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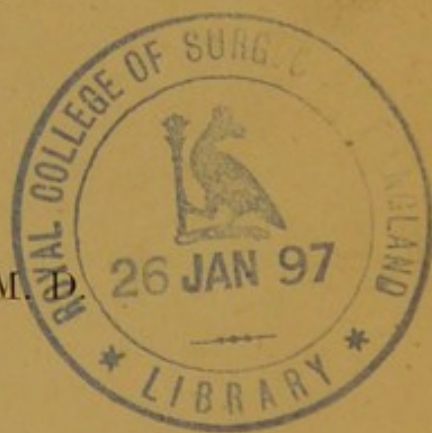
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SCIENTIFIC BASIS OF DELUSIONS

A NEW THEORY OF TRANCE, AND ITS BEARINGS
ON HUMAN TESTIMONY

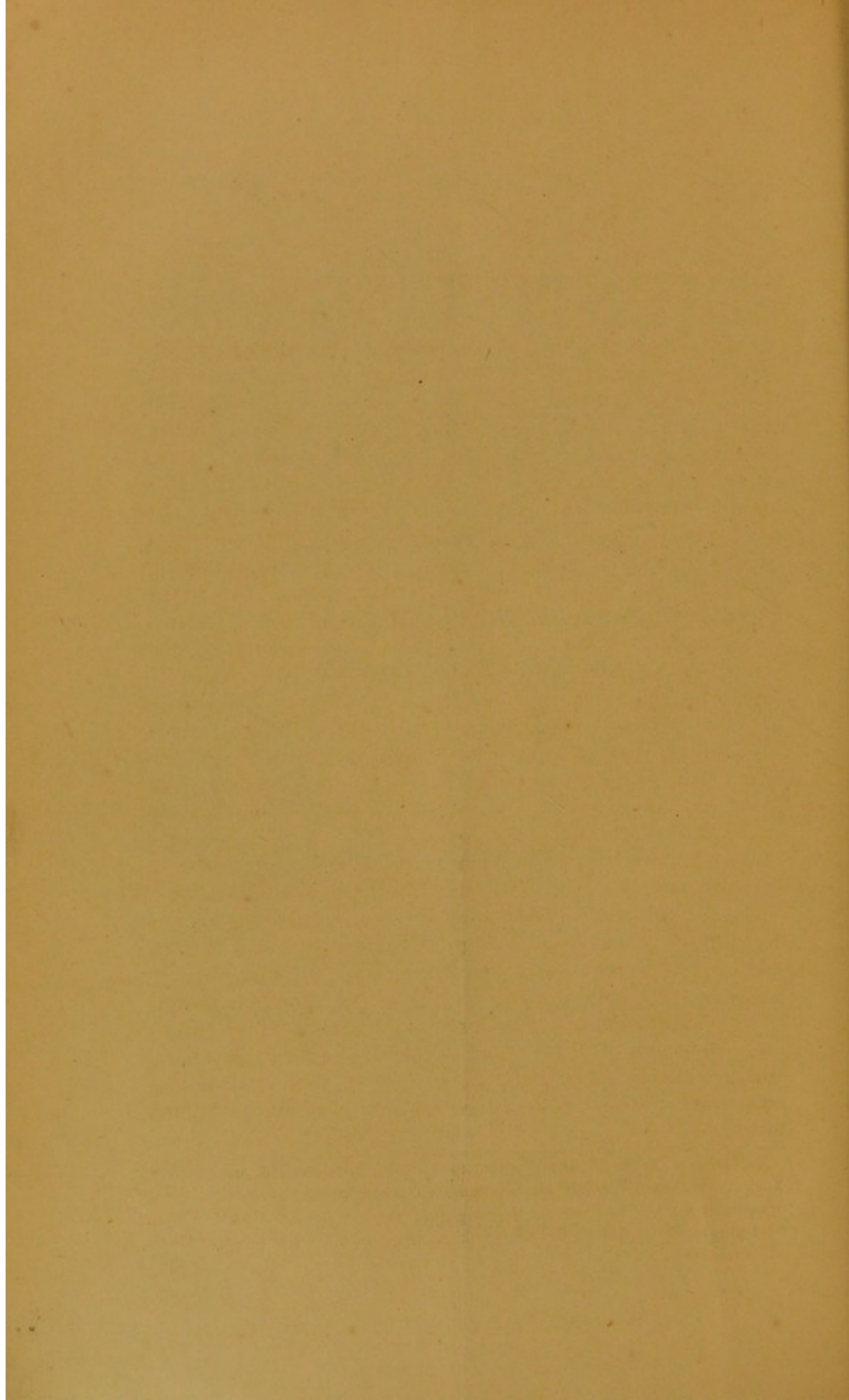
BY

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INTRODUCTION.

In the early settlement of our Western territories, it was the custom to allow any who chose to occupy the soil, to stake off a claim and to cultivate it, and to get whatever of good from it that might be possible to them; hence arose the familiar terms, squatters and squatter sovereignty. With the advance of immigration these territories have gradually passed into the hands of those who have acquired ownership of the land, and are now organized into States. Through stages somewhat analogous, all the sciences of the world have passed, or are now passing; astronomy, chemistry and physics, having already reached the organized stage, are now wholly in the possession of experts, who give their lives to the cultivation of their respective domains, while some of the younger sciences are yet in the territorial condition. Among these younger sciences is that branch of the physiology and pathology of the brain, which constitutes the scientific basis of many of our modern delusions; it is everybody's land; whoever is especially eminent for excellence in physics, in chemistry, in law or literature, in theology or business, or in any realm of human activity, save the study of the nervous system, is liable to be called upon by an inward voice, and to be required by public opinion to enter in and take summary possession.¹ The purpose of this monograph is to aid in bringing this department of cerebral physiology and pathology out of the territorial into the organized stage, by pointing out what seems to be the true and only method by which it should be cultivated.

The scientific basis of delusions consists primarily in the genuine phenomena of trance, and of the involuntary life out of which trance is developed; and, secondarily, in the relation of trance and other states and phenomena of the brain to human testimony.

¹ Within a few years, three societies—two in London, and one in New York—made up of nearly all the professions except medicine, have been organized for the purpose of investigating these subjects. What would be thought of an astronomical society composed of all classes except astronomers?

The subject of trance and allied states belongs to the neglected branch of moral pathology, which, as Mr. Lecky observes, is full of possibilities so far unrealized, but in which are undoubtedly to be made the great advances of the future, and which, in proportion as it is raised to a science, is destined to supplement and correct nearly all the great departments of human history.

The central and distinctive fact in the theory of trance here offered, is that it shifts the stand-point from which the phenomena are viewed, and shows that it is a subjective, not an objective condition, the numberless exciting causes, which have hitherto drawn almost exclusively the attention of observers, being in themselves powerless, unless acting on nature's physically or psychally predisposed, no one of them being essential to the appearance of the phenomena. The difference between the objective and subjective methods of considering trance is as radical, if, for the sake of clearness, the comparison be allowed, as the difference between the Ptolemaic and Copernican theories of the universe. By the Copernican theory—the first formal revolt against the despotism of the eye under which, from the earliest history, the human race, civilized as well as barbarous, had been willingly subjected—it was proved that not the earth as it appeared, but the sun was the center of the solar system, and since this hypothesis was refuted, not by theology alone, but by the unanimous experience of mankind, it will never cease to be a marvel that Copernicus was allowed to die a natural death. This subjective theory of trance, and in connection with it the physiological law announced in this treatise, that no human being has any qualities different in *kind* from those that belong to the species in general,¹ are in their relation to the testimony of all the senses what the Copernican theory was to the testimony of the eye, since their acceptance involves the rejection of very much that men hear and feel, as well as see, and will enable us to break away from many of the shackles that have hitherto bound the world to superstition and false reasoning.

Practically, in every-day life, we are compelled to accept the evidence of the senses, and with certain implied, and oftentimes

¹ This law is derived from all physiological observation. It is, moreover, an inevitable deduction from the theory of evolution, according to which all new qualities are the result of slow development. If any human being were found to possess a sixth sense, the evolution theory, as now understood, would be utterly overthrown.

unconscious reservations, we trust them, although they deceive us constantly, every hour and every moment, and in the simplest matters, so that our personal experiences, from birth to death, are but a series of mistakes, a chain in which nearly every link is a complete or partial blunder; but in science, the object of which is the discovery and systematization of important truth, only the specially trained reason making use, indeed, of the senses as instruments, but oftentimes rejecting their testimony—as the skillful general accepts or rejects, according to his judgment, the reports of his scouts and subordinates—is worthy of trust or capable of adding to the world's stock of knowledge.

If average human testimony is to be accepted, if the concurrent evidence of the senses of millions of honest, and intelligent, and unbiased observers is to be our guide in the pursuit of knowledge, then science is the only delusion, everything is true except the truth.

There are many, even among the staunchest opposers of delusions, who yet declare that they are open to conviction in regard to their claims, but on these and kindred subjects, want of knowledge is often confounded with impartiality. He who is willing to listen to evidence in favor of the claims of perpetual motion, of squaring the circle, of turning baser metals into gold, of mind or thought-reading, of clairvoyance or second sight, is not as he supposes, in a judicial state of mind; he is so far forth in an ignorant state of mind, since by the established principles of the sciences to which these claims respectively belong, it is proved that they must be false; and even if there were no such established principles no amount of inductive investigation could ever prove the negative of such claims.

The timeliness of this discussion of these themes will be questioned only by those who are unfamiliar with the course and necessities of recent thought. For ages, indeed, trance has been a stone of stumbling and a rock of offence to both science and superstition; a far off and unexplored land, inherited according to the traditional fancies of men, by all forms of supernatural life—a sort of *Æolian* cavern in whose dark vaults I know not how many mystic forces lie imprisoned, and liable, at the tap of any curious non-expert, to be let loose on a wondering world. The relation of trance to the special delusions of which it is the basis, is, indeed, the least important of its practical applications; it is in its bearings on the general sub-

ject of human testimony, that it particularly appeals to the attention of the thoughtful. It would, indeed, appear that the reconstruction of the principles of evidence by the aid of our present knowledge of the human brain, in health and disease, is the one transcendent need of our time. Illustrations are everywhere. A young adventurer from the West, claiming the divine gift of knowing what is in the mind of another, marches like some conqueror through the heart of the nation; science at first is dumb with wonder, or turns to superstition in his presence; the press, secular and religious, without dissent, becomes his submissive ally; high society receives the stranger to its arms; a great city falls at his feet; physicians and professors are enrolled as his body-guard; for a time he makes a college his citadel. A notorious and not over-skillful trickster crosses the sea, and at once brings literary and scientific London to its knees, from which it is yet but half risen; arraigned in court, and by accident rather than by science convicted, both continents contribute to aid his appeal. In the leading medical society of the country a prominent member reads a paper advocating the extreme claims of somnambulists, and not a word of protest is offered. Even those who most strenuously oppose these survivals, give no sound reasons for their opposition; whatever of conventional logic may chance to be cast upon the shore after these storms have passed, is usually found in the hands of superstition; the logic of the schools, indeed, is always, or almost always on the side of delusions.

Not only the great, but the very greatest minds are thus bound in the chains of human testimony. For forty years, by intervals, carefully selected committees of the French Academy struggled with mesmerism, and after a series of experiments, that fairly bristled with elements of error, left the problem unsolved; the cases of clairvoyance recorded by Swedenborg, were a puzzle even to the acute intellect of Kant; Sir William Hamilton solemnly doubts whether mind can act on matter at a distance; Bain questioned, even to his dying day, though with timidity and caution, the possibility of the existence of a magnetic fluid; George Eliot opens one of the chapters of *Daniel Deronda* with the confession that "second-sight is a flag over disputed ground;" while Emerson, one of the bravest of philosophers, declares that all these claims are mysteries of which a wise man would prefer to be ignorant.¹ These great thinkers are no better

¹ Article on Demonology, *North American Review*, March 1877.

and no worse than their text-books and instructors, since in the first universities of the world, the young are taught to believe without dispute, the testimony of their eyes and ears. The outcome of two thousand years of human reasoning, since the founding of the science of logic by Aristotle, is that the *Encyclopedia Britannica*, in its latest edition, regards it as yet an open question whether ghosts appear.¹

The antiquarian of the future, searching among the ruins of our great cities for samples of American culture in the years 1874 and '75, will find the leading organs of literary expression more or less mortgaged to mediums, and published evidence of honest and able observers, that those who have been dead and buried for centuries are, under certain conditions, raised to life, that, if the present respect for the testimony of the senses shall have survived until that day, will be absolutely convincing.

