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Original Articles.

TUMOR OF THE CEREBELLUM WITH MONOCULAR HEMIANOPIA.

By J. T. ESKRIDGE, M.D.,

POST-GRADUATE INSTRUCTOR ON NERVOUS DISEASES IN THE JEFFERSON MEDICAL COLLEGE, OF PHILADELPHIA AND PHYSICIAN TO THE HOSPITAL OF THE SAME.

THE carefully studied clinical history and post-mortem results of every case of brain tumor are possessed of interest, whether the morbid growth has been attended by symptoms so slight as scarcely to attract attention, or whether its presence nas been manifest by evidences so clear as to make a diagnosis comparatively easy both as to extent and situation of the disease. In the former case we find that large areas of certain portions of the brain may be destroyed during life without giving rise to marked symptoms; in the latter other parts resent injury by invariable and characteristic manifestations. In both something of the function of different regions of the brain may be learned. The following case of tumor of the cerebellum with monocular hemianopia is specially interesting in connection with the published histories of lesions of this portion of the brain.

CASE.—Elizabeth B., æt. thirty-two, married, housework, was delicate and nervous. Her father, mother, and eight brothers enjoyed good health. So far as she knew none of her relatives had suffered from cancer, phthisis, or nervous affections. She had never had convulsions, and was well until her ninth year, when

she contracted scarlet-fever. Convalescence was slow, and she was left deaf on the right ear. There was no history of chronic otorrhœa. At the age of nineteen she was married. Her husband, whom she nursed and slept with during his illness, died six years later of consumption. During this union she conceived twice but aborted each time about the third month. When she was twenty-four years old she had an attack of inflammatory rheumatism lasting nine weeks. During the last few years her health had not been good. She had suffered from indigestion and some uterine ailment. At her menstrual periods she had had left-sided migraine. In November, 1882, she was married the second time.

At that time she was feeling tolerably well, but soon after this marriage she began to suffer from severe and more or less constant headache.

The seat of pain changed from time to time. Sometimes it was in the back of the head, at others in the right or left side, but most frequently it was complained of in the top and frontal region. In February, three months after her marriage, the right eye became very painful, and the right arm and leg numb. The sensation of flashes of light were noticed in the eye when the lids were closed. At that time vision was very poor in the right eye, but subsequently it improved slightly. Soon after the beginning of the trouble in the right eye the left became similarly affected, but vision in this eye did not improve. Her last menstrual period occurred in April.

Shortly after the cessation of the menstrual flow, she began to vomit early in the morning, and sometimes during the day. The vomiting was never connected with taking food. By June she began to be troubled with vertiginous sensations when in the erect posture. Pain in the top and left side of the head was quite severe and almost constant. When she was admitted to the hospital of the Jefferson Medical College, in the latter part of July, vomiting and headache were the most prominent symptoms complained of.

Assisted by Dr. Parrott, one of the resident physicians of the hospital, I made the following observations of her condition soon after her admission into the medical ward.

She was pale, anæmic, and much emaciated. There was no apparent special cachectic appearance. No tremor or twitching of the muscles was observed. Grasp of the left hand fairly good, that of the right greatly diminished. Walking seemed at first attempt impossible, but by persuasion she was able to walk a few steps between two assistants. The difficulty in locomotion appeared to be due to several causes: want of confidence in her ability to keep from falling, the paretic condition of the right leg, and ataxic state of the muscles of both legs. By a strong effort of her will she was largely able to overcome the ataxia. Walking with eyes shut was more difficult than with eyes open. After considerable effort on her part, she succeeded, with closed eyes, in turning around, and

in standing erect while her feet were close to each other. With closed eyes it was impossible to get her to walk forward or backward unless she was partially supported by two assistants. She was kept in the erect posture only a few minutes, but the exertion brought on such a degree of prostration, attended by pallor, nausea, and vomiting, that I feared to again test her ability to walk. This attack of vomiting lasted, with great distress, more than an hour. Electro-muscular contractility to the faradic current was nearly equal on each side, and slightly increased over the normal. Patellar reflexes were diminished, but about equal on both sides. The tongue in forced protrusion deviated slightly to the left. Facial muscles appeared to be unaffected. Speech was slow and hesitating, but articulation good. Left pupil normal, right slightly dilated. Both reacted to light, but the left to a greater degree.

Special Senses.—Sensations of pain, touch, and location were equal on both sides and well preserved; hearing, in right ear destroyed since childhood, in left fairly good; smell unaffected; taste, abolished on the right side, normal on the left; sight—with right eye fingers were counted at ten feet, with left at six feet. The field of vision in the right eye was good, but in the left hemianopia of the temporal side existed and apparently extended up to about the median line. On examining the eyes with the ophthalmoscope pronounced optic neuritis descendens was found in both eyes. In the left eye the disc was greatly swollen, the veins were tortuous, the arteries narrowed, and several small recent hemorrhagic spots around the papilla existed. In the right eye the disc was not as prominent as in the left, but it was lighter in color; the veins were not congested, but the arteries were smaller than normal. In this eye (the right) the stage of acute papillitis had passed. On several subsequent occasions I re-examined the field of vision in each eye, but found no appreciable change from that present at the first examination. No incontinence of urine or fæces. Bowels slightly constipated. Urine contained neither albumen nor sugar. The quantity of urine varied greatly from day to day, but at no time was there a condition of polyuria. Pain in the head was constant, and much of the time very severe. It was located most frequently in the front and top of the head, but when complained of on the sides it was usually worse on the left. Occipital region had not for some time been the seat of pain. During the first week of August she complained of shooting pains in the legs and left arm, and occasionally of pain in right or deaf ear. There was no pain in stomach or back.

Mind was clear, but she was hysterical and exceedingly emotional. To such a degree were the emotional faculties manifest that had there been no ocular lesion there would have been great danger of mistaking the case for one of pure hysteria. Indeed a very careful physician of many years' experience, who had examined her the day before I saw her, not knowing the condition of the eyes, pronounced the woman's condition to be pregnancy complicated by hysteria. This he did after he had been apprized

of the fact that another physician had diagnosticated brain tumor. She vomited three or four times daily. An attack of nausea, which would frequently be followed by vomiting, could be brought on by her looking intently at an object for a few minutes. The thoracic and abdominal viscera were apparently healthy. The womb was enlarged and contained a fœtus at about the middle of gestation. The fœtal heart-sounds were heard the first week in August. During August the urine became very alkaline, and contained considerable pus and mucus. By the last of the month micturition at the close of each effort to empty the bladder became painful. August 6th the following temperature observations were made. The weather was clear, temperature in shade, 78°

TEMPERATURE.

Axillary, R 98.6° ; L 98.6°.

Head :

Anterior frontal station,	R 98.4° ;	L 98.4°.
Posterior " "	R 98.5° ;	L 98.6°.
Superior " "	R 98.4° ;	L 98.4°.
Parietal "	R 99.2° ;	L 98.6°.
Rolandic "	R 98.8° ;	L 99.1°.
Occipital "	R 99.4° ;	L 99.1°.
Posterior central "	99°.	
Anterior " "	99°.	

During August and September the progress of the disease was gradual, and no change in the symptoms was noted beyond increasing difficulty to stand, severer paroxysms of headache, and development of mental aberration during the latter part of the afternoon and early evening. At these times she sobbed, cried, and talked incoherently. Early in October she was transferred to the Woman's Hospital. About the middle of December she became unconscious, and on the 24th of the same month uterine contractions commenced. The next day shortly before labor was completed she died. The child was rapidly delivered by the forceps, but it was still-born.

Through the kindness of Dr. Emma V. Boone, pathologist to the Woman's Hospital, I obtained the morbid growth found in the brain, with a short account of the post-mortem made by her. The patient was admitted to the Woman's Hospital at so late a stage of the disease that she was unable to give a connected history of herself. Dr. Boone, who never saw the woman until after her death, knew nothing of her history, and did not expect to find any thing in the brain peculiarly interesting. This apology is due to Dr. Boone, who was surprised to learn that the case had been carefully studied early in the disease.

"Autopsy fifteen hours after death : Rigor mortis complete. On opening the cranium, the dura mater was found to be congested and thickened over the convexity of the brain. Longitudinal sinus contained dark coagulated blood. Left side of pia

mater markedly congested (*post mortem* ?). Increase of fluid in both lateral ventricles. On cutting through the tentorium, a nodular tumor, the size of a large horse-chestnut, was found resting on the upper surface of the right lateral hemisphere of the cerebellum. Other portions of the brain appeared normal. The optic nerves were not critically examined. Thoracic cavity : On the right side pleuritic adhesions were extensive, and the lung markedly congested. Left lung normal. No increase of pericardial fluid. Right ventricle of heart occupied by a fibrinous clot ; left ventricle contained dark clotted blood. Abdomen : Uterus extended to umbilicus. Placenta, which was undelivered, showed signs of degeneration. Ovaries in iliac fossæ. Spleen soft and friable. Left kidney was somewhat enlarged, its capsule abnormally adherent, and the ureter, dilated at its upper portion, contained pus. Right kidney was larger than the left, and its cortical substance, slightly decreased, was the seat of several small abscesses. Its pelvis and ureter were dilated and contained pus. Vessels of stomach were injected. Liver was pale and presented evidences of fatty degeneration."

