every brilliant object, watches, spoons, tumblers, etc., and placing them in the large pockets of his hospital coat. We took these things away from him without any opposition being evinced on his part. He never spoke, saw nothing, heard nothing. A ray of sunlight falling directly across his eyes did not produce the slightest effect upon them. A deafening noise made close to his ear did not cause him to swerve or tremble. His skin, even, had lost all trace of sensibility. Long steel needles were run into his flesh and the skin cauterized, without producing the slightest movement on the part of the patient.

This, gentlemen, is real Somnambulism. The mind sleeps, perception and conception are both abolished, the senses are partially annulled. Organic life exists, but the person is like the frog I showed you after I had removed its brain, that is to say, its intelligence only; as M. Charles Richet says, the brain is merely asleep. It is possible to waken it completely, it is also possible to rouse it partially, or to animate a single idea which will become the origin of a dream, just as the last idea presented to us before we sleep naturally can produce a dream which lasts all night. But the dream of a Somnambalist has particular characteristics, in as much as a certain number of functions, movement among others, are still awake.

While our man was in the second state, a large cane was placed in his hand. He felt it carefully, and his face lighted up with animation. Shouldering the cane which he evidently mistook for a gun he began to walk majestically up and down. You see an idea had been roused into activity, and this idea produced others of an associating character. The dream once begun, memory intervened and we then witnessed a most curious scene. This *ci-devant* Zouave began to walk cautiously all at once; then he stopped as if listening, walked a few steps further, listened again, then suddenly drew violently back and hid himself behind a bed. He next shouldered the cane, made a motion as though cocking a gun, seized an imaginary cartridge, went through the formula of loading and took deliberate aim at this point, his eyes glared with a fierce light and he shouted with a loud voice: "Here they come, here they come! There are at least a hundred of them!" Then, he fell suddenly back upon the floor, his hand pressed tightly to his forehead. He remained as if dead; the dream was over.

On another occasion we endeavored to provoke a different dream by *suggestion*. Being a professional singer we desired to make him think he was upon the stage. A roll of white paper was handed him, at which he looked long and seriously. Simultaneously, a lighted lamp was placed beneath his eyes with the hope that it would suggest the idea of foot-lights to him. The success was complete. The patient began to try his voice, but at the same time gave evidences of being ill at ease. He finally removed his hospital coat which was replaced by a frock coat handed to him by one of the physicians. He seized it hastily, but stopped short on seeing a small spot of bright scarlet. This was a decoration of the Legion of Honor which was attached to the buttonhole. This he carefully detached and placed in his pocket. He then dressed himself in the coat, coughed once or twice and began to sing patriotic airs of which he made a specialty.

Another time, he was given paper and ink and he began to write a letter to his old General asking some trifling favor. When he had finished, the letter was hastily removed from before his eyes, leaving nothing on the table but a blank sheet which had been underneath. He began to read over his letter, holding the blank sheet in his hand, stopping from time to time to jot down a comma or period, and finally signing his name at the bottom of the page.

The patient woke naturally, utterly astonished at finding himself in bed in broad daylight, surrounded by several people, and having no recollection of anything that had taken place.

Gentlemen, this is a typical instance of Somnambulism. You have first of all, sleeping of the brain, then an awakening either by the action of the memory, or by an exterior suggestion of a single idea which forms others. This is the characteristic of that strange condition which M. Mesuet has appropriately termed the automatism of memory.

At the close of his remarks, M. Mesuet said that automatism would undoubtedly very soon be admitted into medico-legal cases. The idea which awakens in the automaton can be anything at all. With our zouave, it was one of battle, but also frequently one of theft. I will show you others who dream of suicide, assassination, incendiary, etc., and who accomplish these crimes without having the slightest recollection afterwards of what they have done. "I do not despair," said M. Mesuet long ago, "of gaining the conviction of magistrates and causing these men to be acquitted."

This hope, gentlemen, has been realized. Three weeks ago one of these unfortunate creatures was arrested, imprisoned, tried and condemned, before he had, so to speak, come to himself. When he finally awoke, it was to find himself lost, dishonored and imprisoned. He was even ignorant of the crime which he had committed.

He then called to mind that physicians had often mentioned the strange conditions into which he sometimes passed, and he summoned M. Mesner and M. Moteb. These *savants*, while before the Court of Appeals, succeeded in putting him into the second state, convincing the lawyers thoroughly and causing the arrest of the first judges.

I have shown you an automatic robber. Here, now, is an assassin. One of the monks belonging to a con-

vent in the south of France, cherished a hatred, perhaps justifiably, against his Superior. One night he rose while sleeping, took a poinard which he had in his cell and crossing the cloister entered the Prior's room. The latter, instead of retiring at his usual hour, had seated himself to write at a table on which were two lamps. The monk passed before him without perceiving the light, walked stealthily to the bed and struck several blows with his poniard upon the pillow. He then stole out of the room, regained his cell and went to bed again. The next day when questioned by the Chapter of the convent, he could recollect nothing. This man although unconscious, would have been condemned unhesitatingly as an assassin.

A lady whom M. Mesner had long occasion to observe presented one of the most extraordinary cases of natural Somnambulism ever known.

With her, a sad and melancholy idea always was the starting point of her dream. She would rise from her bed in the night and endeavor to throw herself out of the window. She never saw the persons who surrounded her or paid any attention to them in any way. On the following day, all was a blank to her.