One reason, indeed, the main reason, why the controversy in regard to miracles, from Butler and Hume down to Mozley and Matthew Arnold, has been so discouraging a chapter in the history of human striving after the truth, is that there has not been on either side any just standard for estimating the worth or worthlessness of testimony on which, as must be allowed, the entire validity of the discussion depends; it has been a battle of giants, but of giants fighting in the air; both parties have been constantly beaten, and every apparent victory has been quickly followed by a renewal of the conflict. If, in their estimate of evidence both sides agree, there is nothing further to discuss; if they do not agree, further discussion is useless.²

¹ Under the article *Apparitions*.

² Since writing the above I have observed that Mr. Mozley, in the preface to the third edition of his work on *Miracles*, has admitted all I have here claimed. After stating that the *a priori* arguments against miracles are inadequate, he adds, "but after having put the speculative class of arguments against miracles aside, we go to the practical question of evidence, we find ourselves here again, before long, coming to a stand-still in controversy, because it soon appears that the two sides have no common criterion of good evidence and bad; that what is strong evidence to one man, is weak to another; what is sufficient to one is defective to another." He further remarks that the two sides are separated by a difference in "fundamental principles and assumptions."

If Mr. Mozley had reached this truth sooner, he would have probably written quite a different book, or rather he would have written none at all, since the establishment of the principles of evidence can only be accomplished by the aid of the physiology, and pathology of the brain—a department in which he is not, and does not profess to be an authority.

Recognizing these facts, the query may be put whether it would not be well for those in whom the trained capacity for philosophic thinking exists, to pause for a while amid their disputations, and to ask themselves whether their controversies thus far have not been largely a vast begging of the questions at issue; whether on the basis of our knowledge of trance, and of other facts connected with the nervous system, it is not now time to begin a rebuilding of the science of logic on which all other sciences must depend; whether much that passes for reasoning might not be saved, if we should first scientifically revise the premises of our reasoning; whether, for one example out of many, the constant collisions between science and religion might not be in a degree avoided, to the great advantage of both, if they should draw in their guns, and throw the lead, and take the sun as often as it breaks through the fog, and thus finding out where they are, be enabled to pursue, undisturbed, each one its own proper course.

The practical difficulties in the way of popularizing these views, or even of gaining a just hearing from them, have not been overlooked. So far as these facts and suggestions are true, so far must they wait for their audience; for the present, at least, it must be one man, or at most a few men, against millions of men. Nor is the advantage of those who favor established methods of reasoning that of numbers only; they have likewise the advantage of position; entrenched behind a great delusion, a child shall wield, indeed has often wielded, a more than monarch's power. He who would bring physiology to bear against the follies that centuries have made sacred, has only right and the future on his side; while around his opponents the whole brotherhood of human ignorance, educated and uneducated, instinctively rallies; he who pushes forward a popular untruth, works with the first, while he would arrest its progress, must work with the third power of the lever. The gathering superstitions of every race, reinforced by history and by tradition, all combine to swell the stream against which he must contend who would offer a true explanation of those mysteries which, under so many forms, and for so many ages, have been at once the consolation and the terror of humanity; for a delusion, it must be remembered, is as truly a possession as are houses or lands, and the science which would seek to dispel it must be at first regarded as no less than a thief and a robber.

Nothing indeed is dearer or more precious than traditional error—not only witchcraft, animal magnetism and clairvoyance, but minor and dying beliefs, as spiritualism and mind-reading, as well as the general dogma of the trustworthiness of the senses, by which the whole confederacy of untruth is bound together, have been sources of infinite comfort to many generations; no truths, in science, however important could have been for many minds half so sweet or inspiring. If, therefore, it were possible for science by its utmost effort to drive these delightful falsities at once from society, the effect would be, without doubt, pernicious if not perilous; such a sudden and powerful illumination would surely blind the eyes and shock the nerves; but it is a part of the principle of evolution that the displacement of error by truth must develop slowly, silently, almost imperceptibly, like the early coming on of the light of morning. By the time that trance and its relations to human testimony shall be generally understood, society will be ready for the change, and will cast off its delusions as worn-out garments, without a struggle or a tear.¹

The present monograph—the substance of a paper originally given before the New York Medico-Legal Society, and subsequently published in the *Journal of Nervous and Mental Diseases*—is designed as an introduction to a work on the Philosophy of Delusions, which will aim to unfold in detail the phe-

¹ In the complex economy of nature, error, as well as truth, has its mission. Truth, indeed, at first, is a luxury, while error is oftentimes an absolute necessity, although in the progress of the race, the time comes when truth itself is necessary, and error a positive hinderance. In regard to the relation of utility to truth, on all subjects where reason is the arbiter, these two propositions seem to be clearly sustained by history:

First. The fact that an opinion is generally entertained, that it has always been entertained, that it has never been doubted by any member of the human race, does not give even a presumption in favor of the truth of that opinion.

Witness the theory of the universe, that prevailed before the time of Copernicus.

Secondly. An opinion may be false, may be utterly false, may contain not even a shadow of truth, and yet it may be indispensable that for ages it should be universally believed and acted upon.

Witness the exploded beliefs of ancient Paganism.

To expect that a truth on its discovery should at once be appreciated and accepted, is to look for the leaves before the branches, for the fruit before the flower.

nomena of the Involuntary Life,¹ including Trance, and to give practical suggestions for the reconstruction of the principles of evidence in their application to history and to logic, to science and to law.

1 The phrase, Involuntary Life, which I have been in the habit of using in these discussions, includes all those phenomena of the body and mind in their mutual relations, that are independent of will, or consciousness, or of both. It is the side of physiology that has been most neglected and is least understood, both by the profession and the people; indeed, if it had been generally understood, the delusions here referred to would never have arisen. I may, perhaps, make provisional reference to my essay on this subject in the Archives of Electrology and Neurology, November, 1875, and to a paper on the Physiology of Mind Reading, in the *Popular Science Monthly*, February, 1877; also to companion monographs now in preparation, on the Automatic Action of the Brain, and on the Influence of Mind in the Causation and Cure of Disease.

A NEW THEORY OF TRANCE, AND ITS
BEARINGS ON HUMAN TESTIMONY.

By GEORGE M. BEARD, M. D.

(Read before the New York Medico-Legal Society, November 1st, 1876.)

FOR ages there have been observed a group of symptoms connected with the nervous system, which, under various confusing and contradictory names, have been at once the wonder of the masses, the refuge of delusions, the scandal of law, and the opprobrium of science. Among the more or less incorrect and meaningless terms that either superstition or science has applied to these symptoms, I may specify as especially prominent, somnambulism artificial and spontaneous, mesmerism, animal magnetism, hypnotism, Braidism, catalepsy, ecstasy, and biology.

You will agree with me—all thoughtful minds of our time do agree—that the solution of the mystery suggested by these vague and one-sided phrases, is one of the most important problems of science; since it is of interest, and of the highest moment, not for itself alone, but on account of its relations to physiology and pathology in general, to the philosophy of popular delusions of all kinds and all ages, from

the Delphic oracles to Brown's mind reading—and, what is perhaps most important of all, on account of its bearings on the principles of evidence, the estimate of human testimony which we are to consider this evening.

It is with the conviction that the problem presented by this subject can be, and is substantially solved, that these intricate and widely extending phenomena can be unified, harmonized, reduced to a science, and brought under the rule of law, that I have chosen trance as the subject of the present address.

In using the word trance to include the real phenomena represented or suggested by the above mentioned terms, I am not guilty of introducing a new term—for it is indeed a very old one—nor of wresting it from its original signification, for it has always been popularly used in the sense in which I here use it, although no one before me, so far as I know, has given it a full and formal definition.

It is necessary to understand, at the beginning, that in order to master the subject of trance, we must use deductive as well as inductive reasoning—in other words, we must reason from generals to particulars, drawing our conclusions from principles already established, as well as from particulars to generals. It is needful to insist on the validity of deductive reasoning, for without it no progress can be made in this branch of science; without it, indeed, it is a useless attempt to study subjects of this kind at all.

It was not long ago that an accomplished friend of mine, a physician, publicly remarked that it seemed to him the wiser course for scientific men to let these subjects alone, not to attempt their solution. He based his objections, perhaps unconsciously, on the fact of the impossibility of solving these problems by the inductive method.

Those who share these views may be reminded that all the sciences in their infancy, astronomy, physics, physiology, and chemistry, have been opposed on substantially the same ground; these things, it was claimed, cannot be understood by the human mind; therefore let us join ourselves to the idols of our ignorance, and let them alone. Grand as have been the results of the inductive method of investigation, as organized by Bacon, it has not displaced, and never will displace

deductive reasoning—and it is a fact of vast encouragement for the future of human knowledge, that there is now beginning to be a slow reaction in favor of a right use of the thinking, as well as of the observing faculties in scientific research. Clear evidences of this reaction are found in the writings of nearly all the leaders of scientific thought to-day. Mr. Mill, in his logic, says truly that the progress of the future must be made along the line of deductive reasoning; and, quite recently, Haeckel, in his "*History of Creation*," has protested in most vigorous language, against what I may call the tyranny of the senses. The success of the inductive method has been so brilliant that we have lost our heads; we have looked so long at one side of the subject that it has not seemed possible that it could have any other side. With the triumph of the telegraph and railway constantly before our eyes, as reminders of what the modern world owes or thinks it owes to Bacon for inductive investigation, we forget that, after all, the greatest contributions to human knowledge have been largely the product of deductive reasoning. Newton's discovery of the law of gravitation was a deduction, not an induction; and, indeed, astronomy itself is throughout a deductive science.

The Darwinian theory of natural selection, and, indeed, the whole law of evolution, of which Darwinianism is but a single factor, is simply an enormous deduction, which, so far as it becomes accepted, must be regarded as a far greater achievement than that of Newton's. Indeed, the Baconian philosophy of induction is itself a deduction.

The objection may be pressed that deductive reasoning is liable to error, and the oft-cited prediction of Lardner, that no steam vessel could ever cross the Atlantic, may be brought to mind; but all this is but to say that it is human to err, for in all methods of seeking the truth, there may be mistakes. But if any comparison were to be made between the fallacies of these two modes of reasoning, it would be found that where deduction makes one blunder, induction makes a thousand: and for this reason, if for no other, that everybody can use, and does use induction, not only in science, but in all the ordinary affairs of life, while deduction can be mastered only by a few, since it requires, in all its higher phases, a power of

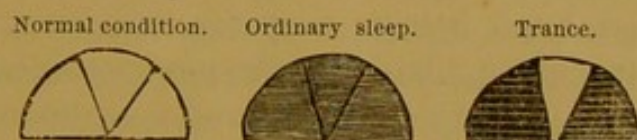
reasoning that is but rarely possessed or acquired. Difficult as it is to find those who can make correct scientific observations, it is incomparably more difficult to find those who can make just scientific deductions. On this subject Buckle remarks: "For one person who can think, there are at least a hundred persons who can observe; for an accurate observer is no doubt rare, but an accurate thinker is far rarer." Liebig, discussing the same subject, says: "Our attaching too high a value to the mere fact is often a sign of a want of ideas."

So far as the senses are concerned, they deceive all of us every hour and every moment. The delusion that the senses, any one, or all of them, can be trusted, is, with the advance of culture and the development of better notions of the principles of evidence, fast dying out. With the man whose mind is trained to right conceptions of the worth and worthlessness of human testimony, seeing is not believing, but doubting; for what is all human science but a correcting of the errors, and a supplementing of the defects of the senses. The sight is, on the whole, the best of the senses, but in civilized lands only fools trust it. The savage, casting his eyes upward, sees a blue arch filled with lights but a little way off and rolling around the world; the astronomer sitting in his study, deduces that these lights are worlds millions of miles away, and that the earth rolls around the sun. It is not the retina, but the brain behind the retina, that really sees, or, in Goethe's language, the eye sees what it brings the means of seeing. If any man wishes to blunder, let him but open his eye and believe what he thinks he sees. Indeed, the much-lauded habit of exclusively trusting the senses, and of making all knowledge a matter of induction, is not, as some believe, a result of the Baconian philosophy, but is rather a slowly passing away survival of savagery. Every barbarian is an imperfect Baconian.

The infinite errors that enter the brain through the doors of the senses, can be, in a considerable degree, guarded against, and reduced to a minimum, by the proper use of the reasoning faculties. All experts in any branch of science, or of art, consciously or unconsciously correct the defects and uncertainties, and positive errors of the senses, by the trained

intellect made especially watchful by long study and practice, in special lines of investigation. In all important and difficult matters, therefore, the only testimony that is of any value is expert testimony; if that cannot be obtained, we have no way of knowing anything of the subject.