The tumor was found, on microscopic examination by Dr. Formad, to be sarcomatous, of the spindle-cell variety.

Remarks.—Monocular hemianopia, which was present in the case just reported, is rare, and peculiarly interesting in connection with brain tumor. The most frequent forms of hemianopia are those in which both right or both left sides of the retinæ are blind ; next in frequency are those in which the temporal halves of the fields are blind. The least frequent and very rare are cases in which the nasal sides of the fields are absent. In the first variety, in which the homonymous sides are affected, the blind fields are usually sharply defined and reach up to the median line, but in cases of nasal or temporal blindness the fields are apt to be irregular—(Noyes, " Diseases of Eye "). According to Ferrier's first conclusions (Ferrier, " Functions of the Brain," 1876), the region of the angular gyrus is the psychological seat of vision, but the riper and repeated work of Munk, together with the investigations of Wernicke and Stilling, and the subsequent observations of Ferrier, point very conclusively to the cortical substance of certain portions of the occipital lobe as the centres of vision.

Munk's recent conclusions are given as follows :

" 1. The occipital lobes of the brain are necessary for the perception of visual impressions. Destruction of both occipital lobes produces total and permanent blindness.

" 2. Each occipital lobe is in functional relation with both eyes in such a manner that corresponding halves of both retinal areas are projected upon the cortex of the lobe of the like-named side; *e. g.*, destruction of the left lobe produces loss of function of the left halves of both retinæ.

" 3. On the cortex of each occipital lobe the anterior segment corresponds to the upper half of the retinæ; the posterior to the lower half; the external half to the temporal half of the eye of the same side "—(Starr, " Visual Area in the Brain," *American Journal of the Medical Sciences*, Jan., 1884). In the article just referred to Dr. Starr very industriously collected the reports of twenty-seven cases of lesion of the occipital region in which blindness of one half of each retina occurred. In every instance the right halves of the retinæ were involved when the left occipital region, or fibres leading thereto, were affected, and *vice versa*. It is only necessary that I should call attention to the fact, established by researches in anatomy, pathology, and experimental physiology, that hemianopia may result from a lesion in the cortex of the posterior occipital lobe, the intermediate ganglia, viz., the thalamus, the geniculate and quadrigeminal bodies, or in the optic nerves themselves.

Monocular hemianopia, according to Noyes (" Diseases of the Eye "), can take place only by lesion of one nerve in front of the chiasm. He states that Mauthner reported one such case without autopsy. In the case that forms the subject of this article the temporal side of the field of the left eye was absent; the field of the right eye was not contracted. The blind area was sharply defined and reached up apparently to the median line. It is not probable that I was mistaken in my observations. I repeatedly examined the fields and found them as stated. On one occasion Dr. Fox, who knew nothing of the results of my examination, at my request examined the eyes. He reported monocular hemianopia of the left eye. I regret that the optic nerves were not more critically examined after death, but in the absence of any gross lesion of the nerve beyond the chiasm, and in the presence of a tumor in the posterior region of the brain, in such a position as to produce pressure upon the occipital

lobe of the right side, corresponding in this respect to the blind side of the retina of the left eye, I am inclined to attribute the monocular hemianopia to the presence of the morbid growth found just beneath the tentorium.

The electro-muscular contractility was increased, but the patellar reflexes were diminished on both sides. I am not aware that the condition of the reflexes in cerebellar lesions attended with ataxic symptoms has been thoroughly studied. Granting that they are usually increased, which I think is doubtful, the condition of the patellar reflexes in the present case could be accounted for from the exhausted state of the patient invariably induced by exertion, and that only to an extent sufficient for a thorough examination. I have observed in many persons who were in apparently good health the knee jerk to be greatly diminished by exhausting walks.

I had an excellent opportunity to study the influence of the will over the higher reflex centres. On first attempting to walk, after I first saw her, she was apparently unable to do it, but with an assistant, who gave her no physical support, on each side of her, and being persuaded that she could walk, she did so, and even succeeded with closed eyes in turning around and in standing erect with feet placed against each other. The exertion required for her to co-ordinate her muscles, even in simple movements, was great, and caused considerable exhaustion. Looking intently at an object, holding the arms out from the body, or performing slight movements for a minute or two at a time only, produced such exhaustion that nausea and vomiting followed.

In this connection the recent and interesting experiment of Prof. Luciani, who has succeeded in removing the entire cerebellum of a dog without destroying the life of the animal, will help to explain why the patient was able to overcome, by will-force, her ataxia in walking to a great extent. Herbert Spencer, Jackson, and Ross believe that the cerebellum has a tonic invigorating influence over the muscles. The experiment of Luciani tends to confirm this view. He found, after the removal of the cerebellum, dur-

ing the stage of irritation resulting from the operation, that symptoms of inco-ordination were present, but as recovery advanced, "however, these disappeared, and a kind of muscular asthenia or loss of tone took their place"—(*Medical Record*, Dec. 27, 1884).

If the sense of taste is located, as inferred by Ferrier, in a portion of the temporo-sphenoidal lobe (subiculum) of the opposite side, I have no theory to offer in explanation of the absence of the sense of taste on the right side of the tongue in the present case, except it occurred through pressure on the chorda tympani nerve, which is the gustatory nerve to the anterior portion of the tongue.

The cerebral temperature observations in this case corroborate the conclusions at which I had arrived from the study of cerebral surface temperature in other brain diseases, viz.: "that a high head temperature extending over a considerable period, while the axillary heat was normal or below, pointed to organic lesion of the brain or its membranes"; and further, that I "was not yet satisfied that surface thermometers would enable us to locate lesions in different portions of the brain with sufficient accuracy for general diagnostic or therapeutic purposes"—("Transactions of the College of Physicians of Philadelphia," third series, volume vi.).

A CASE OF PAINFUL PARAPLEGIA—DEATH—AUTOPSY REVEALING SARCOMA OF THE VERTEBRÆ.

By G. W. H. KEMPER, M.D.

MUNCIE, IND.

I DEEM a report of the following interesting and rather unique case worthy of publication. The patient was a very intelligent lady, and the wife of a prominent politician of national celebrity. Her home was in Washington, D. C., and during the past summer, while on a visit to her parents in this city, her disease gradually reduced her to a state of helplessness, which was followed by death.

I saw her first on the 21st day of August, 1884. On the following day, Dr. W. H. Myers, of Ft. Wayne, was called in consultation. We gleaned the following history of her case:

Mrs. E. W. B., age forty-four years, married, and mother of three children, the youngest now thirteen. While Mrs. B. had never been robust, she had led an active life. She gave a history of mammary cancer, the removal of which is described in the following extract from a letter to me by Dr. A. Y. P. Garnett, of Washington, the family physician, under date of Dec. 28, 1884: "By reference to my books I find that Dr. Ashford, since dead, removed from her left mamma a tumor about the size of a pullet's egg, on the 18th of Aug., 1878. The wound healed kindly in two weeks, and as there was no lymphatic contamination, she seemed entirely free from all future trouble. My attention was called in May, 1883, to her condition, and upon examination I found the remaining portion, consisting of more than half of the mammary gland, had become painful and indurated, but could discover no involvement of the adjacent glands. On the 29th of May, 1883, I removed the entire gland. In both instances the specimens

removed were submitted to microscopical examination, and characteristic cancer cells found present."

A third tumor appeared soon after the last operation, in the cicatrix, and this was shortly followed by an enlargement of one of the axillary glands of the corresponding side. At the time of our visit these tumors were near the same size and about that of a quail's egg. A perceptible prominence was observable over the eighth and ninth dorsal vertebræ.

She was lying upon her back with her lower extremities extended. She had the power, rather feebly however, to flex and extend the lower extremities, and could very well control the movements of the upper extremities. She already had lain in this position for six weeks when we saw her, and had been treated by a homœopathic physician for rheumatism. She was utterly unable to raise her head or turn in bed; in fact, it was at the cost of very great pain that she could be even carefully turned or lifted temporarily from her supine position. The spine showed upon pressure considerable tenderness over the greater portion of its extent, and was so inflexible that the least curving in any direction gave rise to distressing pains, especially cervico-brachial. A peculiar symptom that she dwelt upon at this and other times in the course of the disease, was "a feeling as if the contents of the abdomen would fall out through the abdominal walls." This sensation was disagreeable rather than painful, and had annoyed her for some weeks.

Her temperature was 99½°, respiration regular and normal, and the pulse numbered 85. The tongue was clean; the bowels were moved normally every day. The secretion of urine was natural; and the uterine functions were perfect in every respect, the climacterium not having been reached. When she lay still, she was comparatively free from pain, but had occasional pains in the several extremities.

We considered the case one of "spinal irritation," possibly complicated with congestion, and due to malarial origin, inasmuch as she had suffered from malarial attacks before coming to Muncie. The two tumors were regarded as possible factors aggravating her condition, and their early removal advised. A thorough course of quinine, in connection with ergot and tonics was recommended.

