NEUROLOGICAL

Lectures and Addresses.

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ADDRESS IN MENTAL DISORDERS.

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When primeval man by means of his split flints had so subdued the opposing forces of nature that he had leisure to things other than the immediate supplying of his wants, his attention was, no doubt, most painfully arrested by the torments of sickness. In that hour was born that science, which in the lapse of ages has developed, until now it constitutes the vast mass of discovered fact, established deduction and bold speculation which we know as the science of medicine. At first, the outward manifestations which were called symptoms attracted the observer. Ages probably passed by before these symptoms were in the consciousness of the race associated into well-defined groups. Then the underlying causes began to be sought out. Morbid processes were investigated, and so step by step the study progressed until at present, pathology has so far been perfected that most disease-processes are understood, and when we speak of typhoid fever or any other equally well-known affection we refer not to a group of symptoms but to a definite disease-process. In mental medicine the pathological problems are so recondite that hitherto they have in great part baffled investigation; it is indeed an open question how far we shall ever be able to apprehend the minute structural changes which are connected with morbid mental action; there are problems in the settlement of which our finest microscopes are mere blundering, useless tools. To our utmost study the human spermatozoa are nothing but irregular, transparent specks of protoplasm not to be distinguished one from the other. Yet the records of past generations are written in those formless particles, and in them also are enfolded the potentialities of future successions of men. From one shall come forth a demon, from the other a saviour of the race. Who shall solve the riddle of their construction? Helpless and hopeless are we. Almost hopeless is it that we shall ever understand the infinitely delicate changes which take place in the complex protoplasm of nerve cells, and be able to see the waves of emotional and mental excitement or paralysis which sweep over the individual, or to recognize the alterations in nervous protoplasm gone mad. Or our so-called mental diseases are simple groups of symptoms, which may, for aught we know, in different cases arise from essentially different pathological processes. In one individual suffering from paralytic dementia the depression of melancholy clouds the life, whilst another man with apparently the same brain lesion revels in the wild exaltation of the mania of grandeur.

For the purposes of discussion, we must, at the present stage of our knowledge of insanity, give names to certain symptom-groups, but for the purpose of clear thinking it is essential for us to remember that these symptom-groups are not diseases, but associated symptoms which may in different cases depend on essentially different causes. Is a melancholia which is produced by impacted fæces and relieved almost at once by the clearing out of the rectum (*American*

Journ. of Insanity, XLII, p. 264), the same disease as a melancholia depending upon hidden and irremovable causes in the nerve centres? It is odd that alienists of wide culture and ability have hot disagreements in regard to the diagnosis of a case. Thus in a review of Professor Seguin's Opera Minora, Dr. Kiernan, of Chicago, exclaims of a case reported by Seguin as a maniac, "whatever the psychosis might have been it certainly was not mania." If mania were a distinct disease it is hardly likely that a neurologist of the experience and culture of Dr. Seguin would not be able to recognize it. If mania be not a distinct disease, but a mere set of symptoms, surely the vehement assertion made by Kiernan is little less than an absurdity. The truth is that the thought of modern alienology is pervaded by the fallacy that our symptom-groups are diseases.

Symptomatology in any department of medicine is a study of the first importance, but in mental medicine it at present almost bounds our horizon. To the study of this symptomatology men are urged not only by the needs of the insane but also by the necessities of the sane.

If there be one thought more than another which ought not to be forgotten, it is that the human mind diseased is the human mind still. The coming on of insanity marks not the appearance of a new entity or a new force. The old entity or the old force simply goes astray. It is the failure to grasp this clearly which has lead many a lawyer to say to the expert; "You crazy doctors believe that everybody is insane," and has occasionally betrayed the unwary alienist into acknowledging that this assertion is true. I say distinctly that it is not true. Sanity is the condition of the great bulk of mankind, but the impulse, the mood, the failure of judgment, the lack of coherent thought—the various symptoms which constitute the chaos of disturbed intellection find their counterparts, or rather their germs, in every healthy mind. So long as these impulses, moods, etc., can be dominated by the will of the individual, just so long are they simply the weaknesses of humanity; but when the will of the individual is powerless before them, then is that individual insane. The passage from one state to the other may be so gradual that only to omniscience is it possible to say when the line between sanity and insanity, responsibility and irresponsibility is crossed.

Insanity so terribly affects the relations of men that it very frequently is the centre of the legal battles whose arena is our courts. Not rarely the keenest and most thoroughly trained intellect is baffled in attempting to decide how far responsibility should attach to the alleged criminal, or how far the original will of the individual has entered into the instrument which purports to be his last will and testament. When this is remembered, how utterly absurd appears to be our system for deciding the mental condition—a system which we have inherited from the times of oppression and of violence. Twelve men, perchance honest, of a certainty, many of them uneducated and probably all of them ignorant even of the ordinary principles of medicine or of mental action; one judge, learned in the law, and bound in the iron hoops of legal prejudice and legal methods of thought, unacquainted with the science of medicine, and may-

hap with the laws of mental action ; two lawyers, sharp, trained in every device for brow-beating and baffling witnesses and in every crafty method of hiding the truth and of misleading the ignorant, contending one with the other ; experts, chosen without guarantee of their knowledge of the subject, hired by one side or the other, possibly dishonest, certainly liable to have their view of the case affected by the glass through which they have looked at it. This is the machinery which in theory is to per petuate justice, but which in truth in a large proportion, if not the majority of cases, works out the wrong. With such a system and such a method is it a wonder that the decisions of our courts in questions of insanity are a laughing stock among those who know? Is it a wonder that the sane man is so often judged insane, while the lunatic almost as often has the stamp of sanity put upon his untoward acts?

Is it a wonder that those who have seen much of this so-called justice grow cynical and look upon legal procedures as farces which, alas, but too often end in tragedies? Not many years since two lawyers of eminence came into my office and laid a certain case before me, desiring that I should go upon the stand and declare that their client was sane. After listening to their statements, I said, "This man is absolutely insane, and you cannot find on the two continents an individual who is at once honest and capable who will not give you an opinion similar to mine. There is no room for doubt in the case. If, however, you want to win, all that you must do is to call in no experts, declare that you do so because doctors and experts are fools ; browbeat and confuse, as much as lies in your power, the expert witnesses on the other side and then appeal to the jury that this American citizen shall not be deprived of the rights for which the immortal Washington, Adams, and Jefferson contended, and for which heroes innumerable have fought and died." They took my advice. The witnesses were confused, the jury was dazzled by the eloquent appeals. The judge made a charge which the newspapers of the day lauded to the skies, but which seemed to me veritable foolishness, and the man was declared sane. Shortly afterwards, in the wreck of his intellectual power, he had still sense enough to perceive that in order to protect himself from himself the restraints of an insane asylum were essential, and I believe that he is still a voluntary inmate of such an institution.

To the truculent barons that gathered around King John at Runnymede, personal liberty seemed the one point for whose preservation all law should exist. But times, although not laws, have changed, and to day the danger to the State is not that personal liberty shall be restrained, but that it shall degenerate into license. The spirit of the barons still lives in our legislation and in our public opinion in regard to insanity. Pamphlets, newspapers, lunacy commission reports, all portray the hardships of depriving the lunatic of his freedom and men grow eloeuent concerning the danger lest sane men shall be shut up in asylums. The medical profession seems to be in the eyes of the public an avaricious monster lending itself for gold to any nefarious design. Laws have for their basis the idea that men and women are for criminal purposes

habitnally incarcerated in asylums. The fear of this is, however, to my thinking but a survival of mediæval feelings and mediæval possibilities. It is now nearly twenty years since I began to study insanity as a specialty, and I have never yet known a case in which a person was improperly placed in an asylum, though I have known cases in which persons whom I believe to be lnnatics have been set free by lunacy commisions. More than this, I have had personal knowledge of almost every kind of prejudice as the result of the failure of the law to give protection *from* the lunatic. I have kuown the prisoner whose craziness should have been recognized, allowed in his cell weapon and opportunity for dashing out without cause the brains of an unsuspecting keeper—an almost raving lunatic suffered to pour sulphuric acid upon his victim—a mother permitted to cut the throat of her own offspring and to die by her own hand; a father scarcely stopped by neighbors in time to prevent the final completion of rape upon his daughter—another father allowed to blow out the brains of the helpless little child kneeling before him in an agony of prayer for life. I might extend the catalogue, but I forbear, Waste of property, dishonor, death by murder and suicide—these constitute a long line of perpetually repeated tragedies which might and which ought to have been prevented by early recognition of the mental condition and sequestration of the insane criminal. On the one side the lunatic himself and his insane victims call aloud for protection from the wild, beast-like fury of the maddened brain. On the other is the bug-bear of personal freedom. Let, however, a crime be committed, and here, at least in Pennsylvania, that law which has made protection so difficult cries for blood, although punishment has very little deterring effect upon the insane, and the only protection which is afforded to the community by hanging the insane murderer is a protection from his individual acts. A dead lunatic is certainly a harmless lunatic. The Pennsylvania law is wise in that it does give the judge the right to perpetually incarcerate the lunatic who has once been acquitted on account of his lunacy. But the general workings of the modern law is shown in the case of B. recorded in a recent number of the *American Journal of Insanity*. This man was a moral imbecile driven by a furious impulse to torture and kill, whose greatest pleasure was to tie up horses in the woods and gradually whittle them to death, to mutilate living cats, torture chickens, break the legs and tear to pieces, whilst living, small birds, and who, when opportunity offered, reached the very heaven of his joy by assaulting, torturing, killing human beings. When twelve years old he took his toddling brother into the woods and nearly flogged him to death. He attempted to strangle a younger brother and to smother his infant sister; had stabbed various people, essayed to suffocate a harmless imbecile and to choke another inmate of the asylum, and committed at least two criminal assaults on women, the last during an escape from the asylum. Tried for this last offense in spite of the efforts of alienists, the patient was convicted and condemned to six months' imprisonment. His conviction of course was tantamount to a legal declaration of sanity, and the judge in sentencing the prisoner told him that at the end of

the three months he would be a free man.