In the special topic under consideration, the truth is only obtainable by experts and expertness. This most difficult department, in its present state of development, is only mastered after years of study, and on the basis of a thorough knowledge of the physiology of the involuntary life. The non-expert, in studying subjects of this kind, is very apt to believe what he sees and hears, or thinks he sees and hears, and concludes and reports accordingly; the expert, in the presence of the same phenomena, asks and definitely answers the question, whether the image on the retina is subjective or objective; whether he sees all or but a part of what is needful to get the exact truth; whether all things that are seen are seen in their due relations as to time, space and mass: and he also tests the results thus sifted by the established principles of deductive reasoning.



The accompanying cuts will aid somewhat in making clear the general distinction between the normal condition, ordinary sleep, and trance, as regarded by this hypothesis. The cuts are not, however, to be understood as in the light of an attempt to exactly localize any of the cerebral faculties, or to indicate the relative quantity of active and inactive regions in the trance. It is probable that in some forms of trance, nearly the entire brain is active, but enough is suspended in its activity to cause all the symptoms.

The theory of the nature of trance which I have to offer, and which I now present for the first time, is that it is a functional disease of the nervous system, in which the cerebral activity is concentrated in some limited region of the brain, with suspension of the activity of the rest of the brain, and consequent loss of volition. It is the prime requisite of a scientific

hypothesis that it should account for all the phenomena embraced under the department to which it applies. The hypothesis that trance is a morbid state, consisting in a concentration of the cerebral force in some limited region of the brain, the activity of other portions being meanwhile suspended, seems, as I hope to be able to demonstrate, to account for all the real phenomena of this state, all its different forms and stages.

Before bringing this theory to the test of accounting for all the phenomena, a few general remarks on trance seem to be necessary; and all the more since the current notions on this subject, among scientific men, and even among physiologists, are mostly crude, one-sided, and positively erroneous.

Trance, like other functional nervous diseases, may be induced either physically or psychically; that is, by influences that act on the nervous system, or on the mind; more frequently by the latter, sometimes by both combined. The special exciting causes that may induce this state are, therefore, practically infinite.

Among the physical causes are injuries of the brain, the exhaustion of protracted disease or of starvation, or of over exertion, anæsthetics, alcohol and many drugs, and certain cerebral diseases. Ordinary sleep may act as an exciting cause, as is illustrated in the somnambulistic form of trance. Under the psychical causes are included all conceivable influences whatsoever, that may powerfully excite any emotion, or group of emotions. The majority of the cases of trance come under this head.

Trance may, for the sake of convenience of description, be divided into four varieties: the *spontaneous*, the *self-induced*, the *emotional*, and the *intellectual* trance. In strictness, these varieties may, to a certain extent include each other, and in using these terms, this fact should be borne in mind. Thus, the intellectual trance is spontaneous, although the majority of the cases of spontaneous trance are not also intellectual. The self-induced trance may be partly emotional, but it is not entirely so.

A typical form of spontaneous trance is natural somnambulism, or sleep-walking; a term which is vaguely used by many

writers to include all phases of trance, excepting those which are produced by performances of mesmerizers, which are called cases of artificial somnambulism. In sleep-walking, the cerebral activity, which, during ordinary sleep is more or less lowered throughout the brain, is suddenly concentrated in some limited region; the cerebral equilibrium being spontaneously disturbed through the subjective action of dreams, the subject, under the dominion of this restricted region of the brain, the activity of the rest of the brain being suspended, runs or walks about like an automaton, with exaltation of the sense of touch often, and of the co-ordinating power, as is shown in their capacity for balancing in difficult and dangerous positions, and climbing on heights where in the normal state he would not venture. Other senses may be sealed entirely, as in other forms of trance.

Under self-induced trance are comprised those cases where the subject can bring himself into this state at will, either suddenly, or gradually. Of such subjects it may be said that they will to lose their wills; or it would be nearer the truth to say that they voluntarily put themselves under influences where the involuntary life becomes supreme.

All genuine trance preachers and speakers—and many of them are genuine—represent the self-induced variety. I have studied the case of a famous trance preacher, who tells me—and his statements are in accordance with the laws of trance, although he does not at all understand the true philosophy of his own experience—that when he began to go into this state, the first symptom was only a thrill, or electric shock through his arm, then with more practice the whole arm became convulsed, then the whole body, until in time exaltation of the faculties of imagination, and of language, were developed, and he became a most successful performer before audiences.

The current slang of spiritualistic circles in which mediums are described as “fully developed,” or “partially developed,” or as “developing,” has this basis of truth in it that it oftentimes needs practice to acquire the habit of readily, and at will, entering the trance.

There is such a thing as the habit of being entranced. After one has been a number of times thrown into this state

by any procedure or influence—whatever it may be—he seems to grow more and more susceptible to the influence of that special procedure or influence, and will be entranced by it quite likely, while many other equally good or better methods fail.

Some have a habit of falling into trance spontaneously at regular intervals; there is indeed, in this disease, the same periodicity oftentimes that has long been observed in neuralgia. Somnambulism, or sleep-walking, is a form of trance that may become periodic.

One of the most noted writers on spiritualism has been accustomed to induce the trance by starving himself, or, at least, by living very low. This is a good method, but it is slow and painful, and may be harmful; for the brain, through want of just nutrition, gets into a chronic pathological state, when its equilibrium is readily upset—in nautical language it is thrown off the center, the imagination becomes abnormally active, and the subject is oftentimes borne to heaven, where he sees and hears many wonderful and beautiful things, and reports accordingly. The visions of Swedenborg, and of Mahomet, possibly—for it is difficult to obtain any detailed information in regard to the heroes of distant ages that will bear scientific scrutiny—as well as the ecstasies of many of the mediæval saints and recluses, and the bright experiences of the dying everywhere, find here their pathological explanation.

Under emotional trance are included cases that are caused by the so-called mesmeric performances, or through the feelings of fear, wonder, reverence and expectation, however excited. The majority of the cases of trance come under this head; for every one is endowed with these emotions, and in the greater part of the human race they are the controlling elements in character—they are especially active and irritable in the young, and in those who have passed out of childhood, and have not yet reached full manhood, or womanhood; they are present, however, in force at all ages, (for in this respect all men are women and all women are children), and in the strongest and most intellectual minds they are apt to be in constant and usually successful rebellion against the authority of reason—any influences, therefore, that excite any, or all, of these emotions, may be regarded as exciting causes of trance.

The emotions through which trance is most likely to be excited, are fear, reverence, wonder, and expectation. Among the numberless conditions or circumstances that are liable to excite these emotions, it is needful to specify but a few that are of a representative character, are most familiar and most readily verified, such as standing on a height, or on the track as a train is approaching, or a sudden alarm of fire in a crowded building; the imposing impression made by a pretense of supernatural power, as when it is claimed that the dead are raised, or that departed spirits are communicating with their friends, or that the sick are instantly healed, and similar miracles; and, lastly, and of least importance, the performances of so-called mesmerizers or hypnotizers, as passes to and fro, manipulations, concentrating the attention on some fixed point or bright object, as a button or nail in the wall, drinking of water believed to be magnetized, and so forth.

The one fact common to all these conditions is, that they exert some one or several emotions—fear, or wonder, or expectation—to such a degree that the activity of the rest of the brain is suspended while these emotions are abnormally active, and consequently the will loses control, and the subject acts automatically in response to external or internal suggestion, doing the very things he wishes to avoid doing, and unable to do what he most desires. If on the edge of a height, he becomes dizzy, and may fall; if fearful of being crushed by the approaching train, he cannot move a step; if seated in a *séance* with supposed mediums, he sees and hears whatever he is told to see and hear, as flames, or light, or sound, and recognizes the faces of departed dear ones in a rubber mask, a pocket-handkerchief, or in a drop of water.

The almost universally held belief that the mesmeric form of emotional trance is caused by some force or fluid (animal magnetism) passing from the body of the operator into the body of the subject, is as far from the truth as any view on any subject possibly can be; and the fact that this view is held not by the masses alone, but probably by ninety-nine out of a hundred physicians and scientists, shows how one-sidedly this whole subject of trance has been studied.

In producing this form of trance, indeed, the presence of

the operator or magnetizer, so-called, is not needed at all; any influence or circumstance that the subject expects will put him into the trance is liable to produce that effect, particularly if, as is usually the case, the emotions of wonder and fear are at the same time acted upon. Subjects in the mesmeric trance are under the control of the external suggestions of the operator, as expressed by voice or manner (not of his silent, unexpressed will, as some imagine), because they go into the state with that expectation; otherwise the operator has no power over him. But there is no need of any operator at all. Not much less erroneous and one-sided is the conclusion of Braid, who, in some respects, has studied the subject with intelligence, that fatigue of the eyes and power of attention by looking upward intently at some bright object—as a key or pencil—is specially important.* The fact is that it makes no difference as such what you do to produce mesmeric trance; it makes no difference who does it; it is a *subjective* matter entirely, and all depends upon the emotions of the subject, what he fears, expects, or wonders at. True enough that a professor of vast fame succeeds in a greater proportion of cases, but that is because the subject expects great things of him, and all the needful emotions are created in his presence. The operator may be an absolute ninny; but if the subject believes in him, that is enough. He may make the passes up or down, or crossways, with his fingers, or with his hands, or he may make no passes at all; he may sit perfectly still; his presence is not necessary; he may be a thousand miles away; he may have been dead or buried a thousand years; he may never have existed: if the subject strongly believes that he exists, or that he is raised to life, and expects or fears that he may have the power to put him into a trance, entranced he will become. Let any one with some reputation as a mesmerizer request the audience to stand up, stating also that in a few moments they will be mesmerized,

*These attempts to induce trance with keys, pencils, and so forth, will fail almost always even with persons psychically and physically predisposed to go into that state, if the subject does not know or suspect that something of the kind is to happen. I have proved this repeatedly by a thorough series of experiments with the patients of Demilt Dispensary.

and in ten minutes let him permit those who can to sit down, and it will be found that perhaps one out of ten cannot sit down; they are thoroughly entranced, fixed to the floor, and are ready to do whatever they are told to do. If the statue of the mesmerizer had been on the platform instead of the mesmerizer himself, and if it could have spoken, and the audience could have believed in it, the results would have been just the same. One famous operator used to simply say to his subjects, "Sleep," and they passed into the trance.

In one of the most successful experiments of this kind that I ever witnessed, a number of individuals were seated side by side on a platform before an audience, and were simply directed to put one hand on the wrist of the other, close their eyes, and control their thoughts. In fifteen minutes at least one-third of those who tried the experiment were entranced.

To intellectual trance belong the extreme cases of what are commonly characterized as absent-mindedness; a state which is quite distinct from simple mental attention. The popular term absent-minded, as applied to those who become so absorbed in thought that they are unconscious of what is going on around them, and perhaps respond automatically to external suggestions or influences, is, in view of the theory of trance here advocated, a happy one; since it expresses, with partial correctness, the real state of the brain during an attack of that kind. A large portion of the brain is active, and, until aroused, is insensible to surroundings, and thus responds mechanically. The biographies of illustrious thinkers are filled with instances, some of which are probably correct, of this form of trance. Thus Walter Bagehot says of Adam Smith, the great political economist, that his absence of mind was amazing. On one occasion, having to sign his name to an official document, he produced, not his own signature, but an elaborate imitation of the signature of the person who signed before him; on another occasion, a sentinel on duty having saluted him in military fashion, he astounded and offended the man by acknowledging it with a copy of the same gestures.

In these intellectual trances, great thoughts have been, without doubt, evolved, that would have been impossible to the brain in its normal state.

The hypothesis I have here presented must, if true, account for the actual phenomena of trance in all its forms and stages, however induced. If there be a single fact of trance that is positively inconsistent with this hypothesis, then the hypothesis has no value. It can be shown that by this hypothesis all the facts of all forms and phases of trance are explained, unified and made harmonious; nay, more, that only by this hypothesis, is it possible to give any unity or solidarity to the phenomena of this state.

FIRST. This hypothesis accounts for the loss of the control of the will and the automatism of trance, which is the first observed, and most distinguishing feature.

In his normal state man is, to say the least, nine-tenths a machine. As I have elsewhere said, the involuntary life—that which acts without the will, or in spite of the will—is the chief fact in human life, and in human history. It is the side of humanity that in some most important relations has been least studied, and in which are to be made very largely the physiological discoveries, and the advances of the future.