A perseverance in the plan of treatment named for a time, seemed to improve the general condition of her health, but not to any marked degree. The spinal symptoms were not improved, but, on the contrary, after a time her helplessness gradually increased. Pain now became a more common symptom, affecting the region of the right shoulder, intercostal spaces of both sides, and across the lumbar regions. A loss of motion began, and gradually involved the whole extent, first of the right arm, then the right hip, thigh, and leg. Vague neuralgic pains of greater or less severity affected by turns different portions of the body, and occasionally the extremities. Her general strength not improving, but rather declining, and the spinal symptoms increasing, accom-

panied with increasing numbness of the muscles of portions of the body, and especially the lower extremities, led me to think that we had not made a correct diagnosis. I now became convinced that it was a case of painful paraplegia, due to slow compression of the spinal cord from cancerous tissue in the vertebræ.

On September 29th, Dr. Myers saw the patient for the second time. With much difficulty, because of pain to our patient, we made a careful examination of the spinal column. The spinal tumor remained about the same size as before. Tenderness was excessive over all the vertebræ. Partial loss of sensation and motion in the lower extremities, body, and right arm were well marked. All these symptoms, co-existent with mammary cancer, seemed to point so clearly to secondary vertebral cancer, that Dr. Myers coincided with my diagnosis. A tentative tonic course of treatment was agreed upon. I may add that this was about the period when Mrs. B. suffered the greatest pain. Motion and sensation failed to a more marked degree during the next few days.

About the 6th of October dyspnœa began to manifest itself. Also at this time frequent and painful micturition developed, and was treated with belladonna. This remedy produced unpleasant constitutional effects, which slowly passed away. A new train of symptoms suddenly developed on the 7th. Up to this time micturition and defecation had been under the control of the will, but now marked tympanites of the intestines developed [1]; and also sensation and motion of the abdominal walls, as well as the abdominal viscera, were completely lost. From this day to that of her death, the bowels were never evacuated, except by aid of enemata or saline cathartics, nor the bladder except with the catheter. The distension of the abdomen was extreme, and so encroached upon the diaphragm, which was forced upward, diminishing the thoraic cavity until dyspnœa became marked and distressing.

From this time the paralysis gradually invaded other portions. Loss of motion, which had been gradually affecting the right arm, became complete. The extent of the tympanites varied at different times, owing to the condition of the bowels. Evacuations occurred generally at intervals of three or four days. Kneading the abdomen assisted in relieving the distension. The tongue was habitually clean. The "constricting girdle sensation" became well defined a short distance above the umbilicus, and both sensation and motion were completely lost below this cincture. An unpleasant and annoying sensation to the patient was a feeling of distortion and twisting of the lower extremities, so that at times the feet seemed close to her face. Several times she asked to have the feet lifted into view, that she might dispel all doubts and convince herself that the sensation was a delusion. Œdema gradually de-

[1] Roberts mentions "certain cases of chronic disease of the spinal cord," as one of the causes of tympanites, and says he has seen a marked example.—"Quain's Dic. of Med.," Art. TYMPANITES.

veloped in the lower extremities. Later the left arm showed a considerable diminution of power.

Toward the last she suffered occasional pains in the intercostal spaces, back of the neck, and back of the head. The same inability to be moved continued. For five months she lay horizontally upon her back, and was only moved when necessary, and then with the most tender care. She seldom took anodynes during her illness.

The temperature ranged from normal to 101°,—rarely, however, going above 99½°. Her appetite and digestion remained quite good, and but slight alteration of nutrition took place. Only one small bedsore formed, and that a few days before her death. During the last two or three weeks, mucous râles could be heard at the top of both lungs. The pulse was but slightly accelerated until about one month preceding her death when it became more frequent. Occasional intermittency was perceptible. Her mind was clear throughout her entire illness until within twenty minutes of her death, which occurred on the afternoon of Dec. 2d. Early in the morning of this day she experienced much difficulty from mucous râles in the upper air-passages, and this increased her dyspnœa. Hope buoyed her up, and a ruling desire to again enjoy her Washington home, combined with an indomitable will, did much to stimulate her failing powers and prolong her life.

Several hours after death I was permitted to examine the condition of the spine and remove portions of the vertebræ for examination. The prominence over the eighth and ninth dorsal vertebræ was not so well marked as I had anticipated. When I cut down to those vertebræ, which were the only ones examined, I noticed no striking changes. I considered the bones, possibly, slightly softened. The portions removed were sent to Dr. Charles K. Mills, of Philadelphia, who, with Dr. J. H. C. Simes, of the same city, kindly examined the specimen for me. A note from Dr. Mills informs me that the examination revealed *alveolar sarcoma*.

The following report on the microscopical appearances has been furnished by Dr. Simes:

The histological structure of the neoplasm sent to me for examination consists of cells, both spindle and round in shape, having a lymphoid type, and their arrangement is such that the spindle-shaped cells are placed to form trabeculæ, which trabeculæ form the walls of alveolar spaces, and the round cells are seen within these spaces. Such an arrangement constitutes an alveolar sarcoma. A distinction between a carcinoma and sarcoma is one of histogenesis; the former being of epithelial origin, and the latter from the connective-tissue group.

HYSTERICAL ACCUSATIONS: AN ANALYSIS OF THE EMMA BOND CASE.

By JAMES G. KIERNAN, M.D., Chicago, Ill.

MEDICAL SUPERINTENDENT COOK COUNTY HOSPITAL FOR THE INSANE.

HYSTERICAL accusations against physicians are so far from being infrequent, that a recent little poem in *Punch* speaks of living hysterical scandals "down" in a way which denotes that such scandals are a necessary concomitant of a medical man's life. That laymen should also suffer from such scandals is to be expected, although from the circumstances of the case they do not suffer as frequently as physicians. The recently decided well-known case of Emma Bond seemed to me one of this character, and I have thought the same of sufficient importance to merit analysis. The *British Medical Journal* says: "Recent circumstances, in the case of Lady Florence Dixie, have directed attention to certain remarkable delusions to which females of unstable nervous equilibrium are subject, either through hysteria or through similar disorders of the nervous system. Charcot and Bourneville give instances of the extraordinary self-deceptions that are frequent among hysterical patients. Dr. Legrand du Saulle, physician to the Salpêtrière, Paris, describes ('Les Hystériques'[1]) some remarkable cases of delusions, where females labored under the belief that they had been struck or stabbed by others, even after having inflicted blows and wounds upon themselves. In one instance a young woman was found by her husband lying on the floor of her room in a fainting-fit, her

[1] Volume i., 1883.

face covered with blood. On reviving from her swoon she stated that she had been attacked by armed men; the Paris newspapers related the case, and within three weeks two similar events occurred in the French metropolis. All these cases proved to be fabricated by the supposed victims. A young girl wounded herself slightly with a pistol. She gave the police authorities the most minute details about an imaginary assassin, who, according to her account, fired the weapon, but she was found to be highly hysterical, and it was proved that she had wilfully wounded herself. In a third case in Dr. du Saulle's experience, a young woman was found in a railway carriage, stabbed in the left side. The incident caused great excitement, but it was proved, contrary to her assertions, that she had inflicted the wound herself, and was a hysterical subject. A housemaid was found lying behind a door, bound, gagged, and covered with bruises. She stated that she had been brutally attacked by two burglars with blackened faces, but she was a highly hysterical woman, and there appears to have been strong evidence that she had contrived to tie her own hands, and to gag and bruise herself. Perhaps the strangest case of all occurred in M. Tardieu's practice. A young lady, living at Courbevoie, wished to make herself an object of public interest by passing as a victim of a political conspiracy, which she pretended to have discovered. One night she was found in a state of the greatest mental perturbation at the door of her apartment. She could not talk, but stated in writing that she had been attacked outside her own house by a man, who had attempted to garrote her, at the same time striking her twice with a dagger. Only the lady's clothing was injured, and the body of her dress and her corset were found to be cut through, but at different levels. She tried to make out that the attempt at strangulation had caused dumbness. M. Tardieu remarked in her hearing that this infirmity rapidly disappeared when produced under circumstances of this kind. She soon managed to regain her speech, and in a short time admitted that the whole narrative had been evolved out of her inner consciousness. Eccentricity in relatives is ever strongly presumptive of

self-deception when a female makes any statement or charges of any kind. The constant fear of assassination, especially if based on reasonable grounds, is particularly liable to predispose nervous or excitable subjects to extraordinary delusions of this kind."

These accusations, however, have sometimes very serious results. In a case reported by Legrand du Saulle,[1] an hysterical female sent five persons to Cayenne (the French penal settlement) by accusing them of outrage. A member of the French Medico-Psychological Association suspected from an after examination of the alleged victim that the whole story was of hysterical origin, and through his efforts the innocence of the prisoners at Cayenne was demonstrated, and they were released from their unmerited confinement.

Toulmouche[2] has reported the case of a young girl given to devotional exercises and much inclined to flagellation and asceticism. She one day cut herself with a pair of scissors 600 times on various parts of the body. She asserted these wounds were made by a man who tried to outrage her. She finally confessed that the injuries were all self-inflicted.

Huchard[3] has had under observation an eighteen-year-old girl who accused the vicar of the parish of having raped her. She stated that one day while she was praying in the church the vicar shut all the doors and requested her to go with him into the sacristy. There, she said, he made obscene proposals to her and as she indignantly refused he pointed a dagger at her; she fainted, and during the faint he (she alleged) violated her. She was questioned during the trial, and her replies to the questions of the medical experts exciting suspicion, an examination was ordered by the court which showed that she had never been violated and was still a virgin.