The problems growing out of the relation of insanity to crime are exceedingly difficult, and I do not propose to-day to say more about them except to express my conviction that the present system of trial would be improved by the presence of an alienist upon the bench as an associate judge, or by the reference of the question of insanity in criminal, as well as in civil cases, to a commission, whose report might probably be subject to review by the judge.

Possibly the public opinion which at present demands the hanging of insane people is not so far wrong as some of us think, but certainly there can be no question as to the evils which have resulted from the systems of civil insane commissions. As proof of this I shall cite two recent cases which I believe have not been before published, and in which I have been personally concerned. The first case is that of Dr. Martin Weaver, an elderly gentleman living at Germantown. The petition asking that Dr. Martin Weaver, should be declared a lunatic was filed by his nephew, but the circumstances were such that the pecuniary interests of his daughter, Miss Weaver, were chiefly involved in the declaration that her father was a lunatic.

Twelve witnesses in all, including the party who served the notices were examined on behalf of the petitioner, and but two or three of these witnesses testified to any knowledge of the alleged lunatic during the three years preceding the inquisition. On the other hand, twenty-two witnesses testified in the most positive manner as to the sanity of Dr. Martin Weaver covering a period from his boyhood to his present advanced age of eighty-one years. The following well-known physicians affirmed without qualification the undoubted mental capacity of Dr. Weaver, after they had made a personal examination of him : Dr. D. Hayes Agnew, Dr. Thomas G. Morton, Dr. John B. Chapin of the Pennsylvania Hospital for the Insane, Dr. John C. Hall of the Friend's Insane Asylum, Dr. Henry M. Wetherill of the Pennsylvania Hospital for the Insane, Dr. Charles K. Mills, and Dr. J. R. Landis, the family physician of Dr. Martin Weaver for the past six consecutive years. Further, no less than eight well-known lawyers testified from personal knowledge as to the entire ability of Dr. Martin Weaver and his capacity to manage his own business. Not a single physician or expert on insanity was called to testify that Dr. Martin Weaver was insane. Nevertheless, the jury decided Dr. Martin Weaver to be insane in the face of the strongest protest from the commissioner, who was acting as judge in the case. The court of common pleas after hearing the whole case, set aside the report of the jury as contrary to the evidence, but when the matter was carried to the Supreme Court of Pennsylvania, it was then decided that the common pleas court had not the power to set aside the verdict, which still stands. I have myself, in two long interviews, studied the mental condition of Dr. Weaver, and although he is *de jure* a lunatic, he is *de facto* sane.

Living near by to Dr. Martin Weaver was an adult imbecile man, whose father died after a long period of chronic lunacy. Miss Bessie Weaver, the same woman who was involved in the previous suit, was married to this young man in the city of Camden, and suit was afterwards brought in order to have

the marriage set aside on the plea of the imbecility of the man, who was afterwards examined by Dr. Chase, of the Norristown Asylum, and myself, and we pronounced him without hesitation an imbecile of a low grade. Without going into the details of our examination, it suffices for the present to state that I questioned him to discover whether the marriage had been consummated or not, but did not succeed in making him clearly understand what I meant, although I judge that there had been no consummation of the marriage. Although he had been sent to school until he was twenty-two or twenty-three years of age, he was unable to give change for a dollar without counting on his fingers, and in no way could he completely give the change for a two dollar bill. He was without doubt a harmless, docile imbecile, yielding like putty to any one that he would come in contact with, yet the jury was divided, about half of them declaring that he was able not only to take care of himself, but his inherited estates, which amounted to some hundreds of thousands of dollars. In the absence of any agreement he remained in the eyes of the law sane, and I am informed that this case was settled by the payment of a large sum to Miss Weaver never to come near the imbecile. I understand Miss W. has a very high opinion of our legal methods.

The law of Pennsylvania provides two methods of declaring a patient insane by civil process. Thus one act requires that on statement in writing of any respectable person that a certain person is insane, and that the welfare of himself or of others requires his restraint, it shall be the duty of the judge to appoint immediately a commission which shall inquire into and report the facts of the case. This commission shall be composed of three persons, one of whom at least shall be a physician, and another a lawyer. In their inquisition they shall hear such evidence as may touch the merits of the case, as well as the party complained of or his counsel. If in their opinion it is a suitable case for conviction the judge shall issue his warrant for such disposition of the insane person as will secure the object of the measure. According to the second act, upon the application in writing of a relation by blood or marriage, or of a person interested in the estate, a commission empowering one or more persons as commissioners may be issued by the court of common pleas by virtue of which the sheriff is required to summon such number of persons, not less than six nor more than twelve upon this inquest, as the circumstances of the case may seem to them to require. When this inquisition after examination has declared the person a lunatic the aggrieved person may traverse the decision, provided such traverse be fulfilled within three months after the declaration of the inquisition. The power of traverse consists of a trial before a jury in the court of common pleas to determine whether the mind of the alleged lunatic be deranged to such an extent as to disqualify him from conducting himself with perfect safety to himself and others, disposing his own affairs and discharging his relative duty.

It so happens that I have never seen practiced the method of declaring a person insane by means of a commission of three persons as directed by the act here first spoken of, and its use must be very rare; the second plan being almost universally pursued probably because the law directly affirms that under

it the estates as well as the person of the insane man pass into the hands of the trustees. This second method is practically a jury trial and possesses all the inherent faults of such a trial. It is hardly necessary to recall attention to these faults. They may be summed up as existing in the expensiveness of the method, and the absolute impossibility of obtaining just decisions in regard to intricate scientific questions, amid the ignorance and prejudice of twelve men drawn almost invariably from the lower walks of life and under the influence of trained minds trying to mislead. "Of course he ought to be confined in the asylum," says the lawyer with a sneer, he pays them forty dollars a week, and the opinion of the juryman sets as plaster-of-Paris sets in the mould of the sculptor.

All the legislation that would be required to make the laws of Pennsylvania in regard to the civil side of insanity worthy of some respect, would be to abolish the second method of declaring people insane, and to require that the decision should be allowed to rest with a commission consisting of three persons, one of whom shall be a lawyer, one a doctor, and one a general man of business. I believe myself that the decision of such a commission should be finally subject only to review by a bench of judges who, under restrictions, with which it is not necessary to here occupy time in discussion, should have the power to overrule it. In insanity cases I would do away entirely with the *habeas corpus* and its accompanying jury trial. Owing, however, to its close connection with political liberties in the past, the jury is still a fetich, which is worshipped probably by the bulk of the legal profession and the majority of the American public. It remains, however, a feudal relic utterly unsuited for many of the emergencies and complex relations of modern life. There is even a widespread belief that the man has a constitutional right to a jury trial. It is hardly necessary to say that this is not correct, that the constitution simply guarantees that the man shall not be deprived of his liberties without due process of law. What this process of law shall be is left to the legislature.

Perhaps, however, I am all wrong in thinking that the term administration of justice, applied to the process of the law, ought to be considered anything more than an euphemism. Wiser, no doubt, was the dictum of a very famous lawyer which I heard publicly quoted by Mr. George Biddle with approval. According to this dictum the law does not exist for the purpose of preventing men from cutting one anothers throats. That in regard to insanity, law in America is not always successful, even in the latter aspect, is shown by a case of which I have cognizance, in which a jury acquitted a man of homicide on the ground of instantaneous irresistible impulse, although the murderer had armed himself, and traveled nearly one hundred miles with the apparent intention of killing his wife's paramour. This case is only one of many that might be cited as an illustration of the fact that the results of a jury trial depend much more upon the sympathies of the jury than upon the justice of the cause.

I insist that not only for the purpose of justice, but for the purpose of control, the Pennsylvania law in regard to insanity still needs modification, a

modification which to my thinking ought to be easy of accomplishment, because it would consist chiefly in the abrogation of an old law, which in spirit is discordant with the recent act. Let at least in all civil cases the question of sanity or insanity of an individual be decided by a properly constituted commission, and it may happen in coming decades that justice shall invade even the province of the criminal law. Is it not fitting for this association to move in this matter, and would it not be well to appoint a committee who should have power to represent this body? I therefore offer this resolution:

Be it resolved that the President be directed to appoint a committee of —— members who shall confer with the State Committee of Lunacy, and if in the concurrent opinion of the committee changes are advisable in our laws relating to lunacy, shall have power to represent this body in obtaining such legislation.

THOUGHTS CONCERNING THE SYMPTOMATOLOGY OF INSANITY.

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In an address which I had the honor to make last June before the State Medical Society of Pennsylvania upon the subject of Insanity, I considered in some detail the following points: First, that the so-called different insanities are not diseases, but groups of symptoms. Second, that insanity is a condition which is developed out of sanity, often gradually, and that all the symptoms of insanity exist in embryo in the sane mind. Third, the difficulty in many cases as to deciding in regard to the sanity or insanity of the individual and the absolute uncertainty of our ordinary legal methods of procedure. It has occurred to me that possibly some further illustrations of the above thoughts, or rather some considerations growing out of the above thoughts might not be lacking in interest to the readers of this magazine.