Comparing life to a wheel, as Dr. S. S. Laws has done, the voluntary functions may represent the narrow hub, while the involuntary functions are represented by all the area between the hub and the periphery. In this little inner circle lies all human responsibility and all the vast influence of punishment or reward; in all the rest of his functions, man is as much an automaton as a tree or a flower. Now, in the trance, this little inner circle, of what we call volition, is encroached upon by the involuntary life, and in the deeper stages is entirely displaced by it. The fully entranced person has no will; what he wishes to do he cannot do; what he wishes not to do he does; he is at the mercy of any external or internal suggestions. Every one who has had the nightmare knows what this feeling of powerlessness is, for the more he tries to run the firmer he sticks. A mesmerized subject, when he tries to do anything against the command of the operator, does just the opposite.

This hypothesis of the concentration of the cerebral activity in a limited region, accounts for the displacement of the will in this way. The will may be defined as the co-ordinated

activity of all the faculties of the mind, including, in general terms, the perception, the emotions and the intellect. Cerebro-physiologists will agree—all questions of phrenology, or cranioscopy, or minute specializations of functions aside—that the brain does not act as a unit, but that different parts are the organs of different faculties. When the cerebral activity is harmoniously diffused, as in the normal state, through all the different regions, the man is said to be under the control of the will. When the cerebral activity is concentrated in some limited region of the brain—say that devoted to the emotions, or that devoted to the intellect, the activity of the rest of the brain being suspended for the time—the man would have no will; he would be under the control of that group of faculties; he would be a conscious living automaton, as a fully-entranced person always is.

SECONDLY. This hypothesis explains why trance is an abnormal state. It shows that it must be a morbid pathological condition, and also shows in what this morbidness consists. The man whose mental faculties are mostly suspended, who has no will, but is under the control of some single faculty, is surely in an abnormal state, and in this respect the popular idea is correct. It is a functional disturbance relating only to circulation and innervation, and not causing structural changes, although it may be caused by structural cerebral diseases, and not ordinarily permanently affecting the health in other respects. The liability to trance, like the liability to various other functional disturbances of the nervous system, does not conflict with general good health and longevity.

If it seem a doubtful thing to class absent-mindedness, or a state of being "frightened to death" under diseases, it must be considered that, strictly speaking, there is no arithmetically defined line between health and disease, but that, as Allbutt has well observed, pathology is but the shady side of physiology.

THIRDLY. This hypothesis explains the difference between trance and ordinary sleep, which in some respects it so much resembles. Sleep is a normal state, a partial cessation of the activity of all the faculties, a lowering of the activity in all the regions, but not a suspension of the activity of any except the

will, which, as we have seen, is simply a co-ordinated action of the faculties. When a person who is sleeping gets up and walks in his sleep, in other words, passes into the somnambulist form of trance, the change that takes place in the brain is this: while sleeping, the activity of all the faculties was lowered; on going into trance the activity of all the faculties becomes suspended, and the entire cerebral activity is concentrated in some one faculty, or limited group of faculties.

Trance differs from ordinary sleep in the following features:

1. The performances of the trance are logical, coherent, and consistent; while dreams are filled with extravagances and absurdities, which to the sleeper seem entirely proper. By the hypothesis of trance here presented, we should expect that the dreams acted while in that state, however exalted they might be, would be restricted and coherent, for they must arise in a limited region of the brain, and are not like the dreams of ordinary sleep, the scattered and confused products of all parts of the brain.

2. In trance some of the senses may be perfectly sealed. The loudest noises are not heard, the most fragrant odors are not observed, and there is no power of taste. While some of the senses are thus utterly closed, others may be greatly exalted. On the other hand, the soundest sleepers are awakened by loud noises, or by sufficiently irritating the sensitive nerves. This sealing of some of the senses is perfectly clear, if we allow certain regions of the brain to be entirely inactive. In sound sleep all regions of the brain are active, although far less so than in the waking state, but in no region is there complete suspension of activity. The explanation of the exaltation of the faculties will be given subsequently.

3. Trance subjects are capable of responding to suggestions offered by a second party, or from any external source, and become consciously obedient to those suggestions. Sleepers present no such peculiarity; they respond to external suggestions addressed to the senses, but not consciously or coherently. The entranced person, according to this hypothesis, is a living, active personality, more active in certain directions than when in the normal state; and yet he is only a fraction of his normal self; consequently he is, or may be at the mercy of any

external suggestion that is offered. He may not be able to resist the external suggestion, as of the so-called mesmerizer, for example, but he responds consciously and consistently through that portion of the brain that is active, and without coming out of the trance. If one in ordinary sleep becomes fully conscious so as to respond intelligently to external suggestion, he wakes up.

4. In some forms of trance there may be divided or double consciousness. The subject, on coming out of the trance, has no recollection of his experience while in it. On again entering the trance, he resumes the experience of the previous attack where it left off, as though no active life had intervened. If he have a habit of entering into the trance at certain times, he really leads two quite distinct lives. In sleep there is no such continuity of existence, from one nap to another. The explanation of double consciousness is referred to under another head.

In strictness, trance is not sleep at all; it is rather another form of waking life, over which the will has little or no influence. It does not rest one, rather it is exhausting, at least in some of its phases, and with reason, for the mental and physical functions are oftentimes exalted.

FOURTHLY. This hypothesis explains the phenomenon of dual life and double consciousness, which has been regarded as one of the greatest and most inexplicable mysteries of trance.

In trance—even in the most profound instances ever observed—there is probably always consciousness at the time, but it is not always or usually remembered consciousness. On awaking, as on awaking from ordinary sleep, the dreams that may have been active and numberless, fade as a cloud; possibly not even a glimpse of them may be caught and held before the mind long enough to become a permanent and recollectible impression during the normal state. But on resuming the trance state, the exalted functional activity of the region of the brain in which the cerebral force is concentrated, is able to bring these impressions of the previous attack of trance, forgotten during the intervening normal state, to consciousness, and thus the subject carries on an independent trance life, just as though there had been no intervening nor-

mal state. On returning to the normal state, the cerebral force being again diffused through the whole brain, is insufficient to enable the subject to recall the experience of the trance, but quite sufficient to enable him to recall the experiences of his previous normal state. Thus he leads two lives—the normal life and the trance life,—and they are independent of each other.

That very great excitements, or unusual experiences or circumstances of any kind, may bring to consciousness impressions supposed to be forgotten, is illustrated in the history of every person at all susceptible; even a little trip in the country, a walk in the woods, a sea-voyage, may have this effect in a most interesting way. Extreme illustrations are the well known experiences of the drowning, or of those in great peril of any kind. A physician at one time under my professional care, told me that he was once thrown in his carriage off a high bridge. In the short interval between leaving the bridge and reaching the ground beneath, forgotten events of his life rushed before him, as in the case of drowning men.

It would also be consistent with this hypothesis, if the subject in the trance state should recall not only previous attacks of trance, but also the general fact of having been in the normal state; for in the normal state the whole brain is active, and in the trance state that portion in which the activity is concentrated would be able to bring to consciousness the acts of the normal life in which that same portion of the brain must have participated. The case of Felida X., recently reported by Dr. Azam, of Bordeaux, France, appears to have been of this character.* In this case the first attacks appeared in the fifteenth year, and at first lasted for but ten or fifteen minutes. The first year, but about one-tenth of her life was passed in these trance attacks; after the lapse of sixteen years her life was about equally divided between trance and health, until finally the former encroached on the latter, until she passed nearly all the time in trance. Through all these years of dual existence she always forgets, during her normal life, the experiences of the trance; nothing seems to

* A translation by Dr. Tucker of Dr. Azam's report, appeared in the *Journal of Nervous and Mental Disease*, for October, 1876.

be competent to bring them into consciousness but the concentrated and exalted activity of the trance itself.

The case of Miss Reynolds, of Pennsylvania, the details of which were published in 1860, was a type of this feature of trance. On coming out of her first attack, which was at the age of eighteen, she forgot all about her former life, and she had no consciousness of previous existence; she did not know her father, or mother, her brother or her sister. After five weeks she fully recovered her normal state, and with it her memory of her life previous to the attack of trance, but not of the trance itself. For years she alternated between trance and health, leading two distinct lives. In trance she was gay and lively, full of fun, and fancy, and fond of social life; in the healthy state she was sedate and pensive, almost to melancholy, slow though sensible in her intellectual operations, and apparently destitute of imagination.

In these cases of dual life the trance life is the more brilliant and active in certain features, as by this hypothesis it naturally would be. In a case under the observation of the late Dr. J. R. Mitchell, a young girl in trance life was quick, energetic, and witty, and vivacious; in her normal life she was slow, indolent, and querulous.

FIFTHLY. The hypothesis explains the difference between the deeper stages of trance, and death, with which trance is sometimes confounded.

With this hypothesis of the pathology of trance before my mind, I have been accustomed to illustrate the difference between ordinary sleep trance and death, by pointing to a chandelier of gas-burners. When all the burners of the chandelier are fully lighted, that is the normal waking state; when all of the burners are turned down low, but not turned out entirely, as usually is the case in public halls, before the opening of entertainments, that is ordinary sleep; if I turn out entirely all the burners except one, and that one, as often happens, flames all the more brightly from increased pressure, that is trance; if all the burners are turned out entirely and permanently, that is death. The only hold on life which the deeply entranced person has, is through the activity of a limited region of the brain, through which feeble movements of

the heart are sustained, the body being, in other respects, motionless. The popular belief that deeply entranced persons are liable to be buried alive is correct, but fortunately mistakes of this kind occur but rarely.

One person, it is said was laid out to be buried, all the preparations for the funeral having been made, of which he was fully conscious, and yet he could not at first speak, or cry, or wake, or move. By a desperate effort at the last moment, he succeeded in slightly moving one of his thumbs; the movement was observed and he was saved, and in time came out of his trance.

In the famous case of the late Rev. William Tennent, of New Jersey, a severe illness—some form of fever—was followed by profound trance, which so thoroughly simulated death that the time for his funeral was appointed, and the people were gathered in attendance. At this juncture his physician, who was also a special friend, insisted that he should not be buried at that time, because a tremor in the flesh, which had been observed when the body was laid out, still continued. A brother of Mr. Tennent became impatient at this suggestion, exclaiming: "What, a man not dead who is cold and stiff as a stake!" The suggestion of the physician, however, prevailed, another day for the funeral was appointed, and the people went away. For three days and three nights the doctor worked over his patient, trying, if possible, to find some other symptom of life than the mere tremor in the flesh, but failed. Again the friends appeared at the hour assigned for the funeral, and again the physician plead for time; at first for an hour, then for a half hour, and then for a quarter of an hour. At the last moment Mr. Tennent opened his eyes. His mouth was pried open, and through a quill, liquid nourishment was conveyed to his stomach, and by degrees the patient recovered; but at first he could not write nor read, and was only able to pronounce monosyllables. It was a considerable time—more than a year—before he gained the recollection of his past life, and his acquirements were fully restored to him. During his slow recovery he took lessons in reading and writing, as in his childhood. It is stated by his biographer that the return of his memory was marked by the sensation of a sudden shock in

his head, as he was reciting Cornelius Nepos. He clapped his hand to his head, and then it seemed to him that he had read that book before; the subsequent return of his recollection of his past life, though gradual, was perfect.

After his recovery, Mr. Tennent stated that the three days in which he had appeared lifeless seemed to him not more than ten or twenty minutes; and during that time he seemed to be transported, under the guidance of a superior individual, to heaven, where he saw an innumerable host of happy beings surrounding an "Ineffable Glory;" he was able to hear their songs and their hallelujahs, and he was conscious of joy unutterable.*

In cases of this kind the heart probably beats very feebly, and not always with sufficient force to be detected by ordinary auscultators.

Rosenthal, of Vienna, records a case of trance in an hysterical woman. She was declared dead by her physician. When Rosenthal saw her, the skin was pale and cold, the pupils contracted and not sensitive to light, no pulse could be detected, and there was relaxation of the extremities. Melting sealing-wax, dropped on the surface, caused no reflex movements. When a mirror was held before the mouth no moisture appeared. It was not possible to hear any respiratory murmurs, but in the cardiac region a feeble intermittent sound could be just detected on auscultation. The patient had been apparently dead for thirty-two hours. On examining the patient with the faradic current of electricity, Rosenthal found that the muscles of the face and the extremities contracted. After twelve hours of faradization, she recovered. Two years afterwards she was alive and well, and told Rosenthal that about the commencement of the attack she knew nothing, but that afterwards she heard people talk about her death, but she was powerless to help herself.