Tardieu[4] has had under observation the case of an inmate of a Gascony convent who claimed to have been made the victim of all sorts of outrages therein. Her father, with full faith in what she said, denounced the alleged criminals.

[1] "Les Hystériques."

[2] *Annales d'Hygiène Publique*, série i, tome i., 1853.

[3] *Archives de Neurologie*, March to April, 1882.

[4] "Étude Médico-légale sur la Folie."

Finding, however, that his daughter's story was untrue, he took his life. In another case cited by Tardieu a girl charged two young men with having violated her person and introduced into her rectum and vagina, stones, pieces of wood and iron, which had to be extracted with great pain. She had convulsive seizures followed by paralysis. The two young men were convicted, and had been imprisoned for more than a year when the false nature of the accusation was discovered.

Hammond [1] reports the case of a twenty-two-year-old girl who carried on a systematic course of deception for several months, and not only greatly injured an excellent young man but damaged her own character to such an extent that her family were compelled to move away from the place in which they were living. In this instance the patient, by wearing pads over her abdomen and gradually increasing their thickness, led to inquiry from her mother and suspicions that an abdominal tumor existed. It was decided to consult an eminent gynecologist, when the girl, with tears, lamentations, and self-reproaches, confessed that she was pregnant. Of course the distress in the family was very great, and a great deal of anger was exhibited toward the supposed miscreant who had ruined a virtuous woman. For a long time she refused to reveal the name of her seducer; but finally one morning she came down stairs with a letter she had written to her father in which a full (but false) revelation of all the circumstances was made. In this letter she declared that a gentleman they all knew and respected was the seducer. Arrangements for her confinement were made in a distant city and at the same time it was resolved by her parents to arrange, if possible, a marriage with the alleged destroyer of their daughter's honor. The father, accordingly, had an interview, at which the gentleman was offered the alternative of immediate marriage or instant death. Denials and protestations were useless He consented to the marriage, but only on condition that he should be granted an interview with the lady in presence of her parents. This was agreed to. A meeting took place at once, and the gentleman, who was

[1] "Treatise on Insanity."

a lawyer, succeeded by his tact and directness of his questions in exposing the fraud and obtaining a full confession.

It will be obvious that hysterical females are capable of deceiving a whole community. On examining the evidence in the Bond case it is found that the first accusation made was vague and indefinite, and that only as suspicion pointed to certain persons did the charges of Miss Bond become direct and positive. Her testimony as a whole was so contradictory that the jury threw it out of consideration. The prosecution failed to place the physicians, who examined Miss Bond after the alleged outrage, upon the stand. The defence claimed that they had the right to cross-examine these physicians, but this claim was not allowed. Turning to the family history, it is found that there are insane and eccentric members in the Bond family; it is also to be noted that, during the period between the time of the alleged outrage and the trial, whenever public interest in the case began to abate, Miss Bond had hysterical convulsions, and was on the "point of death" so frequently that the newspapers commented on her tenacity of life. It is also to be noted that Miss Bond had herself photographed, and this photograph sold to defray the expenses of the prosecution; her only claim to public notice being the fact that she was outraged. Taking into account the indefinite and contradictory nature of Miss Bond's earlier accusations, her craving for public notice as shown in her sale of her photographs, her convenient hysterical convulsive attacks at periods when interest in the case was abating, the significant non-use of medical testimony by the prosecution, the existence of neurotic relatives, but one conclusion can be drawn: the whole charge was the product of a diseased brain which imposed on a scandal-loving community. The jury who found the prisoners innocent in the face of public clamor are to be congratulated on their intelligence and sense of justice. Had they had less firmness the story would have been the same as that which recently drove Dr. Edwardes to suicide; the same inconsistent mob, which gloated over his alleged crime, drove the poor hysterical female, whose delusion gulled them through their tendency

to believe scandal, from the town on discovering the unjust nature of the accusation. Hysterical girls who make these accusations are not responsible for them, but the scandal-loving people who support them in these should be held pecuniarily responsible. But for the good sense of a physician in Indiana there would have been a repetition of the Bond case there; a girl made like accusations, but he showed that these were of purely hysterical origin. It is to be regretted that Miss Bond did not fall into the hands of a similar sensible physician soon after the alleged outrage. In that case this poor girl's affliction would not have been made the property of the public.

ON THE USE OF THE ABSOLUTE GALVANOMETER, WITH DESCRIPION OF HIRSCHMANN'S NEW INSTRUMENT.*

By B. SACHS, M.D., New York.

(*With one wood-cut.*)

THE introduction of a unit of current strength into medical electricity has been generally approved of in England, Germany, and France. In Germany, Bernhard[1] Eulenburg,[2] and Erb[3] have, for the past few years, insisted on the necessity of establishing a standard of electrical measurement, while the progress which has been made in this direction in England and France is due chiefly to the warm advocacy of De Watteville in London, and the persistent efforts of Gaiffe in Paris. Strangely enough the question has not received the consideration it deserves at the hands of American physicians.

That much good work has been done in electro-therapeutics by neurologists of this country no one will dispute. The more reason, therefore, why they should adopt a method which will enable them to apply electricity, or at least the galvanic current, with scientific accuracy.

The disadvantages of the old, or rather, the present method of gauging the quantity of electric force employed in any one case must be apparent to all who are in the habit of using electricity either for therapeutic or diagnostic

* Read in substance before the New York Neurological Society, Jan. 6, 1885.

[1] Rosenthal u. Bernhardt "Electrizitätslehre," &c., Berlin, 1884.

[2] *Deutsche Med. Wochenschrift*, Feb. 21, 1884.

[3] Erb "Elektrotherapie," Leipzig, 1882.

purposes. To say that we have used the electromotive force of a certain number of cells gives but an imperfect idea of the actual current yielded ; for the capacity of the cells, not only of a different, but of one and the same battery, varies greatly, and that too from day to day. To add the number of degrees to which an ordinary galvanometer needle was deflected, and the units of resistance which were introduced, does not improve matters much ; for the deflection of the ordinary magnetic needle does not remain proportional to the strength of current employed, and with two variable factors in the calculation, a third, more positive one, loses much of its value. The physician who observes his galvanometer, rheostat, and battery from day to day may form a relative estimate of the amount of electricity used in one instance or the other, but he cannot represent the strength of this current to himself and others in terms of an intelligible unit.

Hitherto we have been groping in the dark ; we have employed a powerful therapeutic agent without troubling ourselves much about its dosage. Those who do not insist on absolute accuracy at all times might argue that much good and little harm were done under the old régime ; that the subjective sensations of the patient are a sufficient guide for the physician ; that the patient will be prompt enough in letting the physician know when he is administering too much. Granting the reliability of the patient, I would reply that from the therapeutic point of view, a very weak current may be as injurious as a very strong one. But it is not so much a question of doing right or wrong ; it is a question of doing work accurately or shiftlessly ; of knowing exactly what one is about, or of leaving every thing to chance. Few seem to realize that we should apply electricity with the same care with which we administer any potent therapeutical agent.

Whether such great accuracy and care in treatment be necessary or not, may be left to the judgment of the individual. For the purposes of electrical diagnosis, however, there is little doubt of the advantages which an instrument indicating the strength of the galvanic current

passing through the body in terms of a known unit would possess over our present imperfect means of registering this amount. With the use of an absolute galvanometer, we shall soon gain some definite conception of the current strength required to produce, say, kathodic closure contraction of any nerve or muscle, and to compare with this figure the current strength required to excite the same nerve or muscle under pathological conditions. In passing I will add that tables, stating the normal limits between which the various contractions take place, have been formulated by Eulenburg,[1] Weiss,[2] and others. Having once accustomed ourselves to these units of measurment, we shall ever afterwards speak and write of electrical quantities in terms intelligible to all.

The question is: Which unit to employ? Fortunately for us, there is little room for discussion on this head. Not being the leaders in this movement, we can do no better than to follow suit. Some years ago De Watteville proposed the milliampère as a standard of measurement. The same unit, though at first employed under another name, the milliweber, has been adopted by German investigators, and the instrument which I shall describe later on is graduated in accordance with this unit.

It is quite probable that for the nonce the French will come to terms with the English and German neurologists, and will adopt the same standard. What we should do seems evident enough; but on this subject it is your privilege to legislate. Here tradition is not the stumbling-block it has proved to be in the adoption of an international standard of weights and measures. We have simply to

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[1] *Loc cit.*

Here are a few extracts from Eulenburg's tables:

Current strength required to produce first KCC:

Facial nerve	(Trunk)	in 24 cases		0,6—2,0 M.-A.
" "	(Branches)	" 9	"	0,5—1,5
Median "	(Upper Arm)	" 4	"	0,7—1,2
Ulnar "	(Elbow)	" 10	"	0,4—0,8

Similar tables should be constructed giving the limits between which ACC, AOC, and KOC, may occur in the normal. Much loose talk regarding reaction of degeneration, etc., would cease if we required the exact strength of current to be registered at which the various forms of contraction were observed.

[2] *Centralblatt für die gesammte Therapie*, Jan., 1883, p. 11.

consider whether the unit of measurement adopted in other countries is the most practicable ; if so, we are bound to make this unit our own. It has been abundantly shown that a milliampère and its multiples correspond quite accurately to the quantity of electricity generally employed for purposes of treatment or diagnosis. With the average resistance of the human body the current of 10, 20, 30, or Daniell would aggregate to 5, 10, or 20 milliampères.