One great difficulty in obtaining proper laws in regard to insanity, is the ignorance and prejudice and consequent incorrect thinking of the legal profession and of the general public upon the subject. In this country public opinion is all powerful and in the final event everything must yield to it. In matters like insanity, the opinion of the laity is slowly affected by knowledge which filters down through the medical profession. Am I wrong in thinking that the profession itself has been somewhat at fault in this matter? The compressed course studies which is all the American student, in the absence of much needed legislation, will tolerate, affords

no time for instruction in mental medicine. Cases of insanity as they arise are almost of necessity referred to the specialist, and so it comes to pass that the general medical practitioner often is little acquainted with the minute details or even the general principles of the subject. But it is the general practitioner to whom the family first appeals in cases of mental disease as well as of physical sickness, and not only may the health of the unfortunate victim of mental disease be imperilled, but even the lives of those about him may be brought into danger through the failure of the physician to understand the first mutterings of the coming tempest. Possibly, therefore, it is excusable if I here call attention to certain symptoms of insanity and to certain relations between mental power and mental integrity, in remarks which may seem to some trite.

The various manifestations of abnormal mental action may be grouped under two heads. First, emotional; second, intellectual aberrations. The study of the normal life of man seems to me sufficient to convince any one that it is possible for a disordered condition of the emotions to exist, which shall completely overpower the individual and lead him to commit acts, the wrong of which is intellectually recognized by him, but which his will is powerless to prevent. The drift of modern science is to show that there is in the brain a more or less complete differentiation of function, and it is most probable that one set of nerve cells is connected with emotion, and another set with intellectual thought, so that the excitation of one set of cells produces an explosion of nerve force taking the form which we know as anger, and the excitation of another set of cells causes a paroxysm of fear or love, whilst the result of the action of still another set of cells is the development of ideas. If an influence so affects the intellectual cells of the brain to-day as to pervert their function, intellectual insanity results. To-morrow, the same influence transferred to the emotional cells may cause an emotional insanity. The correctness of this *a priori* reasoning is most abundantly confirmed by the facts of every day life. When Jarndyce built the Growlery, into which he could retreat as soon as the cold wind from the North Sea turned sour in his bosom the milk of human kindness, he gave substantial recognition to the fact that the weather acts upon our nervous systems, and through our nervous systems upon our thoughts. The method in which this impression is made is very mysterious, but that the impression is made is undeniable. We are all familiar with the researches of the West Point professor of physics, who had the misfortune to lose an arm during the rebellion, and subsequently to suffer from neuralgia of the stump. Every north-east storm produced a paroxysm of pain; the electrical conditions, the amount of moisture, forces and directions of the wind, the percentage of ozone, all the known characteristics of the storm disturbance were studied by this learned physicist, but no relation could be made out between them and the pain. It was, however, distinctly proven that the period of maximum pain or the pain centre travelled regularly about twenty-four hours in front of the storm centre, so that it was possible for a circular storm to sweep past and involve the neuralgic victim in its pain circuit, without any apparent disturbance of the weather.

The same mysterious atmospheric influence which in one individual produces sensory disturbance which we call pain, causes in a differently constituted person an emotional disturbance which we call depression of spirits. By no direct effort of the will can the individual stop the pain, no more by a direct effort of the will can he stop the nervous depression. If the pain be not too severe by appropriate measures he can alleviate it, and if the depression be not too deep, by appropriate measures he can relieve it also, but when the conditions are too unfavorable it is not possible to prevent the nerve storm. All that the will of the individual can do is to rise superior to the pain or to the depression.

Emotional depression deepens into the profoundest melancholia by a gradation as insensible as that by which the most perfect beach slopes into the deep ocean, and who shall say where the waves beat up over the individual's power of control? Where is the dividing line between the state in which the man is master of the mood and that in which the mood is master of the man? At such point, wherever it be, lies the line between sanity and insanity, between responsibility and irresponsibility.

In cases of intense moodiness, as in other instances in which the line of insanity is being approached, the position of physician may be one of serious embarrassment. In severe depression there is always some danger of suicide, although the intellectual faculties of the patient may not be at all unhinged. If suicide or homicide under these circumstances be committed, we have in the act reasonable proof that the mood has triumphed over the intellect, and that therefore the patient has become insane. It may well happen, however, that this momentary insanity should take the form of a sudden impulse; the position of the patient being comparable to that of a person on the seashore in water reaching to the neck, when the sudden wave goes over the head and momentarily engulfs the individual. It is the duty of the physician in all these cases, carefully to warn the friends of the patient, and even when this is done, occasionally a suicide or homicide will be committed, which could have been prevented by the previous sequestration of the individual. When the delusions of persecution manifest themselves in a melancholic patient, even though these delusions be imperfect and temporary, now appearing and now disappearing, the situation is a very grave one, and the physician who does not advise the placing of the patient in such positions as to be perpetually watched, incurs the gravest responsibility.

A very curious attribute of humanity which has enormous effect upon human action, is the influence which is exerted by the surroundings of a man upon his personality. Sudden *impulse* may be produced by external circumstances. A very common example is the impulse, which bids a man, standing on the verge of some great height, jump headlong—an impulse which is undoubtedly occasionally obeyed and has produced not a few unpremeditated suicides. I suppose my own experience is not different from the common. Sometimes standing on the platform of a station, seeing the great light of the locomotive mysteriously moving down upon me through the darkness, only by a

distinct effort of the will have I been able to restrain myself from throwing myself under its wheels. This sudden impulsive motive is not confined to the human race. Any one who has ever hunted deer by the fire-jack in the night, must have witnessed or known of the animal being drawn to his own destruction by the mysterious influence of the brilliant light shining out of the darkness. If it be said that this is mere curiosity on the part of the deer, such explanation is not to be found in the throes of the bird, charmed by the basilisk eyes of the black snake, violently fluttering against its own will into the open jaws of destruction. Of similar character is the influence which spreads from person to person, uniting masses in one common impulse—an influence to which the name of sympathy has been given, but which is evidently of the same nature as that which bids a man throw himself headlong from the height. The orator knows full well the power of this impulse and how, when the audience is scattered over a large room, the finest flights of eloquence fall without effect, but when man stands close to man, an apparently causeless power seems to gather itself and spread from bench to bench. It is this reverberating power of impulse which constitutes at once the weakness and danger of a mob. Let the heart of one be filled with rage, it overflows and spreads until men and women alike become full of the reckless cruelty of the wild beast, but if the panic comes into the breast of one, it too spreads with force and the mob melts, it may be before the steady discipline of a few policemen.

There are undoubtedly certain morbid conditions of the human nervous system, in which the slightest external circumstance provokes overpowering impulses or in which, indeed, these impulses seem to be purely subjective and arise spontaneously within the individual. As an instance of an apparently purely subjective impulse, I may cite the case of a man long under my care, with a distinct history of hereditary insanity, but in whom the only evidence of mental unsoundness I could find, was an impulse to assault by-standers. Once, upon returning home, I found this man sitting in my office with pale face, haggard eyes and every expression of great excitement. He greeted me with, "Doctor, Doctor, I nearly did it! I nearly did it!" It appeared that he had spent forty-eight hours without intermission in a vortex of excitement, and suddenly the impulse to kill had come on with such power, that only by fleeing to my office was he able to save himself.

That the impulse which seems to originate spontaneously in the nervous system, often, if not always, is awakened by some external suggestion, is illustrated by the case of a moral imbecile, reported in the *American Journal of Insanity*, who was dominated by a furious impulse to torture and kill, whose greatest pleasure was to tie up horses in the woods and gradually whittle them to death, to mutilate living cats, torture chickens, break the legs and tear to pieces whilst living, small birds, and who, when opportunity offered, reached the very heaven of his joy by assaulting, torturing and killing human beings: when twelve years old, he took his toddling brother into the woods and nearly flogged him to death: he attempted to strangle a younger brother and to smother his infant sister, stabbed various people, essayed to suffocate a harm-

less imbecile and to choke another inmate of the asylum, and committed at least two criminal assaults on women.

Mr. B. sometimes passed through weeks and months of good behavior, but at any time the sight of blood would arouse the sleeping devil in him, he would become extremely pale and agitated, although seemingly quiet and listless, but unless closely watched, would in the next few hours, gratify his lust for torture and death. That the gratification of the impulse gave him pleasure is certain; thus, once when surprised just after he had cut a cat's throat with a piece of barrel hoop and was covered with blood, he appeared to be in an ecstacy of happiness, although very pale and weak. In some cases, the carrying out of the impulse gives to the doer pain rather than pleasure, although he is powerless to control his act. Thus, a gentleman whose life was ruined by impulses to do bizarre actions, said to me, "Doctor, the sensation is precisely like that when I try to hold my breath, just as in such case, the time comes when my will must yield to the impulse to breathe, so must I do these odd actions, which my nervous system demands."

In those cases in which there are habitually powerful impulses without other indication of mental unsoundness, the physician who is consulted is placed in an embarrassing position. He may believe that there is the gravest danger of a crime being committed, but he cannot give a certificate of insanity. So long as the impulses are controlled in the patient, the latter is not insane, but so soon as the impulses control the patient he is insane: the danger is that insanity and the crime may be simultaneous. In such cases it seems to me that the first duty of the physician is, if possible, to persuade the person affected, either to put himself as a voluntary patient in some retreat, or to take himself out absolutely away from his present surroundings into circumstances which will not call forth the impulses, and which will guard him against the effects of these impulses, if they become overpowering. Especially in such cases, is it the physician's duty to warn the friends of the patient of the situation. When, as in my own practice, the patient has come simply to the office, perchance given a false name and carefully hidden his immediate connections from the consultant, a plain unvarnished statement of the case to the patient himself, is about all that the physician can do, and it ought to relieve him from moral and legal responsibility.