SIXTHLY. This hypothesis explains the exaltation of some of the physical and mental faculties in trance, and depression of others.

The exaltation of the physical and psychical faculties in trance cannot be questioned, but is readily demonstrated; and by

* Life of Rev. William Tennent. New York, 1868.

this hypothesis receives an explanation that is both lucid and complete.

Representing, for the sake of comparison, the quantity of cerebral force in all parts of the brain by one hundred; if the activity of three-fourths of the brain is suspended, then the remaining one-fourth may be four fold more active than when in the normal state. That there should be such a concentration of cerebral force in a limited range of faculties, is in harmony with every day observed facts. Thus the intellect increases in vigor in any direction under exercise up to a certain point, and through over exercise becomes fatigued. In the brain are the centers of thought, of muscular motion, and of general and special sense. It would follow, therefore, that some one or several of the senses, or some one or several of the mental faculties, or some one or several groups of muscles might be exalted in activity, with entire suspension of the activity of other senses, faculties and muscles, according to the region of the brain in which the concentration of activity takes place. There is, therefore, no mystery in the frequently observed, though sometimes disputed fact, that entranced subjects can raise with ease weights which in their normal state they are unable to move. Mesmerized subjects sometimes exhibit this power. Persons entranced through fear, as by an alarm of fire, have been known to take up a stove and carry it out of the house; the next day they cannot, to save their lives, carry back that stove. The co-ordinating or balancing power may be so much exalted in somnambulists that they can climb without harm in most dangerous places. A case in point is related by Dr. Brown-Sequard of a young lady in Paris, who, every Sunday, at ten o'clock, was seized with ecstatic trance; and during the attack would get on a bed, put her toes on the edge, take an attitude of prayer, and offer supplications to the Virgin Mary. In this position, impossible to any one in a waking state, she would stay for a long time, fixed as a statue, her chest moving, her heart beating, and her lips uttering sounds, but the rest of the body absolutely still. The exaltation of the time telling power—which sometimes passes for second sight—has the same explanation as the exaltation of other faculties. Likewise the

nerves of general and special sense are all liable to be greatly exalted in this state; the feeblest whisper in a distant room may be readily heard, and one can read by a dimmer light than is usually needed. The sense of touch may be so delicate that when the sense of sight is sealed, the subject can find his way from room to room without injury; and it is claimed may, in some cases, recognize the presence of another person near at hand, by the temperature alone, even where there is no physical contact.

These exaltations of the normal senses are the bases of many of the popular and professional delusions relating to "second sight," "clairvoyance," "thought reading," and the like. By this hypothesis also any of the mental faculties should be liable to be exalted. Observation shows that not only the imagination, but the reasoning faculty and command of language are oftentimes greatly enlivened in their activity in this state, as the performances of trance preachers illustrate. Weak minded men and women, who in the normal state think little and say less, are sometimes able, when entranced, to speak continuously, and almost if not quite eloquently, and with slight apparent effort. While there has been much exaggeration of the originality and value of these trance speeches, yet it can not be denied that they are, with all their wildness of fancy and repetition, and frequent senselessness, far beyond the capacity of the same persons when not entranced. On returning to the normal state, they may be utterly stupid or commonplace; their cerebral force, when diffused through the whole brain, is unequal to even rapid and sustained small talk.

The converse of exaltation, depression of some of the senses and faculties of the mind, directly follows from this hypothesis of concentration of cerebral activity; those senses and faculties that belong to the entirely inactive regions of the brain, must be for the time practically dead, as is found to be the case in some forms of trance. Thus the sealing of some of the special senses and general anaesthesia, making it possible to perform without causing pain certain surgical operations, are accounted for.

SEVENTHLY. This hypothesis explains all the familiar

physical symptoms of trance, such as flushing of the face, fixity of position, sighing respiration, accelerated pulse, involuntary convulsive movements, and marvellous and numberless hysteroid sensations.

The effects of trance on the pulse and respiration, and on the circulation in general, are what would be expected from the known inter-dependence of mind and body. The quite recently established fact of the existence of definite centers of muscular motion in the brain, however the fact may be interpreted, is of great significance in its bearings on this subject, since it shows clearly why convulsions so frequently accompany trance. The aphorism that I have elsewhere laid down, that when we think we move, was based on our knowledge of the existence of these centers of muscular motion, in that portion of the surface of the brain that is regarded as the seat of some of the mental faculties, and was first suggested to me while repeating the experiments of Hitzig and Ferrier in the electrical irritation of the brains of animals.

These convulsive movements in trance, as in hysteria and epilepsy, belong to the lighter phases, or to the coming in and going out of the attack; in the deeper stages the muscles are motionless.

Whether the entranced subject walks about, or remains fixed and immovable, probably depends on the nature of the dream that arises in the portion of the brain the activity of which is exalted.

The vague nervous sensations that often accompany the early and lighter phases of trance-sensations, as of electric shocks, of heat or of cold, of crawling or creeping, or twitching—are in harmony with what the neurologist every day observes in various temperaments where the brain in whole, or in part, is excited. In very many persons the simple expectation that their symptoms are to appear, is sufficient to bring them in full force.

EIGHTHLY. This hypothesis accounts for the illusions and hallucinations of trance.

Illusions, delusions, and hallucinations, are, as is established, the products of cerebral activity, and are frequently the symptoms of some abnormal state of the brain. There is no

proof that any other part of the body than the brain, as the spinal cord or nerves, can originate hallucinations, any more than there is proof that any other part of the body can originate the higher modes of conscious thought—all the facts and arguments that serve to establish that the brain is the organ of the mind in health, also establish that it is the organ of the mind in disease. For while automatic acts, as nursing and so forth, may be manifested by brainless infants, and while the spinal cord clearly contains centers of reflex action, yet there is no proof that any conscious thought, of the *higher* kind at least, attends the activity of these reflex centres, any more than in the familiar automatic movements of plants. The hallucinations of trance—the visions of heaven and other innumerable fancies—must then, like dreams, and all mental operations, whether coherent or incoherent, have their seat in some part of the brain; and, according to this hypothesis, their existence, their coherency, and their extreme activity, are all explained.

Illusions and delusions may arise in brains that are in a normal state, through the necessary deceptions of the senses, but many of them are in part, at least, of a transient character, and are in various ways corrected; but in trance both the false perceptions (illusions), and the false conclusions from what is perceived (delusions) are permanent, and in many cases are immensely more absurd than ever arise in the normal state.

NINTHLY. This hypothesis accounts for the relation of trance to its admitted predisposing and exciting causes.

By this hypothesis any influence that tends to overthrow the cerebral equilibrium, to disturb the balance of innervation, would be likely to be a cause of trance; experience shows that this is actually the case.

The predisposing, like the exciting causes of trance, are both physical and psychical.

One is physically predisposed to trance, so far forth, who inherits, or has acquired a nervous system generally sensitive and impressible. One is psychically predisposed to trance who is mentally unbalanced through excessive and disproportionate endowment of imagination and emotion. One who is powerfully developed in reasoning and thinking qualities,

and is badly deficient in observing, practical faculties is so far forth predisposed to the intellectual form of trance. The best subjects are those who are predisposed, both physically and psychically, who have sensitive organizations, and unbalanced, ill-trained minds.

A typical subject for emotional trance, especially the mesmeric form, is the average shop-girl; she is usually delicate in body, feeble in mind, or rather, all that is in her of mind runs to emotion, and that little is but half matured; it is almost as easy for her to become entranced under exciting causes as it is to laugh or cry. Persons of this mental calibre and immaturity, of either sex, are predisposed to trance, even when physically they are very strong. Trance is not, however, as many suppose, the peculiar gift of certain temperaments. It is the property of the human race. All persons are liable to become entranced, just as they are liable to become paralyzed or epileptic, although all do not suffer in this way. All persons are not predisposed to the same form of this disorder; one can only be entranced through the intellect, another through the emotions; one person can only be frightened into this state; one needs the presence of a medium, another of a mind reader, another of a clairvoyant, and another of a mesmerizer; another of a magnetized letter, and another still of one who performs miracles of healing by the laying on of hands. Mr. Grimes, who has had much experience with the mesmeric trance, and who is accustomed to direct his subjects to stand still with closed eyes and folded hands as a means of exciting the emotion of reverence, says that he failed with every one out of forty military officers at West Point, while just across the river, among the operatives, the same process was very successful.* This is easy to understand from what

* Mr. Grimes has recently published a work, entitled "Mysteries of the Head and Heart," the latter portion of which especially is commended to the attention of those who are interested in these themes. Mr. Grimes is almost the only writer on trance who has had sufficient originality and mental force to see more than one side of it. But, like Dr. Carpenter, and most other writers on these subjects he fails to see all sides, and he makes the mistake which is fatal to the scientific study of trance, of conceding the possibility of thought reading. This serious mistake results from the studying the subject inductively instead of deductively; it is, indeed, as I shall show farther on, an inevitable mistake from that false method of reasoning.

has already been stated in regard to the predisposing causes, but it would be an error to infer that those officers were not capable of being entranced. If they should all sit in a circle around a table for half an hour or more, with the expectation that some strange things would develop, very likely some of them would become carried away, and, by unconscious muscular motion, would move the table, or perhaps they would feel sensations like electrical shocks through their bodies, or they might go into convulsions, or might experience wonderful visions, hearing the voices and seeing the faces of loved ones.

TENTHLY. This hypothesis accounts for the periodicity of trance in certain cases.

It is the nature of all functional nervous diseases—neuralgia, sick headache, hay fever, inebriety, and some forms of insanity, to appear more or less periodically. It may be said, I think, that the majority of cases of spontaneous trance are periodic. Several of the cases reported in this paper to illustrate various points, it will be observed, agree in this element of periodicity, though widely differing in other features. The famous case of the French sergeant, for example, is a striking illustration of the periodicity of this disease. According to Dr. Mesnet's report, the attacks of trance in this case came on after a hemiplegia, which followed a wound in the head received at Sedan. From one to two or three days of every month are passed in this state, into which he enters spontaneously and instantaneously. While in trance the sense of touch is much exalted, the sense of sight appears to be limited to those objects with which he is brought in direct relation, and is only excited into activity automatically by the sense of touch; all the other senses are sealed. The excessive activity of the sense of touch appears to supply the place of the other senses in a measure, so that he eats, drinks, smokes, dresses and undresses, and retires to bed as in his normal state; but throughout mechanically responds to external suggestions.

Here, as it would seem, I might close the case, with all the real phenomena of trance accounted for, unified, and harmonized by this hypothesis of concentration of activity in a limited region of the brain. It may be opposed to all this process of reasoning, that no one has ever seen with his eyes the

brain thus concentrating its force during an attack of trance; but it must be remembered that only exceptionally can scientific hypotheses be verified by actual sight. Even in the material world the seen is but a fraction of the unseen. No man ever saw the waves of light; no man has ever seen gravity; these universal forces are studied only through their phenomena, by means of which we frame hypotheses of the law of gravitation, and the existence of a luminiferous ether. In the realm of physiology and pathology, the chances of verification by actual sense perception are more rare than in astronomy or physics. Only by deduction can we arrive at any idea of any functional disease whatsoever, or of the relation of mind to brain.

It is essential to the validity of a scientific hypothesis that it account for all the phenomena, and that it be the only hypothesis that will account for them. The supernatural hypothesis of trance, which is the one that has been most generally entertained, even if there were no other argument against it, must be dismissed at once, as soon as it is found that the phenomena can be fully explained by natural causes.

Although we have the authority of the best writers on the principles of science, Whewell and Jevons, for accepting an hypothesis if it be singly and solely competent to account for all the phenomena; yet the best hypotheses, as it seems to me, will bear even severer tests; they will shed light on other and allied phenomena, and will point to new and previously unknown phenomena, for which they will also account. This hypothesis of the nature of trance will bear, in a manner, this severe and supplementary test. It puts us in a position to predict, from our knowledge of the mental and physical characteristics of an individual, whether he will or will not be likely to become the victim of any form of trance. This hypothesis is also of material assistance in studying the automatic functions of the brain and the relation of automatism to responsibility, which just now is the battle ground of science.

This hypothesis also assists us in obtaining a general idea of the nature of sleep, explaining in a general way the philosophy of dreams, the cause of their incoherency, their relation to trance, and the cause of loss of will in that state.

Thousands, if not millions, of pages have been written on the will; all metaphysics is complicated by discussions on, and obscured by ignorance of the nature of this element of the mind. In the light of this theory of trance, the will is not any single, or special, or separate faculty, but the co-ordinated action of all the faculties; and the reason why, in trance, the will is displaced is that the activity of a considerable portion of the faculties is suspended. There is scarcely a problem in psychology that is not simplified by this explanation of the nature of the will, as all who are familiar with the literature of the subject will perceive.