I have said that the milliampères was proposed and approved of as a unit of measurement some years ago; but until quite recently we possessed no entirely satisfactory absolute galvanometers. The difficulties encountered in the construction of these instruments seemed almost insuperable.

In 1873, Gaiffe constructed a horizontal absolute galvanometer, which he graduated according to ten-thousandths of a unit of intensity; later on he was persuaded to exchange this clumsy and rather unintelligible subdivision for a division into milliampères. To this instrument there was the one serious objection which must be urged against all horizontal galvanometers. The deflection of a horizontal needle varies with the difference of magnetic force at various points of the earth's surface. A current causing a deflection of 10 degrees, observed in Paris, would not be equivalent to the current producing a similar deflection in New York or London. Gaiffe's galvanometer, moreover, was found to be unreliable and not sensitive enough; De Watteville[1] alone, who makes no mention of any other absolute galvanometers, is enthusiastic in praise of this instrument. Similar galvanometers were constructed in the latter half of the last decade and the beginning of this by Böttcher and Stöhrer, and by Edelmann of Munich.

In Edelmann's galvanometer, which was graduated according to milliampères, a bell-shaped magnet was employed and suspended by a short silk thread. This mechanism reduced the number of oscillations, but at the same time rendered the instrument almost too delicate for use. A small pocket galvanometer which Edelmann invented would be

[1] De Watteville : "Med. Electricity," 2d edit., 1884.

more practicable if the needle were not open to the objections urged above against all horizontal galvanometers. Böttcher and Stöhrer, as well as Hirschmann, profiting by these imperfect efforts, constructed *vertical* galvanometers, which they supposed would be entirely independent of terrestrial magnetism. Much to their surprise it was proved by Müller,[1] of Wiesbaden, that the ordinary vertically suspended needle was subject to the same disturbing influence, though not to as marked a degree as the horizontal galvanometers. To counteract the influence of the magnetic force of the earth Hirschmann finally set out to construct a *vertical absolute* galvanometer, and of using not a single needle but a pair of astatic needles.

In the light of past experiences and our present needs, we may insist that an entirely satisfactory galvanometer must meet the following requirements: The instrument must indicate the exact strength of current passing through the body; and any deflection of the needle must be equivalent to the same quantity of electricity the world over. We have seen that this can be best effected by the use of astatic needles. The instrument must be sensitive enough to indicate the passing of a current through any part of the body before the patient perceives the current. The needle must come to rest quickly after the current is broken. The instrument must be substantial in structure; and, lastly, must permit of an easy adjustment to all batteries, stationary and portable. All these conditions are fulfilled, with perhaps one or two exceptions, by the instrument before you.

Now as to the notable features of this absolute galvanometer.

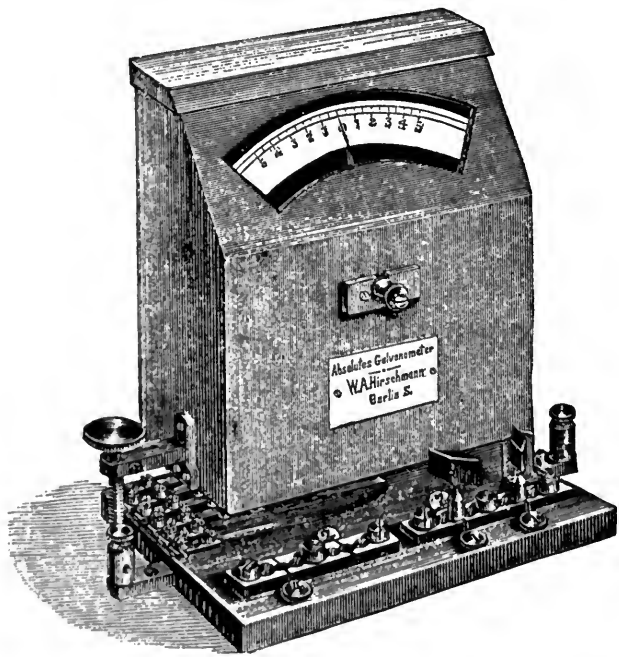
The annexed figure represents as much of Hirschmann's galvanometer as is visible without removing the wooden box (7½ in. high) in which the instrument is enclosed. Its distinguishing feature—the use of a pair of vertically adjusted astatic needles—was referred to above.

The two needles have a common axis. The posterior needle swings between two coils of insulated wire; the anterior needle swings in front of these coils, and carries the indi-

[1] Müller: "Zur Einleitung in die Elektrotherapie." Wiesbaden, 1885.

cator at its upper end. The indicator and scale are visible through the aperture in the upper part of the box. The scale, which is drawn (by hand) on an arc, is subdivided into ten equal parts on each side of the median line. The whole scale indicates 5 milliampères; each line denoting $\frac{1}{2}$ M.-A. The proportions of this scale are such that a variation of $\frac{1}{8}$ M.-A. could easily be noted.

This is an important point to remember when comparing this instrument with others. We must be able not only to



detect slight variations in the deflection of the needle, but also to read the scale at some distance from the table on which it stands.

In order to retain a scale of such liberal dimensions, without increasing the size of the instrument, Hirschmann introduced "shunts," which are situated in the corners of the box, at a safe distance from the main coils.

If the plugs be inserted at 1, 1, the whole of the current passes through the galvanometer proper, and the strength

of current is exactly that indicated on the scale. If the plugs be inserted at 2, 2, the current is divided, one half passing through the main coils and the other half through a shunt, offering precisely the same resistance to the current that the main coil does. The strength of the current, therefore, is double that indicated on the scale. If one plug be removed and the other inserted at 4, but one fourth of the whole current need pass through the galvanometer proper, since a shunt of one third the resistance of the main coil has been introduced into the circuit. The actual strength of current will be four times that denoted on the scale. In this way we are enabled to measure currents varying in intensity from one half to twenty milliampères.[1]

As is seen in the figure, the instrument is firmly fixed on the right side, while it rests upon springs and a movable screw on the left. By turning this screw up or down the instrument is made to stand level, and the needle is kept at zero. On either side of the instrument are the binding screws, by means of which the instrument is connected with the battery. The resistance of the galvanometer is equivalent to 500 Siemens' unities, or 471 Ohms. This resistance does not vary with the introduction of the shunts into the circuit, for if the connections 2, 2, or 4 be made, resistances of 250 and 125 S. unities are respectively added to the resistance of the main coil.

After a year's experience with this instrument, I am prepared to say that it has done me excellent service.

I know of but two possible objections to this galvanometer. The one is that it does not bear transportation well, and the other that the return of the needle to the zero point is (very) slightly impeded by the action of friction. Others who have used the instrument have been disturbed by the oscillations of the needle. These are excessive only in case a current of great strength is suddenly broken. The number of oscillations is held in check by a metal damper surrounding the posterior needle.

I have given a detailed description of this absolute galvanometer in order to do justice to the ingenuity of its in-

[1] With ordinary electrodes, currents of greater strength are seldom employed.

ventor, and to acquaint the reader with the happy manner in which the problems of galvanometer construction have been solved. I cannot, and do not, expect neurologists of this country to use Hirschmann's instrument to the exclusion of all others; but with the peculiar merits of this instrument before them, they will be able to gauge the merits of any other instrument which may be brought to their notice. Let our electricians and instrument-makers try their own skill in this work, but let them profit also by the experience of their European colleagues.

NOTE.—Since writing the above, Mr. John A. Barrett, of this city, has shown me an absolute galvanometer which he constructed at the request of a well-known physician. When a few modifications shall have been made, the instrument will probably meet all the demands detailed above.

EPILEPSY.*

By L. W. BAKER, M. D.,

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IN this disease the autopsy and the microscope have afforded us but little satisfaction. There seems to be no fixed and constant pathological lesion attendant upon the wide assemblage of symptoms classified under the name of epilepsy. The few histological changes which have been reported are, it seems to me, to be considered results rather than causes of the disturbance.

But if our knowledge concerning the actual pathological changes occurring in epilepsy is vague and unsatisfactory, experiment and clinical observations have yielded most valuable results. The researches of Ferrier, Hitzig, and Luys concerning the functions of the brain have been rich in suggestion, while the labors of J. Hughlings-Jackson, Gowers, and others have, within a few years, furnished us with a more satisfactory explanation of the phenomena of this disease than any we have heretofore possessed.

According to the views of these observers, an epileptic paroxysm arises from a sudden and excessive functional activity of the gray matter in some portion of the brain. This rapid action of certain nerve centres, with its resulting phenomena, is called a "discharge," which may commence in any part of the gray matter of the brain, remain confined to the portion in which it originated, or may extend to and involve other portions; hence the wide variety of manifestations which constitute an attack. There may be, for example, a momentary loss of consciousness, a slight incoherence, or

* Read before the New England Psychological Society, Dec. 9, 1884.

mental blank, without muscular spasm, or the attacks may be of a convulsive character, involving few or many muscles; auræ of the greatest variety may be present, or the patient may have no warning whatever of an approaching seizure, while not infrequently the attacks are preceded or followed by more or less mental excitement. Dr. Jackson even goes so far as to say that "epilepsy is not a particular grouping of symptoms occurring occasionally; it is a name for any sort of nervous symptoms or group of symptoms occurring occasionally from local discharges; whether the discharge puts muscles in movement or not—that is, whether there be a convulsion or not,—matters nothing for the definition. A paroxysm of subjective sensation of smell is an epilepsy as much as is a paroxysm of convulsions; each is the result of sudden local discharge of gray matter."