So far as the medico-legal relations of over-powering impulses are concerned, we must recognize that at this point, science has outstripped the possibilities of practical legislation. Whether courts will allow it or not, it is certainly a fact that these impulses do arise, are uncontrollable by the individual, are a form of insanity and do relieve from moral responsibility. I am not myself at all sure, however, that the law ought to recognize the doctrine of instantaneous impulse. To allow such doctrine to have weight in a court room, would be to afford a shelter to every criminal, and it is perhaps better that an insane man occasionally be hung, than that murder be protected.

The symptom which is usually considered to be absolutely pathognomonic of

insanity, is that which is known by the name of *delusions*. By Spitzka insane delusion is defined as a false belief, out of which the subject cannot be reasoned by adequate methods for the time being. It is evident, however, that this definition is too wide, as there are perfectly sane persons who hold faulty or false beliefs, out of which they cannot be reasoned. Thus, either the Christian or the Mussulman under such a definition is a victim of an insane delusion. To meet the necessities of the case, the definition must be so modified as to read "A faulty belief concerning a subject capable of physical demonstration, out of which the person cannot be reasoned." It is important to remember too, that an idea or belief may be true, and yet may be insanely held and be in fact a delusion. As the prescribed limits of this article are too restricted for the development of this thought, I must refer any one interested to page 428 of my book on "Nervous Diseases." Suffice it for the present to call attention to the fact that the essential thing in the delusion is not the falsity or the truth of the belief, but the condition of the mind, which holds the delusion *i. e.*, a condition in which the mind is incapable of receiving, weighing and acquiescing in evidence.

To discuss all the important features of insane delusions, would carry me far beyond the proper limits of the present article, but there are some points to which I would briefly call attention. A delusion may develope suddenly, but often it grows gradually. At first it is a thought, then a suspicion, then a conviction and finally a delusion so firmly fixed that nothing can loosen its hold upon the mind of the now insane man. As illustrating this, I may mention a case which I met with at my clinic at the University Hospital. A man, after malarial fever, began to have suspicions in regard to the chastity of his wife. For a time he kept these to himself, but finally, he accused her of infidelity. After this had continued for some weeks, he presented himself with his wife at my clinic, saying to me, "I think my wife goes with other men. She thinks I am crazy, and we have agreed to leave the question to you." Five minutes conversation demonstrated that the belief was a partially crystallized delusion, and when his case was carefully explained to him, with a voice of authority, he said he now understood it, and was glad to hear it, and that it gave him power to brace himself against the delusion, ending with the assertion that he believed "he had a good woman."

As the delusion comes, so it may go. I have seen an absolute fixed delusion, which had been held with unwavering faith for fifteen years, disappear in a night, and I have in other cases, traced the gradual weakening of the delusion as it slipped day by day from its hold upon the mind. Some very able alienists attach much importance in the classification of disease, as to whether a delusion is systematized or unsystematised; a systematized delusion being one which the patient defends by reasoning, an unsystematized delusion, one which the patient simply holds without defence. If, for instance, Mr. Jones affirms that he knows his soul is lost, because upon a certain day he committed the unpardonable sin and because the birds say there is such a sin, which is the particular one he did, then Mr. Jones has a thoroughly systematized delusion. If, how-

ever, Mr. A. simply says that his soul is lost, never attempting to defend it logically or give reasons for it, then he has an unsystematized delusion. As is very frequently the case in medicine, this distinction which in the black and white of print appears so clear and readily recognized, is, when invested with flesh and blood, as impalpable as the ghost of Hamlet. There can be no doubt that certain individuals have delusions, which they reason about to the fullest extent, and which are, therefore, thoroughly systematized, and also, that other patients suffer from absolutely unsystematized delusions; but I must insist that every grade is to be found in nature, between the most thoroughly systematized and the most thoroughly unsystematized delusion, and that any separating of diseases founded upon the difference between systematic and unsystematic delusions is artificial; justified only by the fact that the classification of insanity in our present state of knowledge must be symptomatological, and therefore artificial.

In the completely systematized delusion, the patient not only reasons from his delusion, but reasons in defence of it. A common form of partially systematized delusion, is one in which the patient reasons from his delusion, but does not reason in defence of it. As illustrating this, I may mention a case of a gentleman, whom I visited at one of our insane asylums along with a relative who was a little careless in his dress. The delusion of the patient was, that every person has his double who could not be distinguished from the man himself. This delusion he did not defend, merely asserting the existence of doubles as a fact, but he continually reasoned from it and about it. He said to the relative, "Are you Mr.———— or are you his double?" The relative asserted that he was the insane man's brother-in-law, and gave an account of certain events which happened when the two were camping alone in the wilderness, evidently much to the surprise of the insane man who finally said, "You look like my brother-in-law, you know things that nobody but my brother-in-law knows, but—no, no, you are not my brother-in-law, because," taking hold of the brother-in-law's somewhat ragged vest, "my brother-in-law never wore a vest like that, you must be his double." It has been said that those cases which appear to be half way between the unsystematized and systematized delusion are only apparently so, and that the individual reasons very feebly or not at all concerning the delusion, simply because in health his reasoning faculties are very feeble. I cannot, however, acknowledge that this is the case. The uneducated person of little logical endowment, when defending the systematized delusion, undoubtedly defends it with less skill and tenacity than does he who has been an educated logician, but this does not explain the gradations between systematized and unsystematized delusions to be met with in almost any large insane asylum.

To attempt to describe the various forms and varieties of delusion, would be to essay a treatise, but it seems right to say a word here in regard to one class of delusions, especially since such delusions are frequently present, when the general mental powers of the individual are still well preserved, and when it may be impossible to convince a court or jury that the subject is insane.

although in truth, he is not only a lunatic, but also a dangerous one. I refer to the so called delusions of persecution; delusional conditions in which the subject believes that he is made the object of persecution. Voices of reproach, or of hatred, or of derision are heard by him in the night watches as well as in the day time, conspiracies are formed against his person or his good name, bystanders are seeking to do him harm, spirits are oppressing him, and so in a multitude of forms the unfortunate man is, in his own belief, a victim of the hate, the ill will, or the envy of others. The danger in these cases is that the sense of persecution may lead a person to the refuge of suicide, or more frequently to counterplotting or to assaults. He who hears voices in the air may revenge himself upon those who happen to be near him and whom he believes to be the source of those voices. She who is bewitched may, as did a woman not long since, arm herself and travel half across the continent to take the life of a doctor with whom she had had no intercourse for years, but whom she believed was projecting evil spirits upon her. He who believes that his manhood is being taken away may, as did an unfortunate prisoner, beat out the brains of the man whom he believes is conspiring to his ruin: or as in three cases which I have seen this spring, serious injury may result from untoward attempts at escape. Thus a man coming from Mauch Chunk, where he had done a day's work, thought that he saw three men looking at him and talking at him, leaped from the car and was crippled. Another gentleman, an Episcopal clergyman of good standing, jumped from an express train to avoid a fancied assault and broke his knee cap. A third man, going from Boston, watching everybody and believing that the voices are everywhere about him, notices four men playing at cards, and as one slaps down his card and cries violently, "Hit him hard, I have got him," sees in his disordered vision a pistol drawn, leaps in terror from the cars and ever after shows his elbow, shattered by the fall, as proof that he had no delusion, but was shot. Probably in not one of these cases would it have been possible to have convinced a jury that the man was really insane before he made the fatal jump. Of all forms of insanity without distinct homicidal impulses, that which is characterized by the existence of delusions of persecution is probably the most dangerous to the individual and to those about him.

The close relations between sanity and insanity are illustrated by the fact that the insane mind may be capable of performing useful mental labor, and may even originate much that is of value to humanity. The records of genius and of great works achieved, show how perilously near intellectual power may lie to intellectual ruin and how often great works, especially great works of the imagination, are the outcomes of an unbalanced or even of disordered mind.

Genius or the power of creative thought is not insanity and may exist in a well balanced intellect; but undoubtedly, genius is often an outshoot from an insane stock, and with equal certainty may we affirm that some men have accomplished great things, because one mental function was in them so overdeveloped that the whole mental structure was perpetually in danger of toppling over. Of all English prose works of fiction, I hold Bunyan's Pilgrim's

Progress to be one of the greatest, because it is the most read and most powerful in its influence upon the race. No one who is familiar with the history of Bunyan's life can gainsay the statement, that for a long time he suffered from monomania with delusions, and probably, in the gloom of his prison cell, his immortal dream was to him much more than a dream, it was a verity. Of modern novelists, Victor Hugo, the greatest, illustrates well the close relationship between insanity and genius. His uncle and his brother both died insane, one of his daughters is now, and has been for many years living in an insane asylum, and with the London *Medical Times*, I think we all may agree in asserting that some of his finest passages could only have been conceived by a diseased imagination, and are indelibly stamped with madness.

Space is wanting to do more than call attention to the overwhelming egotism of Byron; to the agonies of mental depression, which overshadowed the life of Cowper; to the hereditary madness, which led to the orgies of insane cruelty in so many of the world's ablest despots, whether among the ancient Romans or in the more recent Russian dynasties of Rurik and of Romanoff; to the hallucinations which caused Swedenborg to affirm that the hand of Christ "squeezed my hand hard," and Luther to declare that the devil came into his cell, stamped through his cloister and drove him from his bed; to the glorious visions which inspired Joan d' Arc with a faith almost divine and an energy irresistible; to the direct communication with God which enabled the son of Abdallah to link together millions in a confederacy of religious belief against which Christianity has as yet beaten in vain. If it were permissible these and many other historic biographies might be detailed to show how the most wondrous of all instruments, the human brain, may yield its finest work when it is itself distorted and deformed by the inheritance of the insane taint, even, perchance on the verge of hopeless ruin.