In regard to the other popularly alleged phenomena of trance,—clairvoyant, or second-sight power, or the existence of a sixth sense, by means of which the subject is able to see around and through the world, and into other worlds, or to tell time through the back of the head, or to read with closed eyes, or to see through opaque objects, or to discover lost persons and property, or to reveal the past, or to prophesy with precision, to communicate with spirits of the departed, or to raise the dead—in regard to all these claims, and every claim allied to them, I may say that there are not, and never have been, and never can be any such phenomena. How do we know that phenomena of this kind never have existed and never can exist in the trance? It is not a matter of opinion, or of the *ipse dixit* of any man, or of any number of men; it is a fact capable of absolute proof that no phenomena of this kind have ever appeared in the world in any human creature, in trance or out of trance.

How do we know this? Surely not through inductive reasoning, which is the method usually resorted to in studying this subject. No amount of inductive research will ever advance this branch of science one inch. Suppose that there are a thousand clairvoyants, and mediums and mind-readers who profess to have these powers, and that by the investigation of some competent expert (and none but an expert can conduct investigations of this kind), it is shown that none of them are justified in their claims, that all of them are intentional or unintentional deceivers, what have we found? Simply nothing. We leave off where we started. How do we know that the

next clairvoyant does not have the power that she claims to have? How do we know that even these one thousand may not have had the powers they claim just before our investigation, or just after? You say that exposures of this kind diminish the probability that any one has these gifts. Very true, but in science we are not to be content with a low degree of probability when we can get certainty; and on this subject we can get certainty. I have no sympathy, therefore, with the habit, honored though it may be by the endorsement of some of the greatest names, from the committee of the French Academy down—of offering large sums of money to those who will display these marvelous gifts. No plan conceivable could be more unscientific than this. Two years ago, a friend of mine much interested in these themes, and uncommonly successful in the study of them, remarked to me, "I have laid by a few thousand dollars, the results of labor and saving; I will give it all to any one who will read the mind of another." He gave me authority to publicly use his offer, which I did not do for the reason I have given. I observe that offers of this kind find no takers, for no one ever was endowed with any of these divine powers; but the fact of their non-acceptance is negative evidence merely, and leaves the subject where it found it.

The true way, the only way to settle this question, is through deductive reasoning, by the application of this law of nature, devised from the experience of all authorities in physiology—namely, that no human being ever has any faculty different in *kind* from that conferred on the human race in general. The law is of universal application, and may embrace all species of living things; but for our purpose here it is sufficient to limit it to the human race. The difference between Socrates, Newton, Shakespeare, and Milton, and the lowest type of society is a difference of degree only; all the mental faculties are common to all. None of the real phenomena of trance, as above detailed, differ from those that are common to the human family otherwise than in degree. When, therefore, we hear these wondrous stories of second-sight and thought-reading, though endorsed, as they oftentimes are, by the ablest and most honest scientific men of the world, we need spend no

time or force in investigating them; deduction proves their falsity without any examination.

We can, if we choose, and are competent to do so, verify and illustrate our deductions by exposure of those making these claims, but let us beware of making these exposures with the idea of proving anything. With the masses of the people, who are moved by their instincts, these exposures count for much, I admit; but science has no need of them, and save in exceptional cases, when incidentally they lead to positive and original contributions to science, as in the case of the Fox girls, the table lifters, and Brown, the mind-reader, derives no aid from them in settling this great question.*

* Lest I may be accused of inconsistency, I may say that whatever I have done during the past few years in the way of detecting and exposing mediums, clairvoyants and mind-readers has been, not for the purpose of ascertaining the truth or falsity of the claims made by these performers and their advocates, since that question is, as I have stated above, settled definitely and forever by deductive reasoning, but partly in order to solve some questions relating to the psychology of jugglery—a most instructive and much neglected subject—and partly, also, out of regard to the weaker brethren who are unable to employ deductive reasoning, and can only be taught through what, in some way, appeals to the senses. These exposures are, in strict logic, no absolute disproval in the abstract of the claims made by those who are exposed; but their influence with the people, even with physicians and scientific men, is, as I have found by experience, enormously greater than any scientific method of treating the subject possibly can be. Thus, in the case of the Eddy Brothers, who contracted the habit of raising the dead in immense numbers, in an out of the way hamlet of Vermont, deductive reasoning was, to one who knew how to employ it, amply sufficient, without any attempt at special verification, to disprove the claim; and yet there were in this country thousands of persons, many of them of the highest intelligence, and some of them of scientific distinction, who, up to the time of my published exposure, were not a little uneasy in mind in regard to what was alleged, on excellent average testimony, to be performed there.

Likewise in the case of Brown's mind-reading—in some respects the most original and remarkable performance connected with delusions—comparatively few, even of physicians and physiologists were able, at once, to grasp the true, though somewhat complex explanation which I gave—unconscious muscular tension and relaxation on the part of the subject—although the theory was confirmed by careful and repeated experiments; but the incidental comparison of the mind-reading seances to the "learned pig" exhibitions, in my letters to the *Tribune*, was more effective in bringing the trickery into contempt, as I have various reasons for believing, than any published reasonings or explanations.

Likewise the common objections that these delusions do no good and much harm, and add nothing to the treasury of human knowledge, have no place in science, however useful they may be in practically dealing with the people.

In regard to all these claims, it may be said that in all cases whenever the hand of an expert touches them they vanish into air. Non-expert human testimony of vast proportions, in favor of all these claims, crowds our libraries and our newspapers; but the testimony in favor of witchcraft, of alchemy, of magic, and of astrology is incomparably more imposing; but non-expert human testimony in matters of science is, as you are aware, of no value, and no force of numbers can give it any value. No process of addition can make knowledge out of ignorance; a million ciphers are worth no more than one cipher. A strong boy standing on the shore tries to throw a stone across the Atlantic, and fails; a million boys come to his aid, and each one tries to throw a stone; all combined shall not help that first boy, nor come much nearer to reaching the other shore, though they may toil forever.

The cures of disease wrought on trance subjects are oftentimes genuine cures—the result of mind acting on body, as I have proved by a systematic series of experiments wherein even without the aid of trance, I accomplished, and have, in my paper on the subject before the American Neurological Association, pointed out in detail the way for others to accomplish most remarkable and oftentimes permanent results in serious cases of disease,—results which formerly were regarded as miraculous.

An excellent parallel to the superstitions connected with trance, is found in the perpetual motion delusion. For centuries the belief that perpetual motion was attainable, dominated in the civilized world, and, like the delusions of second sight, clairvoyance, and so forth, was most active in the intelligent classes; thousands upon thousands of machines have been devised, which, by their inventors, and by their friends, were supposed to have solved the problem, and no amount of inductive investigation could ever have availed to settle the question, since but a minority of claims could be exposed by expert skill, and in every direction new claimants

were appearing, and likely to appear. Not until physicists were able to demonstrate deductively through the law of the correlation and conservation of force, that perpetual motion was impossible, was the delusion dispelled. At the present time all classes of perpetual motion are disallowed by physicists without a moment's examination. It would be as much a violation of the established and unvarying laws of nature, for one person to have any faculty different in kind from those belonging to the race in general—such as second sight, or clairvoyance, or mind reading, or prevision, or retrovision—as for the sun to rise in the west instead of the east; by legitimate deductive reasoning the one claim is as conclusively disposed of as the other.

It was only by deductive reasoning that the delusion of alchemy was gradually overcome. The belief prevailed in Europe that the baser metals could be turned into gold; the ablest minds were influenced by the delusion; even Sir Isaac Newton, it is claimed, did not escape the infection. Throughout Europe, indeed, alchemists were for centuries as common and as annoying as clairvoyants and mind-readers are to-day; and induction was equally powerless against them, and for the same reason. As chemistry passed slowly out of the territorial into the organized stage, it became possible to prove deductively that baser metals could not be turned into gold, and claims to that effect ceased to be examined. In his one department of astronomy, Sir Isaac Newton was perhaps the greatest master of deductive reasoning that the world has ever seen; but in studying alchemy he was but a layman, a non-expert, and blundered accordingly; and in this respect, if in no other, his example has been imitated by a number of eminent judges, physicists, and naturalists of our day.

Another excellent parallel drawn from physiology is found in the belief, in this country at least widely prevalent, even among the educated classes, that oculists can take out the eye in a living patient, clean it, and put it back again. Thousands of individuals of general intelligence are positive that they have seen, with their own eyes, this operation performed, and many of them would be willing to swear in court

to that effect; patients themselves, as an oculist of reputation, Dr. Matthewson informs me, are positive that this operation has been performed on themselves. To meet this delusion by exhaustive investigation, by exposing, in detail, every claim of this kind that is, or has been, or will be made in the world, is manifestly beyond human power; and if such exhaustive exposures had been made, the possibility that such an operation could be performed might still be urged. Only by deductive reasoning—by the recognition of the absolutely established physiological law that it is as impossible to detach the eye from its nervous, vascular, and muscular connections, and restore it to those connections, not only unharmed, but benefited by the procedure, as is claimed, as it would be to cut off the head and put it back again on the living man—can this delusion be successfully met.

Those who have followed my argument thus far, will find no difficulty in accounting for the fact, that the trance has for so long a time been a refuge and a hiding-place for the world's great imposters. The essence of a delusion is ignorance, and in all ages the delusions of mankind have sheltered themselves in the darkness of the unexplained phenomena, and have retreated as fast as light is let in upon them. As astronomy rose astrology sank; as chemistry was developed, alchemy died away; as medicine became something of a science, witchcraft lost its vitality; the trance and the automatic side of human nature have been so full of mystery that in them the delusions of our time have made their last stand, from which they are already beginning to retreat.

It is the belief of the wisest men of our time, that there is a scientific substratum to delusions. This belief is well founded; there is a scientific substratum to delusions, and it is found in the subject under consideration, and it is for that sake alone worthy of the study of all physiologists who are competent to make themselves masters of this branch of inquiry.

Those who fully understand the nature and symptoms of trance, as I have here described them, and the involuntary life of which trance is, so to speak, the triumph and culmination, may remain assured that they have possessed themselves of all

that is genuine and important in witchcraft, in clairvoyance, in spiritualism, in mind-reading, and in animal magnetism, which latter is the mother of all modern delusions, being, indeed, to our century what witchcraft was to the fourteenth.

In the light of the theory here proposed, it will be seen that trance has a two-fold interest, scientific and practical—scientific in its relations to both physiology and pathology, and practical in its bearing on the principles of evidence, as obtained through human testimony.

There are various reasons why all that portion of logic, as taught in our colleges and schools of law, that treats of human testimony, must be radically reconstructed, and when this reconstruction is made, as it surely will be, it will be found that much of what is called history, is subjective rather than objective, originating in the brain rather than in external nature; and it will be seen that not an inconsiderable portion of our libraries can be laid aside and forgotten without detriment to the cause of truth, and with large advantage to those who wish to make the wisest use of time. The necessity for thus reconstructing the principles of evidence is based, in part, though not entirely on the fact that all persons are liable to be entranced, and that when in that stage their own statements of what they experience is of little or no value.

On legal medicine trance has a direct and most important application, and in four ways:

First. Testimony as to crimes committed under circumstances of great excitement. Arson, murder, and even theft, especially burglary, may cause or be attended by so much of fear or terror on the part of those who witness them, either sufferers or by-standers, that their testimony as to what occurred may become of slight value. The possibility that witnesses may be entranced through the emotion of fear, is worthy of fair consideration in all cases of this kind where details are testified to and insisted on, and where there is important conflict of evidence between witnesses.

Second. Testimony relating to sudden accidents, attended with fatal or serious consequences.