This rapid liberation of energy in the nervous centres, giving rise to an epileptic paroxysm, may be due either to a sudden diminution of inhibitory power, or to an excessive and rapid generation of nerve force within the cells affected. It is, however, important to remember, that the primary and essential element in the production of a "discharge" is the presence of an inherent instability of certain portions of the gray matter within the encephalon, which may be due to heredity or other predisposing causes, some of which are beyond our power of detection; just what constitutes this instability we are unable to say, but some form of impaired nutrition probably plays an important part in its production. "The real cause of the disease," says Gowers, "is the morbid state of the nervous system, the existence of which is only revealed by the immediate excitant of the first fit. Nevertheless, since the occurrence of one fit undoubtedly facilitates the occurrence of others, we must regard the excitant of the first fit as, to some extent, the cause of the other fits—*i. e.*, of the whole developed disease. Without that cause, the disease might have remained for ever latent."

The fundamental element in the production of convulsive disorders is an unstable condition of certain cerebral areas, which may be induced or maintained by various causes, and which varies greatly in different individuals. The feeble

powers of control possessed by the brain during childhood, and which is influenced more or less by heredity, explains the readiness with which convulsive attacks are induced during this period of life from comparatively trivial exciting causes. These attacks, if allowed to continue, are liable to develop later into confirmed epilepsy. Bearing in mind, then, the instability of certain cerebral cells as the primary cause of the paroxysm, we can understand that an epileptic or epileptiform seizure is induced by various exciting causes. These have been classified by Reynolds as: 1. Pyschical—such as fright, grief, worry, or overwork. 2. Eccentric irritation—dentition, indigestion, dysentery, etc. 3. General organic changes—fatigue, pregnancy, miscarriages, rheumatic fever, scarlet-fever, diphtheria, pneumonia. 4. Physical influences—blows on the head, falls, cuts.

In many instances no exciting cause can be detected, and in all cases of chronic convulsive disease it is important to discriminate, if possible, between those cases in which the attacks are symptomatic, the result of some organic lesion or traumatism, either central or eccentric, and those cases which are simply the manifestation of a morbid constitution of the brain unaccompanied by any anatomical change. In the first instance, the attacks may resemble epilepsy; they may be epileptiform, but they are not epileptic. It would, I think, be a great advantage if the term epilepsy could be limited to those cases in which the disease is a pure neurosis. This, however, is not always possible to do.

The symptoms of epilepsy are, as you well know, usually classified into two divisions, according to their degree of severity: the major attacks, characterized by loss of consciousness and severe muscular spasm; and the minor form, in which there is nearly always loss of consciousness, with or without slight spasm. Between these two types of the disease there may be a very great variety of symptoms. In many instances the attacks are preceded by an aura which is usually referred to the periphery, and which was formerly considered an excitant of the epileptic paroxysm. In the vast majority of cases, however, the aura is now considered to be the first manifestation of the discharge,

which may be followed by other characteristic phenomena. Occasionally the aura is the only manifestation of an attack, the paroxysm being arrested before it is fully developed. By considering the mode of commencement of an attack we may gain valuable information concerning the region of the brain which is first affected by the discharge.

In certain cases a constantly acting peripheral irritation may induce a convulsive habit in the brain centres, which may even continue after the removal of the exciting cause. Yet this irritation has no necessary and constant relation to the phenomena which constitute the discharge. Uterine or ovarian disease, for example, may, in an unstable nervous organism, induce an epileptiform attack, the aura of which may be disordered vision or a sensation referred to the right arm. Here the exciting cause evidently resides in the uterus or ovaries. The manifestations of the discharge, however, are referred to another portion of the body. An aura indicates the commencement of an epileptic attack; it is not the cause of the paroxysm.

One of the saddest features of this disease is the mental deterioration or derangement which is frequently found associated with it. The tendency to mental failure is greatest in those cases which commence in early childhood, and it is also more or less influenced by the duration of the disease. "When epilepsy has lasted a long time," remarks Boileau de Castelnau, "one must expect to see it ending in enfeeblement of the intelligence and of mobility. The younger the individual at the commencement of epilepsy, the more mental alienation is to be dreaded." "Mental failure," says Ecchiverria, "has been evident in 374 of the 532 epileptics whose history I have analyzed, or in 70.3 %. Of this latter number 26 % exhibited attacks of mania lasting from a few minutes to several days or weeks. One hundred and thirty-three, or a little over one fourth of the whole number, were subject to periodical fits of cerebral or larvated epilepsy, alternating with or supplementing the convulsive attacks." These sudden attacks of mania occurring in an epileptic, and during which he may do violence to others, are of very

great medico-legal importance, for many terrible crimes have been committed, and many strange and otherwise unaccountable acts performed, by persons suffering from this form of periodical insanity.

The exhibitions of mental derangement may precede or follow an epileptic seizure; they may also take the place of an attack. In this event the discharge is mental rather than motor; there is a convulsion of ideas rather than a convulsion of muscles.

"The sudden maniacal paroxysm in an epileptic case," says Gray, "is often merely a substitute for a fit," and yet it is not impossible that these attacks of mental epilepsy may have been preceded by a slight nocturnal attack, or by a scarcely noticeable minor seizure. For, remarks Ecchiverria: "How easily the silent nocturnal paroxysms are overlooked is as much illustrated by ordinary as by criminal cases. Their diagnosis therefore demands the nicest discrimination, for no kind of epilepsy is more liable than this to originate mental derangement with impulsive criminal acts. * * *

"The mental phenomena of maskedor cerebral epilepsy recur with the periodicity peculiar to the other epileptic paroxysms. They supervene after a more or less prolonged stage of incubation, and though acknowledging the same source and nature as the attacks which they substitute, they exhibit, however, a much longer duration, seldom lasting less than a day and often persisting for two or three."

One case which came under my observation exhibited the peculiarity of convulsions alternating with mental excitement in a marked degree, and I have now under treatment a young gentleman, eighteen years of age, who has had severe epileptic attacks since he was two years of age. When first I saw him, Feb. 9, 1884, he had on an average at least two attacks daily. Previous attempts at treatment had failed on account of the mental derangement which was sure to follow the cessation of the attacks. I placed him under suitable treatment, the attacks at once ceased, and he has been entirely free from them since March 26, 1884. Mental excitement, however, soon appeared, accompanied by sleeplessness and by the most violent exhibitions of

temper and intolerance of any attempts at control; the slightest irritation was sufficient to excite a paroxysm of noisy rage. Still adhering to the original plan of treatment, to allay the muscular convulsive tendency, which has been pursued without the omission of a single dose, I combined with it treatment intended to allay the tremendous mental convulsion under which he was suffering. A few months' perseverance on this line accomplished the desired result, and at the present time he has been entirely free from mental excitement for several months, eats and sleeps well, and performs his ordinary duties. This I believe is a well-marked case of mental epilepsy following the cessation of the convulsive attacks.

In regard to the treatment of epilepsy, I believe that the results are not so discouraging as some writers would have us suppose. There can be no question, however, that the earlier treatment can be commenced, the better the prognosis. It is also important to remember that treatment to be successful should be continued for a long time after the cessation of the attacks. Herein is where so many fail. Long freedom from attacks begets the opinion in the mind of the patient, that the disease is fully cured; the treatment is consequently discontinued, with the frequent result of allowing the seizures to return, and the ground must all be gone over again, with the added difficulty of controlling the epileptic tendency which has been permitted to again assert itself. The importance of long-continued treatment of this disease cannot be overestimated, and in the severer forms the best results will be accomplished if the patient can be cared for in an institution devoted especially to this class of cases, for in this way only can we secure the administration of the proper remedies with unfailing regularity, while at the same time we provide for the proper care of the patient, should he be subject to attacks of mental derangement. Unfortunately our present facilities for the care of this special class are not the best, for, as a rule, the only provision now made for epileptics is in hospitals for the insane, and as the classification in these institutions is generally made with refer-

ence to the patient's mental condition, rather than to the accompanying epilepsy, it is evident that an insane asylum is not the most suitable place for these cases. The insane ought never to witness the wild contortions and terrible struggles of an epileptic seizure, and it is also an injustice to confine an epileptic, who may be insane only during the paroxysms, with lunatics; for, during their freedom from attacks, these patients resent the companionship of the insane. For such cases needing asylum care, separate institutions should be provided.

Epilepsy is a distinct disease, and should be treated apart from hospitals for the insane.

But however desirable it may be that special institutions should be provided for the care and treatment of epileptics, many cases will still come under our observation for whom treatment must be provided outside of such institutions, and I desire here to protest against the opinion, held by many, that epilepsy is an incurable disease, and consequently that treatment is of little avail.