Reprinted from the
University Medical Magazine.
April, 1889.

ORIGINAL ARTICLES.

TWO CASES OF LATERAL OR HOMONYMOUS HEMIANOPSIA; TREPHINING IN ONE CASE. DEATH AND AUTOPSY.

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Lecture I.—Delivered at the University Hospital, February 1, 1889.

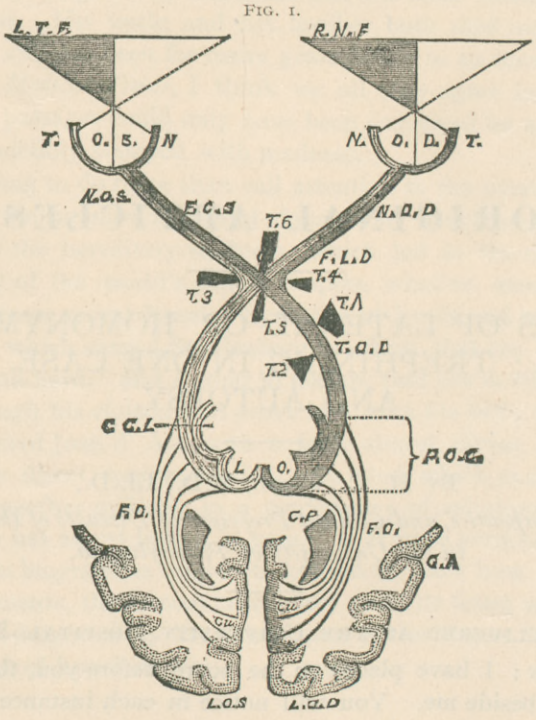
Gentlemen: I have placed on the board before you, the field of vision of the two cases beside me. You will notice in each instance that the patient is suffering from that form of hemianopsia which is known as lateral or homonymous hemianopsia; *i. e.*, that in each eye the vision is lost in corresponding halves of the two retinas; the left half of each retina, or the right half of each retina, as the case may be, being paralyzed. You will also see that there is a great contraction of the field of vision in the halves of the retinas which are still, to some extent, functionally active. This contraction is, I believe, the result of the alterations of the optic nerve, due to the condition known as choked disk, and is, therefore, a secondary phenomenon not directly due to the primary lesion.

In approaching the study of these cases, I shall first call your attention to lateral or homonymous hemianopsia as a symptom which enables us to locate a brain lesion, and which is therefore spoken of in modern parlance as a "localizing symptom."

The diagram which I show, is an old one, but that makes it no less serviceable in the explanation of the symptoms under consideration. The posterior portion of the diagram, LOD and LOS, represents the extreme ends of the occipital

lobes. That marked CU is the cuneus. From the cuneus, you will see, pass forward conducting fibres to the region marked P O C, which represents the *primary optic centres* including the corpora quadrigemina, corpora geniculata, etc. From this region run forward the optic nerves to the optic chiasm where there is a decussation of fibres. The decussating fibres do not intermingle, but remain as separate bands, the left hand nerve supplying the left side of each retina, and the right hand nerve the right side of each retina.

FIG. 1.



Any interference with the functional activity of the optic apparatus produces a corresponding interference with vision, but you will see at once that in order for the blindness to be localized in corresponding halves of the two retinas, the lesion must be posterior to the optic chiasm so as to interfere with the function of the optic nerve before it splits into its two divisions. We know, therefore, that in each of the two patients before us there is some lesion affecting the optic apparatus posterior to the chiasm.

The next point in our progressive diagnosis of the cases is to determine whether the lesion which produces the hemianopsia is situated posterior to the primary optic centres, or whether it is in those centres or in the nerve trunks between them and the chiasm. We are enabled to decide this by the study of the movements of the pupils. As you know, the pupils are the subject of many reflexes. In the performance of these reflex acts are concerned—as afferent, impulse-to-the-centre-carrying nerves, the optic nerves, and the general sensitive nerves of the body—as nerve centres, the primary optic centre—and as efferent nerves the ocular-motor nerves and their companion antagonists the sympathetic nerves. If a le-

sion be posterior to the primary optic centres in the optic tract it will produce hemianopsia, which is not accompanied with disturbance of the reflexes because it is entirely behind the reflex ocular apparatus. If the lesion, however, be either in the optic nerve or in the primary optic centres, the reflexes will suffer as much as the vision. A tumor which presses upon the optic nerve posterior to the chiasm, as at T2, in the diagram, so as to produce a lateral or homonymous hemianopsia, will so interfere with the reflexes as to give rise to the optic symptom first pointed out by Wernicke, and known as "hemiopic pupillary reaction," or, sometimes, Wernicke's pupillary reflex. In such an eye, a beam of light carefully thrown upon the blind side of the retina fails to produce contraction of the pupil because the impulse it generates in the retina cannot reach the reflex centre, it being stopped at T2 by the pressure of the tumor; but when thrown upon the opposite, or functionally active side of the retina, the light causes normal contractions.

A careful study of the reflexes in each of these cases has been made both by myself and Dr. de Schweinitz, and we have concluded that in each case the pupillary reflexes must be considered to be preserved, although the damage from the secondary alteration of the optic nerve, *i. e.*, from the alteration of the choked disk, has been such that the reflexes are in each case sluggish.

In the second case that I have here to-day—Mr. M.—a very curious condition of the reflexes is present, the exact meaning of which I am at a loss to understand. His pupils are abnormally large, and when a beam of bright light is thrown into them they contract slowly, but in a moment dilate again and then contract, and so oscillate backward and forward until they finally settle down into a condition in which the pupil is not so large as it has been, but is not nearly so small as the normal eye should be under such an amount of light. This condition of the pupil is technically termed *hippus*. I may say here that Dr. de Schweinitz has made a very protracted study of each case to determine the existence of anything like the hemiopic reaction, but no sign of its presence could be found. I think, therefore, that we must conclude that each of our patients has a lesion affecting the optic tracts, *i. e.*, situated posterior to the primary optic centres.

The physiologist Munk was, I believe, the first to point out as the results of experiments, that the seat of conscious visual perception in the dog is situated in the posterior portion of the occipital lobes. His general results have been abundantly confirmed, especially by Ferrier and Horsley. The exact position in the occipital lobes of the visual perception has been the source of some controversy. Attention has been especially directed to the angular gyrus and to that region in the posterior portion of the brain known as the cuneus. Ferrier destroyed in a monkey both angular gyri and obtained blindness, which, although for a time complete, in the course of a few days passed away. He removed the region of the cuneus without the destruction of the sight. In one experiment, he destroyed both occipital lobes and then the left angular gyrus, and after twenty-four hours vision was apparently normal; but in the second experiment unilateral destruction of the angular gyrus and of the occipital lobe caused permanent hemianopsia. In the studies of Horsley and Schäfer, destruc-

tion of the angular gyri and occipital lobe in the monkey caused permanent hemianopsia, so that I think we must conclude that those cases of Ferrier, in which the sight returned after the destruction of both of these centres, the cause of the return of sight was that the alleged destruction of the centres was only partial.

When both occipital lobes were removed by Horsley and Schäfer there was a complete but temporary blindness, and it would seem, therefore, that in the lower animals both the angular gyri and the occipital lobes are concerned in the visual perception, and that when one is destroyed the other is enabled to take on its function. It does not follow, however, that in man, the functions of the two centres are identical; from the lowest to the highest animal there is a progressive differentiation of cerebral centres, and it seems to me that we must of necessity expect to find that this differentiation has proceeded much further in the complicated brain of the man than in the comparatively simple cerebrum of the monkey. Undoubtedly tumors in the region of the angular gyrus have produced homonymous hemianopsia in man, but as was pointed out by Seguin, the conducting fibres passing from the occipital centres to the primary optic centres go directly under the angular gyrus, and are, therefore, liable to be pressed upon by tumors growing in this region. What light we have indicates that the angular gyrus is connected with the visual perception, but connected only so far as that visual perception is there converted into thought.

You will remember, no doubt, that we have two conditions occasionally occurring, one known as mind blindness, the other as word blindness. Mind blindness is the condition in which the patient sees objects, but is unable to connect them with the past so as to recognize their nature. He sees his father or his mother, his horse or his dog, but the perceived image fails to bring with it any conscious recognition of its nature. In word blindness, the subject sees the word, but the word brings no thought or no image or no meaning to his intellect. Macewen, in a very famous case, had, as the only localizing symptom, mind blindness, and boldly cutting down upon the angular gyrus removed the compression from it and restored the power of conscious recognition to his patient. In a case which recently died under the care of Prof. Osler, the brain of which I had the pleasure of seeing, the primary symptom was mind blindness, and the lesion involved the region of the angular gyrus. I think, therefore, that at present when in any case of hemianopsia there is not and has not been any mind or word blindness, the probabilities are that it is the posterior occipital centres which are at fault.

The exact point in the posterior occipital portions of the brain in which the visual centre resides is still a matter of controversy. My own belief is that these centres either vary in different individuals, or are more wide-spread out than some clinicians would allow. It appears to be certain that the cuneus is especially the centre of vision, for Haab, Huguenin, Féré, and Seguin have all described cases in which homonymous hemianopsia was present before death, and in which the lesion was confined to the cuneus. On the other hand Berger and Nothnagel have reported cases in which the lesion producing hemianopsia was restricted to the superior occipital convolution.