The value of testimony often brought before coroners' juries is impaired, and quite frequently neutralized altogether by the

fact that the excitement of sudden accidents tends to entrance those who are directly concerned; and thus the attempt to fix responsibility in such cases so often miscarries. A typical instance is found in the disaster that occurred to the yacht *Mohawk*, in New York harbor, last summer. It will be remembered that this yacht was suddenly capsized, and thrown completely over while getting under weigh, one afternoon, off Staten Island. Commodore Garner and wife, and several others were drowned. The captain was quite generally blamed, and there was a strong desire among the people to have him indicted for criminal negligence. The testimony given on the trial before the coroner was far from being satisfactory to impartial minds, and the captain was discharged. In cases of this kind newspapers are violent, and call for the blood of those whom they suppose to be unpardonably negligent; but coroners' juries, following their intuitions or their feelings of compassion are unwilling, as a rule, to convict on the testimony usually brought before them; and in this respect they are right, although they may not know why. Their impulses and their intuitions are wiser than the logic and eloquence of editors and preachers. Imminent peril and unexpected disaster, threatening or injuring life are likely to excite trance, and thus to diminish the value of the testimony of the parties concerned, to such a degree that we should pause before inflicting punishment. In the case of the *Mohawk*, the squall was so sudden, and the capsizing of the yacht so quick, and the position of those on board so perilous that any attempt to ascertain just what transpired may as well be abandoned. We shall never know what occurred after the squall struck the yacht in sufficient detail to punish any one.

There is no doubt that persons in responsible positions sometimes become entranced as peril approaches, and thus they are liable to take precisely the wrong course, and to do that which they especially wish to avoid, like a mesmerized subject. A few years since, while returning from Europe, our steamer collided with a sailing vessel, under these circumstances. It was a starlight night, and the sailing vessel was sighted at least fifteen minutes before the moment of collision, and was not lost sight of during that time. The vessel was coming across

our bows. Under right management on the part of the officer of the deck, a collision would have been impossible. If we had stopped, if we had backed, if we had kept on our course, if we had turned to the port, all would have been well. There was but one way in which it was possible for us to run into the sailing vessel, and that was by turning to the starboard and chasing her. That course the officer of the deck took, and succeeded in running into and knocking the masts out of the sailing vessel. There was no suspicion of intention; there could have been no motive. The officer in charge was not over-experienced, probably became entranced, and did just what he terribly wished to avoid doing.*

In cases of this kind, the responsibility, legal or moral, belongs to those who allow men of insufficient capacity or experience to take positions for which they are not adapted. For what the man does or does not do at the time he is not criminally responsible. In those who have the right capacity for a responsible station, and whose experience in that station has been large, the liability to become entranced through fear is reduced to a minimum.

Third. Testimony relating to alleged crime or wrong deeds committed by entranced persons.

It is quite rarely that subjects in any form of trance are accused of committing crime while in that state, for this reason,

* On this occasion was also illustrated, in a most interesting way, the power of fear to entrance large numbers of individuals simultaneously, causing them all to see precisely what they feared to see. After the collision, the passengers from the cabin and steerage rushed on the quarter-deck, many of them overcome with terror, and nearly all of them supposed that our steamer was seriously injured. The sound of the falling spars, unspeakably dismal in the darkness, the roar of the wind, which seemed, as usual, to rise at the critical moment, the difficulty and awkwardness that attended the slow lowering of the boats on the dashing waves, the shrieks and prayers and cries of the passengers, all combined to make the emotion of fear the master of the occasion. In the height of the excitement, the cry went forth that our steamer was stove in, and that the bow was sinking. Straightway all eyes were turned toward the bow, and to every eye it seemed to be sinking. I shall never forget how that bow gradually lowered in the darkness, as I anxiously gazed upon it; and yet, so far as I was able to judge, I was more angry at myself for not having taken some other steamer than fearful of shipwreck. Probably all, or nearly all the passengers would, if necessary, have testified in court,

mainly, that the commission of crime requires, usually, the exercise of the will; although, as in some forms of insanity, the will may be irresponsible. The automatic movements of entranced subjects, whether called forth by external suggestion of any kind, or of a subjective origin purely, can rarely lead to positive crime; although they may accomplish some form of injury. It is conceivable that a mesmerized subject might, under the influence of external suggestion, strike a blow that would injure some one; but there could be no deliberate, sustained attack, with a view to injure. Again, the very suggestion of crime, or serious evil-doing, of any kind, to a mesmerized subject, seems to have the effect to restore the equilibrium of the brain, like a physical jar, or knock, or push; and he comes out of the trance, at least sufficiently to be able to resist the suggestion. Of the large numbers of cases of trance I have seen, I do not recollect any instance of evil doing of any kind. Mr. Grimes, who has devoted his life to the practical study of the subject, declares that subjects, even when fully under the influence of the operator, and ready to act according to the suggestions he gives, will not do an indelicate thing. Say to a young man who has gone into a mesmeric trance with

under oath, that the bow of our steamer gradually sank before them on that night; and yet, the bow did not sink, the steamer was uninjured. For the circumstances of that accident, substitute the pretense of mystic or supernatural power, through the agency of an oracle, a seeress, a sorcerer, a necromancer, a witch, a conjurer, a juggler, a magnetizer, a medicine man, a medium, a clairvoyant, a mind-reader, or a repository of animal magnetism, or odic, or psychic force; for the excitation of the emotion of fear, substitute the excitation of the emotions of wonder, reverence and expectancy, combined with fear, and we are in a position to estimate the value of the literature of delusions.

The day before the burning of the Brooklyn theatre, I lectured on this subject in that city, and remarked that an alarm of fire was one of the best exciting causes of trance. The confirmation of this view the following day was of a most remarkable and unusual character. Probably the majority of those in the theatre were more or less entranced; some being unable to move, others unconscious of what they did, and unable to tell what happened or what they saw or heard. How animals are entranced through fear is shown by the conduct of horses when stables take fire; by the experiments of Czermak with crawfish, hens, frogs, and so forth; and by the ease with which snakes charm birds, and draw them helpless within easy reach; but in perilous circumstances masses of men are little or no better than animals.

the belief that the so-called operator will have an influence over him, that he is a lawyer, and the jury is before him, and he will proceed with an eloquent, if not logical plea; tell him that he is in an orchard, and that the ground is covered with fruit, which he may pick up and distribute to the audience, and he will do as suggested; hand him a broomstick, saying that it is a lady, and he will put his arms around it; give him a brick, and tell him that it is a baby, and he will hug it; and yet, if that same young man, while in that state, at the mercy of the operator apparently, be requested to expose his person, he would at once refuse, the suggestion acting perhaps as a means of bringing him out of the trance.

In the case of *Tilton vs. Beecher*, it was claimed privately by the counsel for Mr. Beecher (if newspaper reports are correct), and publicly by the committee appointed by Mr. Beecher, that Mrs. Tilton was entranced at the time she signed some of her contradictory documents. Dr. Corey, of Brooklyn, who has had much experience with diseases of the brain, testified before the committee, according to their report, that the conduct of Mrs. Tilton could be explained on that theory. It is conceivable that so simple a movement as the signing of one's name to a false document of terrible import, might be automatically made by a mesmerized subject, at the suggestion of the person whom she supposed put her into the trance. There is, however, no published evidence that Mrs. Tilton was in a trance at the time referred to, and no certainty, if she were in that state, that she was in a condition to respond in detail automatically to the suggestion of any one. Granting that she was entranced through a combination of physical weakness and mental excitement which is possible, the suggestion that she commit the the great crime of charging unjustly a great crime on another, would have been likely to have brought her out of the trance.*

Fourth. Testimony in the trial of those who, under pretense of going into trance, defraud the people.

Nothing is easier to counterfeit, after slight practice, than the early physical symptoms of trance; the closing of the eyes,

* Dr. Mesnet, of France, states in his report on the case of the French Sergeant, that he has known of two cases of trance that ended in suicide.

the jerking of the head, the general twitching of the muscles, and the sighing respiration, can all be simulated by even a poor actor so perfectly that an expert cannot, without careful investigation, be sure of the deception. The exhaustion, on coming out of trance, is also readily counterfeited. The great majority of public clairvoyants, seeresses, and thought readers, keep out of trance, and while they pretend to go into it, entrance their visitors through the emotions of wonder and expectation, causing them to see what they are told to see, hear what they expect to hear, and to tell them the secrets they wish to know, and thus they accomplish their fraudulent purposes. I have had interviews at various times with many of the most famous clairvoyants in the country, and under circumstances where I had all possible opportunity of judging, and I have yet to see a sure case of genuine trance among them.

An expert is justified in testifying in court, first, that these impostors do not go into the trance at all, as a rule, very few of them having the power of self-inducing that state, and that those who do have that power have no use for its exercise when any fraud is to be brought about; and, secondly, that even those who can induce trance in themselves, do not have, while in that state, any of the powers which they claim, as is proved deductively by the known law of physiology already mentioned. All of these persons, therefore, whenever they profess to have powers different in kind from other persons, *i. e.*, to find lost persons, or property, or to tell the past or the future, or diagnose disease, or to raise the dead, are guilty of fraud before the law, and when they are tried, if expert testimony is received in court, must be without exception, convicted.

On the other hand, if average human testimony—which in this, as in all scientific matters, is vastly worse than no testimony at all—be received, these deceivers must in every case be acquitted; for in this country ten non-experts can be found to testify in their favor to one who will testify against them. It is for this reason that trials of these cases in this country have been, without exception, so far as I know, disgraceful both to science and to law. In the famous Ward case, in Detroit, for instance, where an attempt was made to break a will on the ground that it was made under the influence of me-

diums, no single witness competent to testify on the subject, was called by either side, although the trial was a long one; while public mediums, whose lives are devoted to crime, (among them, I believe, Slade, just convicted in London) were called to give their opinion as experts. What would be thought of summoning some local Lucretia Borgia as an expert in a poisoning case, or some member of the Molly Maguire gang, in a case of murder.

A few years since, according to a newspaper account, a clairvoyant pretender was arrested in Bridgeport, and went through the form of a trial for deceiving a shop girl. A dozen, or more shop girls were allowed to testify that the accused had divine powers, and consequently she was acquitted, and borne off amid the plaudits of the mob.

It may be objected both to the theory and the practical conclusions from the theory here advocated, that even granting their entire soundness in the abstract, they would, if generally understood and held, have a paralyzing influence by encouraging the sceptical spirit, both in science and in law. To this I would reply, that scepticism is a relative term merely, and, rightly viewed, is but another form of belief. Strictly speaking we are all believers. We can no more avoid believing than we can avoid breathing. Superstition and science are both credulous, only that the one believes the false, the other the true. Science is indeed but a higher form of faith; it knows what to receive and what to reject. If the distinction between belief and scepticism be retained, it may be said that superstition is the real sceptic, ignorance is the doubter, and science the only believer. Facts, such as are here urged, are therefore the strongest of all bulwarks against scientific and popular scepticism, against that most baneful of all forms of infidelity so prevalent everywhere, but especially in this country, that rejects everything except average human testimony, that makes the emotions the masters rather the servants of reason, and in seeking for objects of its faith, insists only on one condition, namely, that they be untrue.

As regards trance, there is required no better proof of the need there is of studying it, and of reducing it to a science, as in the present essay I have attempted to do, than the fact that

up to the present moment the tendency has been, even among physicians and physiologists, to reject the real and demonstrable symptoms of this state—such as loss of will, automatism, double consciousness, and exaltation of the faculties, and to accept as genuine the impossible claims of clairvoyance or second sight.

If it be claimed that the application of this theory of trance to law, though ideally right, will be practically impossible, I find my reply in the fact that our courts of justice are already acting upon these principles, and with good results. For a long time now it has been the custom to call experts in cases of suspected poisoning and insanity, and yet every time a lawyer summons an expert, he abandons Greenleaf, who, in his very ably written chapter on the principles of Evidence, as introductory to the Harmony of the Gospels, places honesty as the first qualification for a witness.

One reason, though not the only reason why experts are called in cases of insanity, is that the evidence of the senses, as such, is beginning to be regarded as of little value. Everybody can see the insane, but only a few can see them with expert eyes.

It will now not be a very long step for the law to take to embrace in full the suggestions I have offered, and to accept the principle that in matters of science average human testimony as such, is absolutely worthless. To do so they must throw overboard the principles of evidence as taught not only in books and schools of law, but in all our courses on logic and metaphysics, and in our colleges and schools everywhere, and, as assumed by all who attempt to reason on any subject whatsoever; they must throw overboard the metaphysician, Thomas Reid, who, in his text-book on the intellectual powers of man—long time an authority in Europe and America—uses these words: "An upright judge will give a fair hearing to every objection that can be made to the integrity of a witness, and allow it to be possible that he may be corrupted; but no judge will even suppose that witnesses may be imposed upon by trusting to their eyes and ears; and if a sceptical counsel should plead against the testimony of the witnesses that they had no other evidence from that declared than the testimony

of their eyes and ears, and that we ought not to put so much faith in our senses as to deprive men of life and fortune upon their testimony, surely no upright judge would admit a plea of this kind. I believe no counsel, however sceptical, ever dared to offer such an argument; and if it was offered it would be rejected with disdain"; they must throw overboard Phillips and Greenleaf, Edward W. Cox, the eminent English lawyer, and legal author, who even declares that if the senses of honest and intelligent observers are not to be trusted, we must close our courts of justice.