The results of my experience distinctly contradict this view. Many cases of epilepsy I believe are curable, while in many more the frequency as well as the severity of the attacks may be greatly diminished by suitable treatment; even if we accomplish nothing more than this, are we not doing a great deal for the comfort of our patients? Is not the habit of taking medicine, even for years, preferable to the continuance of the epileptic habit?

What form of treatment will remove an aortic obstruction, or restore lung tissue in the later stage of phthisis to a perfectly healthy condition? Yet who will maintain that in them, as well as in many other chronic affections, medical care is of no value.

Dr. Powers, of London, who has had a great experience in the treatment of epileptics, gives the results of his treatment in 562 cases. Of these the epileptic attacks ceased in 241 cases while under treatment. In 266 cases improvement short of arrest was obtained, the fits being reduced to $\frac{1}{20}$, $\frac{1}{30}$, $\frac{1}{50}$, and even to $\frac{1}{200}$ of their frequency and severity. In 55 cases but little or no improvement.

Dr. Hughes Bennett, physician to the Hospital for Epilepsy and Paralysis, Regent's Park, presented a report on the 7th of June, 1879, of 41 cases treated during the previous six months, which demonstrated the remarkable influence of treatment upon epileptic attacks. In 22 % the paroxysms were completely checked during the whole time of treatment. In 92 % the seizures were either entirely arrested during the observation, or greatly modified in frequency and severity.

Of the cases which have come under my own observation during the past two years, the results of treatment have been very satisfactory, either in securing complete arrest or in a diminution of the epileptic paroxysm.

The introduction of the bromides marks an epoch in the treatment of epilepsy, but the routine administration of these or any other remedies, without an intelligent study of the peculiarities of each case, will often result only in disappointment. Convulsive attacks, as we have already seen, may depend upon various exciting causes, which may be either central or eccentric in their origin. Not unfrequently the convulsion will be found to depend upon some irritation in the periphery, as a congenital phimosis, an injured nerve, or indigestion ; in this event, our attention must first be directed toward the removal of the exciting cause. Should the convulsion be central in its origin, it may depend upon a variety of causes, which must be separately investigated before the disease can be treated intelligently. "In no disease," says Dr. Pepper, "is routine less permissible, and in no disease is attention to hygienic and general influences more essential. In each case the treatment should be adapted to the special peculiarity: to the character of the primary cause, if such cause be discovered ; and to the character of the provoking cause, if it can be detected."

NEW YORK NEUROLOGICAL SOCIETY.

Stated Meeting, November 11, 1884.

W. J. MORTON, M.D., President, in the chair.

Dr. C. L. DANA read a paper on "Spinal Concussion and the Nature of its Sequelæ."

Dr. Dana summarized as follows:

1. That the term spinal concussion is a misleading and often incorrect one, and that the symptoms which are usually associated with that name are really symptoms of traumatic neurasthenia,[1] hysteria, and hypochondriasis, associated, more or less, with symptoms of injury to the vertebral ligaments and muscles, and to the spinal nerves; that, in other words, spinal concussion is mental shock and physical bruising.

2. That this traumatic neurasthenia is in a measure a real disease, though it is very hard to say how much is real and how much the patient puts on.

3. That it may be, and often is, simulated, and that it requires the greatest care to detect skilled impostors.

4. That we need more objective tests for the purpose of determining the existence of these subjective neuroses.

5. That the prognosis of railway or traumatic neurasthenia and hysteria is very good so far as steady improvement is concerned, not so good as regards complete recovery.

6. That concussion of the spinal *cord* alone, followed by temporary loss of function, or by myelitis, does occur in rare instances.

[1] The term "traumatic neurasthenia" covers a well-recognized symptom-complex which, in some cases, includes a lithæmic condition produced by active, healthy persons being suddenly obliged to lead a sedentary life.

7. That, in the predisposed at least, injuries and jars may set up chronic myelitis, without there being a lesion of the spinal column.

8. That Mr. Erichsen has in his book on "Spinal Concussion" erroneously attributed functional troubles to the results of organic spinal disease.

9. That Mr. Erichsen's book on "Spinal Concussion" has a strong tendency erroneously to attribute to a shaking of the spine and a supposed ensuing meningitis, symptoms really due to mental shock, peripheral injury, or malingering.

The accompanying table was also given.

Dr. W. A. HAMMOND said: I agree with Dr. Dana in the view that there is such a thing as concussion of the spinal cord. I agree with him further in the doctrine that it is difficult for us to tell by the symptoms what the exact nature of the injury is that the patient has suffered. But this fact, I think, remains, that there is some injury which the spinal cord is capable of suffering, which is not of such a serious character as to cause death, and which is not accompanied by any injury to the bones, or to the muscles or ligaments. That after all is the practical point.

Dr. Hammond then related the history of two cases of spinal concussion in which he had been called as an expert. The first patient suffered from muscular weakness, spinal pains, severe general nervous symptoms, and walked with a peculiar paralytic gait. There was no positive evidence of organic disease of the spinal cord. He received large damages, but he still, twenty years later, suffers from his trouble. The second case, of a somewhat similar character, made a better recovery, but still walks with a cane. Dr. Hammond thought that this patient suffered from some organic disease of the cord.

The speaker referred to the first case which occurred in this country in which a post-mortem was made. The patient was a physician, who fell on the ice and suffered from the symptoms of antero-lateral sclerosis. On post-mortem, sclerotic patches were found throughout the spinal cord. I think traumatism may give rise to spinal affections without

Nature of injury.	Pathological change produced.	Symptoms.	Result.
Severe blow, fall, or shake.	Fracture or dislocation of vertebræ; compression or crush of cord; perhaps a hemorrhage in spinal cord or canal.	Immediate paralysis or paresis of limbs and spinal centres; anæsthesia; reflexes abolished.	Death occurring soon. Slow improvement, with symptoms of severe organic disease.
Severe blow, fall, or shake.	True concussion of spine (very rare); spinal contusion (very rare); spinal hemorrhage (not uncommon). With above are some injuries to ligaments and muscle, perhaps concealed fracture or dislocation; injury of nerves.	Temporary paresis or paralysis lasting one to six weeks; gradual recovery, spinal pains, symptoms of nervous shock.	Steady improvement and gradual recovery (the rule). With or without a preliminary period of comparative health or temporary improvement, symptoms of traumatic neurasthenia, hysteria (less often), or hypochondriasis, litigation symptoms appear (improvement and cure the rule). In very rare cases meningo-myelitis, insanity, epilepsy, inebriety, diabetes result.
Slight blow, fall, or shake.	More or less bruising, strain, or rupture of muscle and ligaments; some injury of nerves.	Sometimes a temporary paralysis (psychical); symptoms of general nervous shock or of concussion of brain; pains, stiffness, impaired gait.	After a period of comparative health symptoms of chronic meningitis or of chronic myelitis (tabes, lateral sclerosis) develop (very rare and only in the predisposed), traumatic hysteria, or neurasthenia. Gradual improvement the rule, and perfect cure the exception.

there being any palpable lesion of the soft parts, or of the bony structures, or the ligaments.

Only a few days ago I was called to the upper part of the city to see the case of a woman who had fallen through a dumb-waiter, a fire-escape, or something of that sort, which barely allowed her to pass in a doubled-up form. She fell a distance of thirty-five feet, by measurement, into the cellar, striking on her buttocks upon the hard ground. There was no fracture. Three months after the occurrence of the injury I saw her. She was still suffering from paraplegia, and incontinence of urine, and paralysis. Hypochondriasis and hysteria had also developed to an extreme degree. Yet she is rapidly recovering. I do not think there was any hemorrhage in her case, because I do not think hemorrhages of the spinal cord are recovered from. She suffered not only from motor troubles, but from sensory disturbances likewise; also from atrophy of her limbs, showing that the injury involved the whole segment of the cord, both the sensory and motor parts. Yet she has recovered, and I do not believe, therefore, that in her case there was any destruction of the cord. I cannot conceive that there could have been any thing else than a concussion.

Now, I would like to know what it is that happens sometimes when patients lift heavy weights and they feel something give way in the back, and after that they lose the use of their limbs, gradually waste away, and become paralyzed. I have seen such cases. I remember one which came under my observation some years ago, where the patient, endeavoring to lift a heavy window, got his hand in place and lifted with all his might, and suddenly felt something give way in his side. There was no injury there that could be detected by an examination; there was no fracture; no dislocation. And yet that patient gradually lost the use of his legs. What was that? Probably a rupture of some of the fibres of the cord or of the membranes of the cord; certainly an injury to the cord and not of the bony structures about it.

I cannot conceive of the possibility of getting rid of these facts: that the spinal cord is capable of suffering injury,

without there being any detectable lesion of the soft parts, or of the bones, or of the ligaments, or inter-vertebral substance; and that the trouble inside of the spinal canal involves the spinal cord.

Dr. CORNING related the history of a case in which partial impotency persisted long after the accident, and in which there were marked suicidal tendencies. There was not a trace of external injury.

Dr. ROCKWELL considered that organic or structural conditions seldom followed concussion of the spinal cord. Notwithstanding the fact that at the present time he had under his care a young person who was suffering from typical myelitis, ascribed to a severe fall followed at once by incomplete paraplegia, which had gone on to complete paraplegia, it seemed almost incredible to him that a person could have severe concussion of the spine without the cerebro-spinal system in its entirety being involved. In concussion there seldom could be a rupture of the vessels or nerve-fibres without causing death. The majority of cases of concussion that had come under his observation had presented symptoms as manifold almost as those of neurasthenia. The prognosis was generally good, and the best remedy time. The concussion that follows the blow of a bullet was frequently observed during our war.