In each of the cases before us, there is homonymous or lateral hemianopsia, without mind blindness either in the past or present, and without disturbance of the pupillary reflexes ; and I think, therefore, that we must conclude that in each case the lesion affects the occipital lobes in their posterior portions, and is probably located so as to influence the cuneus, or possibly the superior occipital convolution. Although thus far our two cases seem similar, here the symptoms become divergent.

Let me examine the case of A. B. before you.

I ask the man to place his right forefinger on his nose, and he does so with certainty and promptness. I ask him to perform the same movement with the left forefinger. You at once notice the difference, the uncertainty and hesitation with which he moves the finger, and at last places it not upon his nose, but upon his cheek. There is nearly as much muscular power in the left arm as in the right, but the man has not the same control over the muscles of the left arm as he has over those of the right. If he undertakes to button his clothing with his left hand, he is scarcely able to do it. He is unable to pick up any small objects with the left hand. There is a loss of coördination rather than of strength in the left arm. By loss of coördination we mean the loss of power of directing movements, *i. e.*, loss of the ability to control the action of antagonistic muscles so as to make the part go in the desired direction. If the flexors contract a little too much, the nervous mechanism causes a contraction of the extensors so as to adjust the action of the muscles, or mayhap relaxes the flexors so that the part is moved in the direction that we wish. It might be thought a simple act to put the finger on the nose, but it is the result of a very complicated mechanism. An important part, the starting place of that mechanism, is the so-called muscular sense, a sense which is half unperceived by ourselves, but which enables the regulating nerve centre to tell exactly where the muscle is, and how it is contracting. When I put forth my arm, I have no perception of the contraction of any muscle in that arm. I do not estimate how far the biceps or the triceps is contracting, but without conscious perception, the lower nerve centre knows what the biceps is doing and how its antagonistic is acting, and regulates by means of that perception the movements of the muscles. Constant impulses must stream up from the contracting muscle giving to the brain knowledge of how much it is contracting. To this the term muscular sense is applied.

The muscular sense comes into the field of conscious perception under certain circumstances. If you take up a body, especially if your muscles have been well trained, you can tell very nearly how much that body weighs. That the power of recognizing weights is not due to the pressure on the skin, is shown by the fact that if the hand be placed on a solid body, and the weight laid upon it, we are unable to estimate the weight. In estimating the weight of a body, the hand is moved up and down, and the weight of the body is measured by the amount of force put out to lift. It is under these circumstances that the so-called muscular sense, which ordinarily does not reach up to the centres of perception, becomes consciously recognized.

We have seen that this man has not the power to move the muscles of the

left arm as he desires to do. Is this due to want of control or to loss of the muscular sense? Is it that he cannot make the muscles contract when he wills it, or is it because the lower nervous system does not know where the muscle is? Let us now test him with weights. With the right hand he gives us the correct weights when I place a one- and then a two-pound weight in his hand. With the left hand he says that a four-pound weight is about two pounds, and that a one-pound weight is about an ounce. We have repeated this test with weights a number of times with the same result. With the right hand, except with very light weights, he almost invariably gives the correct weight, but with the left hand he rarely comes within fifty per cent. of the correct weight. We must conclude, therefore, that there is a distinct loss of muscular sense, and that the want of coördination depends upon the inability of the brain centres to determine what movements the muscles are making.

The next point is with reference to common sensibility. There is slight loss of sensibility to the æsthesiometer in the left hand as compared with the right, but this varies from day to day. When I prick the left hand and ask him to place the finger of his right hand upon the place stuck, he fails to correctly indicate it, but as I go higher he does better. There is no distinct loss of power to distinguish between hot and cold applications. The sense of taste is good, the sense of smell is perfect, as is also hearing. All must agree that the loss of muscular sense is more pronounced than the loss of sensation.

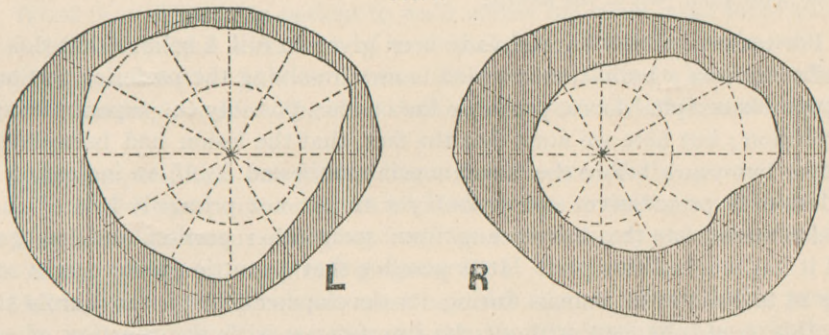
We have, therefore, gentlemen, in this patient, besides hemianopsia of the homonymous variety associated with retained pupillary reaction, loss of muscular sense of the left arm and some disorder of sensibility in the left arm, with very slight, indeed doubtful, changes of the muscular force of the left side. The seat of the muscular sense and of general sensibility cannot as yet be considered fully determined. In a number of experiments Dr. Ferrier found that after the destruction of the hippocampus there was a hemianæsthesia upon the opposite side of the body. On the other hand Profs. Horsley and Schäfer, repeating these experiments, have failed to get the same result; but in a series of experiments in which they exposed and removed the gyrus fornicatus, pronounced lessening of the sensibility on the opposite side of the body resulted. These two series of experiments are not, however, so flatly contradictory as they might seem, since the gyrus fornicatus and the gyrus hippocampus are anatomically continuous one with the other, and are probably, therefore, only parts of the one great centre. You will notice in the brain which I hold before me, how close these convolutions come to the cuneus, especially at the point where the gyrus fornicatus dips down to become the gyrus hippocampus. It is, therefore, probable that we have in this patient a lesion involving primarily the cuneus and, to a less extent, the hippocampus and the gyrus fornicatus.

Having located the lesion in our first case, let us study together a little more closely the second case.

Mr. M. is a clergyman; two years ago he came under the care of Dr. S. Weir Mitchell for convulsive or epileptic attacks. In October, 1887, he became my patient; at that time he stated that in 1885 he began to have spells in which he would be giddy and lose himself for a minute. This continued until June 30, 1886, when unconsciousness lasted sufficiently

long for him to fall. Similar attacks to this had occurred repeatedly before his visit to me, but in only two instances had there been violent convulsions, and there had been no history of headache or of any form of nocturnal attack. The attacks were not accompanied with aura or warning, except giddiness, which, he said, "seemed to deepen after a few seconds into unconsciousness." There was no cry, and no sleep after the attacks. The week before consulting me he had had three spells on as many successive days. His eyes had been examined by Dr. de Schweinitz while he was under the care of Dr. Mitchell, with

FIG. 2.



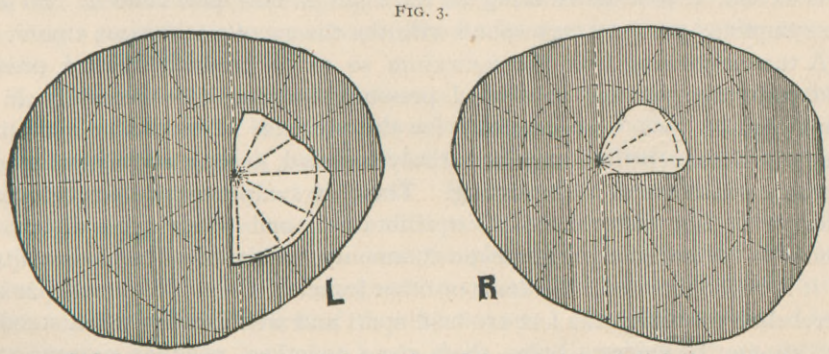
Concentric contraction of the fields of vision. The outer boundary marks the limits of the normal field; the shading indicates where vision was lost.

negative results. I sent him myself to Dr. de Schweinitz, who detected nothing abnormal except some haziness of the retina and small areas of fatty change in the choroids; form field was unaltered and acuity of vision normal.

During the winter and spring the attacks of giddiness were of short duration, and, to use the words of the patient, "the spells were only commencements, and are off like a flash."

On my return from my vacation in September, 1888, I received word that Mr. M. was suffering from severe headaches, and I asked him to come up from the country, which he did.

FIG. 3.



Left hemianopsia, with marked reduction of the remaining half fields, greatest upon the right side.

He then complained of loss of mental power, and inability to concentrate his thought. About two weeks before coming to me, he had been taken with violent paroxysmal pain over the eyes which had continued ever since. This headache was especially prone to waken him from sleep about five o'clock in the morning, and would last for two or three hours in its intensest degree. I found that he now had double choked disks, and sent him to the University Hospital, hoping that he would have some convulsive attacks which would enable us to locate the tumor which was apparently present. The examination of the field of vision by Dr. de Schweinitz at this time showed that it was concentrically contracted. (See Fig. 2.)

About the middle of January, 1889, Mr. M. again visited me at my solicitation, and finding that he was much worse, I sent him back to the Hospital for careful study. Dr. de Schweinitz again examined him, and the existence of left lateral hemianopsia (see Fig. 3) was now detected, but the most careful study of the case has failed to reveal any other symptoms than headache, choked disks, lateral or homonymous hemianopsia with the contraction of the preserved field of vision—unless it be disturbance of the power of balancing himself. The senses of taste, smell, and hearing, and general sensibility are intact. There is no muscular palsy, unless it be that connected with the pupil, of which I spoke in an early part of the lecture.