One night, she carefully steeped some *sous* in a glass of water, then seating herself at a table began to write to her family; "I wish to die," she wrote, "I shall never recover my health, my head is out of order. Farewell, by the time you receive this letter I shall have but little time to live. By to-morrow I shall have taken the fatal poison which this glass contains. Once more, farewell."

This done, she concealed the glass in a closet, as the poison, she thought, was not yet strong enough. Just as she accomplished this act, she was seized with a hysterical attack and awoke. On the following day she remembered nothing of what had occurred, and asked for her glass, which she said, some one had taken. Another was given her in its place. The next night, she rose from her bed while asleep, walked straight to the closet, opened it, and seized the glass of poison. During the day it had been replaced by a tumbler of pure water by a member of the family. As she removed the glass from the closet, the entire household, summoned by the lady's maid entered the room. Mme., however, did not perceive any of them. She was sleeping, dreaming. She threw herself on her knees before a crucifix and placed the glass to her lips. At this moment, as though seized with a sudden resolution, she put it aside, rose, and wrote the following letter to her family:

"Just as I was on the point of swallowing the deadly poison, an angel appeared to me just as he did to Abraham when the latter was about to sacrifice his son. He caught me by the arm, saying; "Think what you are about to do; you have a husband and children." When I heard these words my heart beat quickly and I felt overcome with conjugal and maternal love. Still, I am very ill, and my head is weak. Pardon me this fault, so great in your eyes and in mine."

This she wrote, still sleeping.

Mme. X. did many other things on various occasions just as curious, and the most wonderful thing of all was that while in her normal condition during the day, she remembered nothing she had done while asleep. She always continued any dream she may have had in previous nights, and completed it.

This leads me, gentlemen, to speak of a singular state constituted by Somnambulism. This is called *double consciousness*. The first physician to give a good description of this nervous affection was M. Azam, professor of the medical faculty at Bordeaux.

The person observed by M. Azam was named Félida X, a seamstress living in Bordeaux, whose health was moderately good, if we except the periodical attacks she was subject to.

On certain days, in the midst of her work, she would suddenly become dull and melancholy. Her head would drop upon her breast and she would sleep so soundly that it was impossible to rouse her. Finally Félida would wake in the best of spirits, Her manner was lively and she would run about in the most exalted of moods. Several hours later, all this left her. Félida relapsed once more into gloom and silence, and gradually fell again into a sound sleep. When she awoke from this sleep she remembered absolutely nothing that had taken place during the *second state*. The next time, however, that she relapsed into this condition she recollected all that occurred on a former occasion, but could recall nothing pertaining to her normal state. She was unable to recognize persons that she had then seen. Félida consequently has two personalties—two lives—in one she is sad and gloomy, in the other gay and cheerful. While in the first state she can recollect nothing of the second state, and while in the latter condition she continues her existence, so to speak, from the point she stopped at during the previous attack. This state of double consciousness, as it is termed, seems really to be merely a species of natural Somnambulism. Modern science appears to be considerably advanced upon all these points. But you will ask, gentlemen, what antiquity thought of these phenomena, and how they were received and understood throughout the middle ages and even later times. Ancient history gives us but little information on the subject, but in my next lecture I will endeavor to tell you what was known on the subject, in spite of the imprudence I shall thereby commit by attempting retrospective science from such a distance.

THE PHYSICAL BASIS OF GRAVIC FORCE AND LIGHT.

BY SAMUEL J. WALLACE.

If we suppose, that:

(1) Gravitation is the *work of some kinetic* or live *force*, because it is a first mover to do work, which we may call Gravic force; and that (2), there is an interstellar medium to convey light, called Ether, then, *is this medium capable of conveying the necessary gravic force* to produce the known acts of gravitation? And, if so, what must be the terms of its action?

To solve this, let a' be the the force of light for one square foot at the earth in one second, say 100-foot pounds; let d be the distance of the sun in its semi-diameters, say 47,000, and $a = a' d$, the force of light from one square foot of the sun in one second, say 4,700,000 ft. lbs.; let b be one pound of matter, as in the Ether; let c be the distance of fall from gravitation, to measure foot pounds in velocity, say $16\frac{1}{12}$ ft., and $2c$ be the velocity gained thereby, say 32 1-6 ft.; and let e be the velocity of light, say 950,000,000 ft., in one second.

Then, $(e \div 2c)^2 c \div a' d = y$; and, $b \div y = x$, the amount of matter which would, at the velocity of light, transmit its force from one square foot at the sun, for one second; say, 1-3,000,000,000 part of one pound.

This would be at the rate of about one grain of matter in five days from one square foot of the sun; and would produce a medium at the rate of one grain in three thousand cubic miles.

The Ether may be thousands of times so dense, depending on the distance between contacts of particles; but this weight it must have.

Then, with this effective density, *what must be the velocity* to produce the action of gravitation?

Let h be the earth's orbit, say 3,070,000,000,000 ft.; let i be one-fourth of a year, say 7,889,400 seconds, and $k = h \div 4\, i$, say 97,250 ft. velocity in one second; let l be the weight of the earth, say 13,000,000,000,000,000,000,000,000 lbs., and let m be its cross section, say 1,200,000,000,000,000 sq. ft.

Then, $(k \div 2c)^2\, c\, l\, d \div i\, m = w$; the force for one sec-