These authorities which I have quoted—not as uttering peculiar views on this subject, but simply as representing the current notions of the world—will be, are, indeed already, being thrown overboard, for in this direction, as in so many others, human instinct is wiser than human reason; even as I write the cable brings the tidings that the justice before whom the trial of Slade is conducted, has decided that on the accused rests the burden of proving in court that his trickery is wrought through the aid of supernatural beings. This view of the justice is not the correct one, according to the ideal presented in this paper, but it is probably the longest step ever made in the direction of that ideal, for it implies an abandonment of the custom of settling these questions by the testimony of the dupes of the deceivers. If the testimony of scores of honest persons, including some of the ablest scientific minds in the world—who believe that Slade is aided by supernatural powers, in other words, is a doer of miracles—should be allowed to have great weight in his favor, as in this country it certainly would, he must surely be acquitted at once; for it is not yet fully recognized that only experts are competent to deal with these subjects, and it is not generally known that seances of this kind are the best of all exciting causes of trance; so powerful indeed that only rare and peculiarly organized minds can at first resist them, and that only after long and special study of the phenomena of the nervous system in health and disease, can any one even begin the investigation of this department of science. It is one symptom of trance that one does not usually know that he is entranced, and will swear that he is in his right mind, as the intoxicated man will swear that he is sober.

Just now, in the present infancy of this subject, it would be difficult to try these cases in court by expert testimony, for competent experts are very rarely found. In England, Dr. Carpenter, who has labored so hard, and, in some respects, so successfully in this department of science, is yet so far out of the way as to concede the possibility of thought-reading; and admits that he could not see through the very cheap and coarse and transparent trickery of Slade, which any man can do who has two hands, two feet, a limited audience of scientific non-experts, and a conscience sufficiently seared.

All the sciences of the world have passed through the stage in which the subject under discussion is now passing. We smile when a committee of editors, lawyers and clergymen are extemporaneously appointed to decide in public whether entranced mediums have or have not divine powers granted them in their trance state; but the time has been when the great questions of astronomy, of chemistry, of physics, and of medicine were settled, or supposed to be settled, in very much the same way. Sciences in their infancy are like our distant Western territories, where every one who chooses can squat down and stake out a claim.*

Observe that no new principles of evidence are introduced for application to this special subject. The first step in the development of all the sciences has always been the rejection of average human testimony. If we accept what people say, there can be no scientific knowledge of any kind. Non-expert human testimony is worth nearly as much on this subject as it is on any other branch of science; it is of little value anywhere, and intuitively and unconsciously all authorities on science reject it without examination, although they have not heretofore formulated this custom into a principle; for here, as in many other things, the intuition and unconscious reasoning has outstripped and been far in advance of our conscious reasoning. We have professed in theory, in books of logic and of law, that the senses are trustworthy, and that the concurrent testimony of large numbers of honest witnesses must be accepted as truth. In practice we have oftentimes cut

*The early history of Electro-physics in the last century excellently illustrates this fact.

away from these false dogmas. Already we are slowly recognizing through our intuitions, and must in time recognize through the reason, that all science is and must be the product of expert skill, and that the first qualification of a witness in court, or out of court is not honesty, but *competence to judge of the special matter in hand.*

In proportion as a science becomes developed into, and recognized as a specialty, through labors of experts in that branch, it is resigned to those experts, and outsiders do not presume to interfere. Illustrations by contrast are right at our very doors. The recent search for the suspected planet Vulcan was, by universal consent, resigned to astronomers, and no one thought of referring the question to committees of eminent and upright judges, or poets, or physicians; for it was assumed that in an investigation of that kind honesty, as such, counted for nothing; and that ability, even the highest scientific genius in other departments than astronomy, counted for nothing. But when Prof. Huxley, who is one of the few authorities of the world on biology, gave a series of lectures on evolution, which only a trained anatomist and geologist could begin to appreciate, not to say criticise, forthwith, the air is darkened with replies, and criticisms, and suggestions that almost any editor, or teacher, or professor, or clergyman feels competent to offer, with no suspicion of any special absurdity in such procedures. Why this contrast in the treatment which these two departments, astronomy and biology, receive? Partly because astronomy is an older science, has survived the attacks made upon it by theology, while biology is as yet hardly out of the territorial stage, where everybody has claims upon it, experts not having yet made it their exclusive property.*

* It may be alleged that Prof. Huxley took pains to formally attack an account of creation that belonged to a religion, and that in defense of their own belief, and from their own point of view, theologians, at least, were compelled to reply. Even allowing this privilege to theologians, it cannot be allowed to editors or critics in general; but the majority of theologians, it was observed, did not restrict themselves to the defense of the Mosaic account of creation, from the theological or philological stand-point, but brought positive criticism to bear either for or against Prof. Huxley on his own ground in paleontology, and thus by their rela-

The subject we are discussing is now in this state. Every eminent naturalist, or lawyer, or chemist feels that he can occupy it if he wishes, and that the world must respect his claims. They forget that the greatest blunders in history have been made by men eminent in special departments stepping outside of those departments, and that in all directions the truth of the aphorism of the famous magician Houdin, : "It is easier to dupe a clever man than a fool," is confirmed by all who successfully study these themes. The maxim for modern research should be, out of the mouth of two or three experts every word shall be established; and if they err, as they may, their conclusions are to be revised, not by the laity, but by other and better experts.

The very stupendousness of the claim here made, I may say in closing, may be a bar against its ready accep-

tions to this special subject, laid themselves open to the charge of being squatters in science. It is a wise rule for scientific men, in public discussions, to religiously avoid religion; and for the simple reason that the theological explanations of natural phenomena, all, or almost all, belong to the pre-exploratory stages of science, and only by coincidence can be expected to agree with the deductions of scientific experts, and therefore do not require either rejection or confirmation. The religious idea of creation has never been adopted as an hypothesis by scientific men, since biology and geology have been in what I here call the territorial stage; it belongs, rather, to the pre-exploratory stage, and being, not a matter of science, but rather of faith, it is not for biologists and geologists to argue for or against it.

The supernatural theory of trance, which has been more generally adopted than any other, I do not here attempt to elaborately disprove, for the same reason, that it belongs to the pre-exploratory stage of this branch of cerebro-physiology; and, unlike the animal magnetism theory, has never been adopted or seriously considered by the scientific men who have given their attention to this subject since it has been in the territorial stage.

If scientific men are persuaded that the beliefs of men are delusions, the better way to destroy them is by independently building up positive truths, which, if they are needed, and the world is ready for them, will be gradually accepted, and correspondingly the delusions must disappear. The antidote for darkness is light; as the day dawns night retreats. Those who understand and accept the theory of trance here unfolded, will dismiss forever the supernatural explanation of the phenomena, just as those who understand and accept the theories of astronomy, dismiss forever from their minds all supernatural associations connected with comets and meteors.

tance; but this objection is counter-balanced, in part at least, by the fact that by acting on these suggestions, it is possible for those who have adequate physiological knowledge and mental discipline, to study this whole subject for themselves, so that it shall not be necessary for them to depend on the dogmatic statements of any one.

Among a certain ancient people, it was the custom for any one proposing a new law to stand with a halter around his neck, so that if his proposition were displeasing to the people, they might hang him on the spot. If this custom were in force to-day, it is probable that the least possible mercy would be shown to the author of this paper; for it is not in harmony with the laws of human nature that views like these, that have only truth on their side, and all the world's past belief against them, shall find instant and secure lodgment. It therefore becomes necessary to appeal from the present to the not very far distant future, when a limited number of competent men shall have made themselves masters of and authorities in this branch of cerebro-physiology and pathology, and shall have learned, as they surely must, that it lies within the grasp of the properly trained and properly furnished intellect, that its problems are no longer unsolvable; that, in short, whatever mysteries have gathered around it in the past, exist no longer, but can be explained, and are explained in full detail, and that they can explain them.

As this rich and fertile field becomes occupied by those who alone are able to cultivate it, amateurs and laymen, and what I here call the squatters of science, will gradually retire, and the grotesque spectacle, but a few weeks ago presented at the British Association for the advancement of science, of a man reading, or attempting to read a paper on the phenomena of trance, not only without any knowledge of the subject, but without any conception of the means by which knowledge of this subject is to be acquired, or of the principles of evidence that apply to the acquisition of physiological science in general, will be remembered and cited only as a melancholy warning.*

* The above criticism applies as much to the critics of Prof. Barrett as to that gentleman himself; for in all that was said in the discussion that immediately followed the reading of his paper, and by the English press

The delusions that the darkness connected with this subject has sheltered, will die, are dying already; they would die even if they could not be scientifically explained, for witchcraft has been dead a hundred years, although to this moment its phenomena, though fully understood, have never yet been publicly and in detail elucidated. But as the delusions disappear, the facts of trance and of the involuntary life, which together constitute the real scientific substratum of delusions, will proportionately rise in dignity and in interest.

When the Egyptian architect, as you remember, erected by the royal command, a light-house on the shore of the Mediterranean, he placed, as he was directed to do, the name of the reigning king conspicuously on the top, but in perishable plaster, which soon crumbled and fell; and beneath, on the enduring marble, the future saw the name of the architect himself. So the delusions of which we have been speaking, which have attracted so much of the world's wonder, will disappear; but in their place, and out of the phenomena that gave them support will be recognized a positive addition to human knowledge, which, in time, must take its place side by side with other sciences, and become the common and permanent possession of mankind.

subsequently, the real fallacy in the procedure was, so far as I can learn, never suggested. The study of trance, which was practically the subject of Prof. Barrett's paper, is well worthy of the attention of the British Association; but only acknowledged authorities in cerebral physiology and pathology are competent to prepare, or should be suffered to read essays on that subject before any body that calls itself scientific.

Another evidence that this subject is yet far from the organized stage, is that when Mr. Crookes began his investigations in so-called spiritualism, the press urged him on, as though an eminent chemist and physicist were competent to deal with the mooted questions in physiology; and, to complete the absurdity, his reports of what he thought he saw were formally replied to by other chemists and physicists, on the doubly erroneous assumption that his experiments were rightly reported, and that any one outside of experts in that branch of physiology was competent to rightly estimate and reply to them. What Mr. Crookes and his associates did, or tried to do, with the medium, Home, will, in this world, never be known. Astronomy is the oldest of the sciences, but the number of those in the world who are capable of reporting correctly and authoritatively in regard to any alleged new discoveries in that branch, is very limited; and in the department under consideration, to which we are but just

beginning to give serious and successful attention, it may be doubted whether there can be found in Europe and in America combined, a dozen individuals sufficiently expert to report with any approximation to accuracy, what transpires in experiments of this kind.

Mr. Crookes is certainly one of the most ingenious and careful of experimentalists in chemistry and physics, and fully deserves his great and increasing fame; but his experiments in chemistry and physics, even those that are original and refined, are simple matters in comparison with physiological experiments with living human beings. Assuming for the moment the substantial correctness of Mr. Crookes' report of some of the superficial facts relating to what was done in the presence of himself and Mr. Huggins, it is clear that of the six sources of error that enter into all experiments of this kind, and all of which must be absolutely guarded against if the experiments are to have any scientific value, not one was even thought of. For a physicist, or even for a physiologist to try to explain such reports of such experiments, is to be guilty of a blunder but one degree below that of the non-experts who originally made the experiments; is, indeed, to beg the whole question at issue. The position of Mr. Crookes and of Mr. Wallace, and Sergeant Cox, in relation to this matter, is not at all peculiar or unprecedented; the stream of superstition through all the civilized ages, is lined, on either side, with the battered reputations of great and good men.

A scientific gentleman of distinction once remarked to me, that he could only explain the statements of Mr. Crookes on the hypothesis of positive dishonesty. This hypothesis is at once unjust, unnecessary, and unscientific; for in science everywhere, simple non-expertness makes more blunders than the most atrocious dishonesty. A friend of mine, a physician of unusual ability and acquisition, whose conversation is always of great value to me—an observer of far more than average acuteness and originality—is unable to attend any performances where strange or supernatural events are claimed or expected, although a skeptic in such matters, without at once becoming entranced; and the accounts he gives of what he thinks he sees and hears in such places, are as amusing to himself as to others. It cannot be too often repeated, line upon line, and precept upon precept, that in science the prime requisite is not honesty, nor general ability, nor skepticism, nor genius even in other departments, but expert skill; that being absent, all else is as sounding brass and a tinkling cymbal.