For reasons, which have already been given in full, I believe that this man is suffering from a brain tumor which is now involving the posterior portions of the superior occipital lobes, probably the cuneus, possibly the superior occipital convolution ; but here we must face the fact, that the lesion had been developing over two years before the hemianopsia manifested itself, an indication that the lesion is progressive, and probably a tumor not primarily located in the visual centres ; one that has sprung from some other portion, and has grown until it has reached this part. It is possible that a centric glioma might so develop as to isolate the cuneus during its development, but I can hardly think that this could happen without the interference with the function of other portions of the posterior central regions of the brain. It would seem, therefore, most probable that the growth is outside of the cuneus and outside of the brain itself. The tentorium lies not far below the cuneus separating the cerebrum from the cerebellum ; and it is conceivable that a tumor springing from the tentorium might so grow upward as after a time to involve the visual centres above it. It is well known that tumors in the tentorium are apt to be associated with excessive pain, and also, from their proximity to the base of the brain, that they are prone to give rise to strongly choked disks. The pain in this case is excessive, and the choking of the disks is most pronounced. So far as these symptoms go, they correspond with the theory of a tentorium tumor.

A tumor growing from the tentorium so as to produce upward pressure would naturally produce downward pressure, so that it is necessary in the present case to look very carefully for the presence of cerebellar symptoms. Tumors of the cerebellum may be entirely larvated, or may or may not produce symptoms which are at all localizing. The only symptom peculiar to cerebellar lesion is the disturbance of equilibration, and when such disturbance amounts to the peculiar phenomenon commonly spoken of as cerebellar titubation, it is pathognomonic of tumor or other lesion of the middle cerebellar lobe. In cerebellar titubation the feet are held apart and well forward when standing. If the attempt be made to bring them close together, peculiar movements of extension and flexion occur in the feet, and at the same time the trunk begins to rock and stagger more and more violently, until, in extreme cases, the subject falls unless he can seize some support. In the present case I think there are disturbances of equilibration, although such disturbances are not sufficiently pronounced to enable us to say that the man has distinct cerebellar titubation. You notice that he stands with his feet widely apart, and that in walking his feet are much more widely separated than in the normal man ; also that when he walks, the sway of the body is much greater than normal. Standing with

his feet wide apart, Mr. M. does not sway very much, but when his feet are brought close together the movements of the body become pronounced. He is entirely unable, as I show you, to stand upon one foot either with eyes open or shut; and both he himself and his wife assert that he staggers sometimes when he walks. His wife believes that he staggers always to the left.

The question is how far these symptoms are connected with muscular weakness, and how far they are due simply to lack of the power of balancing. [Dr. Wood then caused the patient to walk across the room, take turns quickly, and contrasted the gait with that of a normal man doing the same acts. He asked the class whether in their opinion there was a distinct loss of coördination or balancing power. The class decided unanimously that such symptom existed.]

I think myself that our patient has a disturbance of the power of equilibration. If this symptom really exist, it of course strengthens very much our idea that there is a tumor springing from the tentorium, or at least occupying a position near the tentorium pressing upward and downward.

Having made a diagnosis we must consider what is, after all, the practical question connected with these two unfortunate patients; that is, whether, as neurologists, it is our duty to call in the aid of the surgeon. In regard to the first case, I must decide against surgical interference, because the man is nearly seventy years old; has a pronounced general arterial atheroma; and has a distinct aneurismal enlargement of the innominate artery if not of the aorta itself. In such a case the dangers from the operation are far greater than in the normal individual. Moreover the symptoms are, in the main, making very slow progress, whilst the absence of headache and epileptic fits seems to me to make it more probable that the patient is suffering from a diffused gliomatous growth, than that he has a tumor springing from the brain membranes. The chances of removing a meningeal tumor successfully are far greater than is the case with an intracerebral glioma.

In the second case which is before us, I believe that surgical interference is justifiable. Our patient is a young man whose general bodily health is good, whose arteries are normal, and in whom the chances of recovery after a severe surgical operation would be very good. In answering the question as to surgical interference in such a case, you must ask yourselves two questions: In the first place, are you sure the tumor is at the place you have located it? In the second place, is it possible for surgeons to get at such tumor if the location be fixed? In answering the first of these questions, I can only say that I believe our reasoning has been logical and would be entirely reliable if we were only sure of our premises, but there are some of our premises concerning which we are not certain. I have taken it for granted in the discussion, that there is a distinct lateral or homonymous hemianopsia. I believe that it does exist, but there is so much secondary disease of the optic nerve, and so much secondary contraction of the field of vision, that in one eye nearly the whole field has been obliterated, and in the other eye, that half of the field of vision which retains some functional activity, is very much contracted—so that the possibility suggests itself that the apparent hemianopsia is not real, but that the optic

nerve itself has undergone such an irregular change as to produce an irregular alteration of the visual field and an apparent hemianopsia. I do not think that this has occurred, but herein certainly lies one source of doubt. Then again we have relied upon the absence of mind blindness as disproving the possibility of tumor in the region of the angular gyrus. Here, however, I think we are a little ahead of our times. At present we can only say, that what light we have indicates that the recognition of objects is the function of the gyrus angularis, and that interference with this function produces mind blindness. We have not, however, sufficient light to make our generalization a certainty. We have evidently two possibly mistaken premises; if we were sure of the supposed cerebellar symptom, if the disturbances of equilibration were more marked, and pronounced cerebellar titubation existed, we would have firmer ground under our feet; we would know that we had a tumor involving the cerebellum and the visual centres of the posterior occipital region. I repeat that I believe that some lack of coördination exists, and that although the diagnosis is not an absolutely positive one, and although possible fallacies underlie our reasoning, yet we have sufficient light to require us to search for the tumor in the man's brain. The man must die if the surgeon is not able to remove the tumor, and I think we are bound to look for it in the place where it is most probably located. If after exposing this region, the surgeon fails to find the tumor, it will become our duty to disregard the supposed mind blindness and visual perception function of the gyrus angularis, and direct him to cut down upon the region of that convolution. As neurologists we decide that this is a case for an operation. As to the possibility of the removal of a tumor of the tentorium I believe it can be done, but am not prepared to-day to give a positive answer. I have referred the case to Prof. Agnew, and if he believes there is any possibility, as it seems to me there is, of reaching a tumor at the position assigned at the present, I have no doubt that he will perform the operation.

LECTURE II.—DELIVERED AT THE UNIVERSITY HOSPITAL, February 8, 1889.

GENTLEMEN: In regard to the case of Mr. Morgan, whom I showed at the last clinic, February 1st, I will read you the following letter from Dr. de Schweinitz.

FEBRUARY 6TH, 1889.

MY DEAR DOCTOR: I made a very careful examination of F. M. M.'s ocular conditions this afternoon, and found distinct changes from the last examination a week ago, as follows:—

Right eye.—This is now *totally blind.* In no portion of the field of vision is there the faintest light perception, not even to strong condensed light. The optic nerve is distinctly more swollen, and there are several fresh retinal hemorrhages. Of course no determination of the field is possible inasmuch as every particle is obliterated. (See Fig. 4.)

Left eye.—The field is as before, showing complete absence of the left half, with partial preservation of the right half of the field. That portion preserved, however, is considerably contracted in comparison with what we found one week ago.

There is a slight divergent squint, probably due to the lack of fixation in the eyes, inasmuch as the excursion of the eye-balls in all directions is still preserved.

The pupils, facing a bright light, are slightly unequal, the right being the larger. Both pupils react sluggishly to the changes of light and shade, but the right pupil is more sluggish in its action than the left.

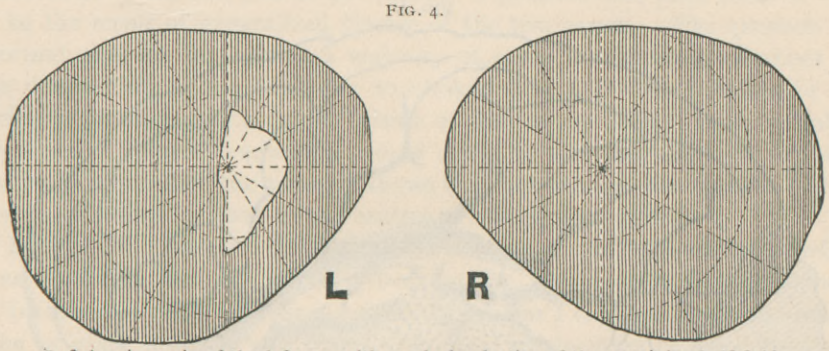
The consensual contraction of the pupils is preserved. It was not possible to demonstrate the hemiopic pupillary reaction.

I do not presume to explain these changes, except that it strikes me that the indications are that the local conditions in the eye (the increasing neuritis) may explain them, and that the case should not be looked upon as a typical hemianopsia. Certainly I have never seen such rapid changes taking place in hemianopic fields.

Yours truly, G. E. DE SCHWEINITZ.

You see at once that the case is a doubtful one on account of the uncertainty as to the existence or non-existence of a true lateral or homonymous hemianopsia. I still believe, however, that the probabilities are in favor of the existence of a tumor at the position where I have located it. I myself have never seen a case of simple choked disk produce such rapid and *peculiar* alterations of the visual field, whilst the preservation of the reflexes, the absence of the hemiopic reaction indicate that the alterations of sight are not the result of

FIG. 4.



Left hemianopsia of the left eye, with marked reduction of the remaining half field. Total blindness of the right eye.

direct pressure upon the optic nerves; further, a tumor producing so much choked disk if situated at the base of the brain, almost certainly reveals itself by distinct ocular or other localizing palsy.

It is conceivable that a very large tumor in the frontal or latent region of the brain might produce no localizing symptom, and derange sight by a secondary inflammation of the optic nerve; so that it seems to me as probable that the tumor is frontal as that it is situated on the anterior base of the brain. I adhere to my original view as the most probable one, because the rapid loss of sight may be very well explained by the supposition that the tumor growing upward and from the tentorium primarily involved one cuneus, but is now pressing upon the cuneus of the opposite side. Further, I think the cerebellar symptoms in Mr. M.'s case have become somewhat less uncertain, in that there has been increase in the swaying movements of his body during standing and walking. After all, however, the position of the tumor is uncertain, but the certainty of death unless relief be obtained by surgical interference makes such interference our duty, although the operation must be tentative and with a considerable probability of ending in failure. Dr. Agnew believes that if the tumor be in the location named he can extricate it. It is proposed that the patient be operated upon in the coming week, and the result will be reported at my next clinic.

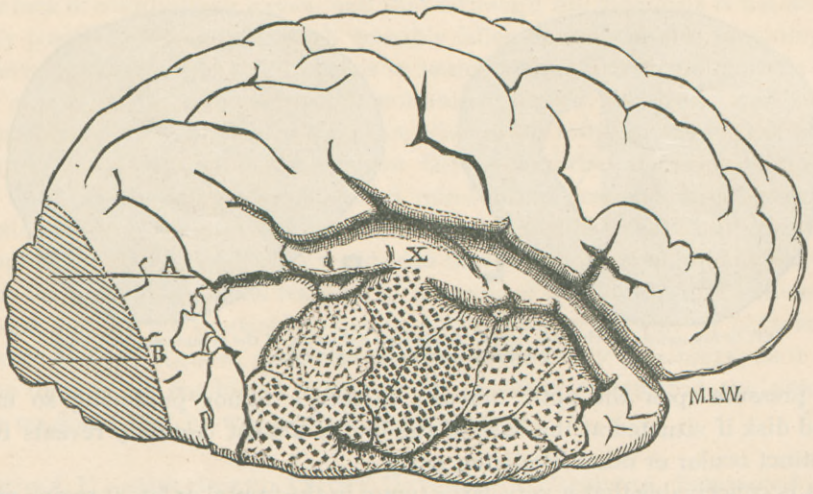
LECTURE III.—DELIVERED AT THE HOSPITAL, February 16, 1889.

I propose to devote the first portion of our hour to the continuation of the study of the case which has been before us in our thoughts during the previous two meetings. I refer to the case of Mr. M.—brain tumor.

On Saturday morning, February 9th, Dr. de Schweinitz found that *the vision had returned in the right eye*, and that the fields of vision were the same as when the hemiopic defect was originally found. (See Fig. 3.) Under all the circumstances, for the reasons which I stated in the last clinic, it was decided to operate on Mr. M. on Monday, February 11th.

Dr. Agnew opened the brain and exposed the cuneus, the region where I had located the tumor; this was apparently absolutely healthy. We felt of the brain cortex and of the tentorium, but there were no evidences of disease. When, however, the attempt was made to replace the brain into the dura mater,

FIG. 5.



The dotted area represents the situation of the tumor. The lines A and B represent the position of softening running through the centre of the occipital lobe. The shaded area shows the portion of the brain exposed at the operation.

it was found impossible to put it back, showing that it was under great pressure. I then insisted on the cuneus being opened. When this was done, Dr. Agnew said at once, "There is a cystic tumor." The cavity was found immediately beneath the gray matter of the cuneus of a considerable size, and since the autopsy it has been determined that it is a patch of hemorrhagic inflammatory softening with definite walls formed by the infiltration of the brain substance by leucocytes.

Mr. M. lost a great deal of blood during the operation, and after a length of time it showed hardly upon him; but he rallied to a certain extent and regained consciousness, but two or three hours later commenced to fail in his circulation, and the same evening at 9 or 10 o'clock died.

When the autopsy was made, the brain, which is now before us, was removed. You see that there is occupying the second and third temporal and encroaching on the fourth convolution an enormous tumor, and, although we

have cut down nearly two inches into the brain, still the tumor is perceptible. It occupies the centre of the lobe and reaches anteriorly and posteriorly through nearly the whole lobe. The uncinate convolution, the hook convolution, is not encroached or pressed upon. I want next to call your attention to the fact that there is a patch of hemorrhagic softening in the cuneus which is known as the region of visual perception ; and that there is a line of softening running nearly the whole length of the centre of the occipital lobe. (See Fig. 5, lines B and A respectively.)

In cases of excessive choked disk, contraction of the field of vision occurs, and the ophthalmologists were inclined to believe that in the present case this contraction had occurred irregularly in such a way as to produce the fields of vision that I have represented to you. On the other hand, I myself was of the opinion that two factors entered into the formation of the visual field ; that there was a centric hemianopsia coincident with an irregular contraction from choked disk. I did not, and do not, believe it possible that such fields of vision can be the result of generalized disease of the two nerves. The question is an important one, for in perhaps a majority of cases hemianopsia co-exists with some contraction of the field due to choked disk. If it be possible for optic neuritis to produce such a field of vision as that of the present case, I think the recognition of centric hemianopsia could rarely be a certain one. So far as this question is concerned, the autopsy shows that my opinion was correct, and that there was a lesion far back in the centres of visual perception.

During life I believed that there was a lesion of the optic centres, and that it was secondary and not primary, because the hemianopsia had developed so late in the case. So far I was correct ; but when I came to locate the position of the original lesion I was wrong. I made my location because the absence of distinct symptoms showed that the tumor was located somewhere in a region of silence, and because of my belief there are only two such regions in the brain : one in the frontal lobe, one in the cerebellum. The frontal lobe is so far distant from the occipital lobe that I considered it exceedingly improbable that the tumor was in it. On the other hand, the cerebellum is so near the occipital lobe that it seemed extremely probable that the tumor was connected with it. Moreover there were certain symptoms in regard to equilibration which we now know must have been the result of the general brain pressure, but which during life gave at least a plausible pretext for supposing that they might be produced by a cerebellar tumor. The fallacy in the reasoning was in the premise, *i. e.*, in considering the temporal lobe to be a region in which tumors produce active symptoms.

We all know that it is not positively settled where the centres of conscious audition are ; but the general drift of authority is strongly toward locating the auditory centres in the temporal lobe. Without entering into a discussion of the evidences, let me read to you two quotations. Dr. Gowers says : "Only one symptom is caused by disease of the outer aspect : deafness in the opposite ear when the disease involves the hinder half of the highest convolution, and an auditory aura if convulsions are caused by a lesion in or near this part."

Dr. Mills, in his recent paper on "Cerebral Localization," says: "While auditory localization remains in a somewhat uncertain state on the whole, the evidence is in favor of the localization of the cerebral centres of hearing in the temporal lobe, and probably in its upper portion, that is, in the first or second, or in both the first and second temporal gyres."

In the case of Mr. M. unfortunately no test was made to determine whether there was any restriction of the power of distinguishing high and low notes; but he was a man of such intelligence that any alteration of this character in hearing, if at all pronounced, would in all probability have been noticed by him. So far as testing with the watch is concerned, his hearing was normal; nor were the convulsions or giddy spells at any time ushered in with an auditory aura. The present case therefore proves that the whole right temporal lobe, except the first convolution, may be involved in a tumor, without the production of any immediate direct symptom, and that this region must therefore be put among the silent regions of the brain. The first convolution was somewhat flattened above the tumor which impinged upon it directly, and at one place had bridged over the sulcus and encroached upon the convolution itself. If the first temporal convolution be the seat of exclusive hearing for one ear, as alleged, it is very extraordinary that no disturbances of hearing were caused by this enormous growth. In all future localizations, I shall myself believe that we have to deal with three possible silent regions—the cerebellum, and the frontal and the temporal lobes.

Another very important question in connection with the present case is as to the cause of the secondary brain degeneration. You will remember that the posterior portions of the occipital lobe are fed by the posterior cerebral artery, and the thought immediately arose that the tumor may have pressed upon this and caused thrombic arrest of respiration. Careful examination however failed to find any thrombus or any apparent disease of the posterior cerebral artery; moreover this artery supplies the cortex as well as inner portions in the occipital lobe, and the cortex of the cuneus was normal. It is evident then that there was no large thrombus or other wide-reaching arterial implication. You will no doubt also remember that there are two sets of arteries arising from the posterior cerebral artery, one set of perforating arteries going up to supply the inner portion of the brain—the other, cortical arterioles dipping down into the cortex; that these two sets of arterioles are each independent, terminal, non-anastomosing vessels; and that further there is a portion of the brain which lies between the territory supplied abundantly by these terminal vessels—a zone between the inner and outer zones which is not very vascular and which is always liable to softening from starvation when there is serious interference with the general brain circulation. It is apparently in this zone that softening has occurred, and it would seem at present as though we must account for these secondary lesions by supposing that they are the result of impairment of the general nutrition of the occipital lobe by excessive pressure. Possibly when the brain has been hardened and very carefully studied other explanation may be found.

The study of secondary lesions in brain tumor, as shown by the present

case, are very important. Mr. M. had been long under observation, and it was known that the hemianopsia was developed late in the case ; but most cases of hemianopsia come to the physician's notice with the symptom fully developed, so that it may be impossible to say whether it is an original or a secondary symptom. Such is the case with the man whom I had at the clinic along with Mr. M. We do not know whether his hemianopsia is an original symptom, or whether it is a symptom which has been developed secondarily upon a tumor existing in the temporal lobe or in some other silent region.

In the light of this case, it is evident that a very serious embarrassment to the neurologist must frequently arise from his inability to determine whether certain symptoms are secondary or primary.