Dr. HAMMOND added a case of railway injury, in which there was no lesion whatever of the external parts apparent; but there were occular disturbances (which he thinks are rare, as Dr. Dana says). The patient had double vision, congestive disks, bird vision, and suffered from the symptoms of neuro-retinitis, but they eventually disappeared. He had marked paralysis of the nerve on one side. He was injured in the upper part of the cord; suffered from loss of power in the arms and legs. Had head symptoms, was hypochondriacal and hysterical. He recovered a very large sum from the railway company.

Dr. WEBER remarked that from what he had seen and read upon the subject, it seemed to him that Page was certainly stealing a march upon Erichsen with regard to the views which Erichsen entertains. As I said in a paper read

before this Society upon another subject, the more we shall get into the habit of including a thorough examination of the cord and its meninges in post-mortem, the more our knowledge upon the demonstrable lesions will increase, and the less we shall hear in the course of time of concussion of the spine. I do not mean to say that there is no such thing as concussion of the spine, but I believe that a good many cases which are considered as such are not (in spite of the symptoms pointing that way) dependent upon concussion of the spine, but upon concussion of the brain. Now, the case which has been related by Dr. Hammond, of the woman falling down a dumb-waiter, thirty-five feet, and striking upon her buttocks—taking it for granted that there was a complete absence of all injury to the soft parts and to the ligaments and bones, as Dr. Hammond stated—is a case more of concussion of the brain than of concussion of the spine.

Dr. HAMMOND: To this I can only say that there was no cerebral symptom—that was my understanding—in the early part of the disease.

Dr. WEBER: There may have been, though.

Dr. HAMMOND: I understand not. She never lost consciousness for a moment. I cannot conceive of concussion of the brain without loss of consciousness.

Dr. WEBER: In an abstract of a large number of papers that I read recently, in a volume of Virchow-Hirsch's *Jahresbericht*, I found that most of the leading physicians abroad believe that many cases of so-called concussion of the spine, without any injury to the soft parts or the bones, really depend upon concussion of the brain. Some years ago I saw, at the St. Francis Hospital, a case precisely like the one related by Dr. Hammond. It concerned a young man who had been trying, on a wager with some other man, to lift heavier and heavier weights. While still straining he suddenly felt something give way in his back. He fell down and lost the use of his limbs. When I saw him, two weeks after the accident, there was paraplegia of the lower limbs, and a paralytic condition of the bladder. He remained in the hospital for a time, and, failing to improve, he was at length

discharged. I look upon this case as one of apoplexy of the spinal cord.

Dr. ROBERTS viewed the diversity of opinions as showing a manifest want of conception of fundamental ideas in regard to the subject. He considered the problem one of physics; dealing with a material object, and the forces acting upon it. Among the queries propounded occurs this one: Is it possible for the spinal cord to become concussed without injuring any of the hard parts of the vertebræ? Now, what is traumatism? What is concussion? The effect of blows upon hard, and upon soft or elastic, substances is very different. And we have every reason for believing that this effect differs upon the hard and soft parts of the human body; for the effects considered from the physical standpoint are the same, so far as the mechanical effects are concerned. Vibratory impulses, we find, are conveyed with much greater facility along a hard wooden beam than they are through the atmosphere. Now, if we saw the beam in two and interpose an elastic buffer, it will be found that the sound will not be transmitted; a physical barrier to the transmission of these impulses has been interposed. I may summarize two or three principles which underlie this problem by stating that the harder the substance and the more direct its continuity the greater is its conductivity to jars, to vibratory impulses, to injuries. When a human being is thrown from a vehicle and strikes upon the ground, the force with which he is carried is represented by the rapidity with which the body is moving and its bulk. Now, it took a certain amount of force to set his body in motion, and it would take an equivalent amount of force to arrest that motion. When he strikes against the ground this motion is arrested; he must meet with a force equivalent to that which is represented by his momentum. The force is thus annihilated and is expended upon the jarring. How can these vibratory impulses affect the individual? We must examine the hard and soft parts, and the attitude of the individual, and from our examination of inert physical substances, we have reason to go at once to the bones for the channel through which these vibratory impulses can

most readily be conveyed. The attitude of the patient at the time the blow is received is an important factor in determining the probable amount of injury. If the skeleton is erect and the patient is thrown forcibly upon his feet in the erect attitude, the resulting injury will be much greater than it would be if he were in a crouched position. But then, in this stooping attitude, the limits of the elasticity of his muscles, and the limits of the elasticity of the flexure, may be exceeded when the blow is so severe as to overcome the power of the muscles to maintain this protective attitude. Another important factor to be considered is: whether the patient be fat or lean, for we are dealing with a physical problem. Elastic substances are always the materials with which we annihilate or absorb vibratory impulses. Strike a living skeleton, such as you see in our museums, forcibly upon the breast, and you produce a shock that may result disastrously; whereas a blow upon a well-developed pectoral muscle is received with impunity.

Dr. GRÆME HAMMOND did not think that there was any question at all that cases of congestion of the spine and symptoms referable to the cord alone did appear after the spine had been in receipt of an injury. He thought the question of the greatest importance was: What is the nature of the trouble with the spine? whether it is a morbid change which goes on progressively, or whether it is simply functional.

Dr. W. O. MOORE stated that there were two classes of cases met with in ophthalmic practice. The first is that which we meet with merely upon the receipt of an injury to the spinal cord, viz., cases in which there was an increase in the circulation of the optic papillæ, and cases where there was decided neuro-retinitis. In one case there was atrophy of the optic nerve. Whether concussion took place, as claimed by the history of the patient, he could not decide, but two cases in his history-book give decided evidence that concussion of the spine did occur. In one case the patient fell from the second story, striking mostly upon his feet and buttocks. His general health was at once affected, and he was not able to attend to business thereafter. He had

more or less neurasthenic symptoms. Two years later failure of vision was noticed from ordinary atrophy of the optic nerve. Color-blindness then appeared, first for red, then for green, then for yellow and blue, and then it was entirely gone. After ten years' failure of vision he is now totally blind, and has no symptoms of locomotor ataxia or any thing of that sort. In the other case the patient was thrown from his seat on a wagon and fell in a heap, without striking any particular part of the head. Atrophy of the optic nerve took place on one side. The case was under observation about two years, until finally the atrophy was complete, and there was total blindness of that eye. In the other eye he did have for several days, two or three weeks after the injury, a flushing of the optic disk. At one time it was feared that it would likewise become atrophied. The last case was considered by some eye men rather a case of concussion of the optic nerve. That there is a connection between the symptoms of the spinal disease and the eye, there is no doubt. We see it causing atrophy of the pupil, and later on contraction of the pupil. He thinks there is no doubt a connection between the sympathetic and medullary fibres which go to the pupil. In these cases there was no direct blow to the eye nor head, and no laceration or contusion of any soft parts.

Dr. DANA considered Dr. Moore's cases extremely interesting, because they contradict entirely the very positive statements of Mr. Page in his work on "Injuries to the Spine." He then read the following letter from Dr. Allan McLane Hamilton regarding this subject:

"While I have been satisfied, from a very varied experience, in court and elsewhere, that the vast majority of those who claim compensation for railway injuries are malingerers and impostors, I still find that nervous shock is quite apt to develop a 'railway hysteria' in some, which is in every sense a real disease, and is due to actual physical disease, and in others to the development of a morbid expectant attention. It is unnecessary to adopt the extreme opinion of either Erichsen or Page. There is in sixty per cent. of the cases an intermediate condition in which subjective

symptoms are the only ones. In some of these cases the hemianæsthesia, lately described by Putnam, may be detected by abstract tests. In others we are furnished with vague yet unmistakable disorders of a functional yet serious nature. I strongly disapprove of the injustice of juries who manifest an asinine disregard of scientific proof, and award enormous damages because of prejudice against corporations, simply upon the story of the plaintiff. On the other hand, there are cases turned out of court when some award *should* be made. I do believe that in the great number of well-established cases of railway hysteria, that *moderate* verdicts should be rendered, just as they are in punitive libel cases when the peace of mind has been hurt. In the majority of cases no speculative damages should be allowed upon a simple personal relation of symptoms."

Dr. J. G. JOHNSON, of Brooklyn, asked Dr. Moore whether, in the case he mentioned, there was a connecting train of symptoms that showed that the blow did the injury.

Dr. MOORE replied that the man who fell from the wagon was seen thirty-six hours after the injury. He had failure of vision from the very beginning; in that case he had flushing of the optic nerve and decided symptoms of neuroretinitis. This gave way after a period of two years, and atrophy developed.

Dr. HARWOOD remarked that, out of a number of sufferers from railway accidents, he recalled two cases of spinal concussion. He advised the patients and the corporation to settle amicably. But his advice was not taken in either of the two cases, and they finally went to trial. His view was sustained by the jury, and a verdict was secured for the plaintiff; but what is very unusual in these cases, as he had observed them in suits that had been brought, these patients ultimately died from the results of their injuries.

Dr. ADAMS observed that most of the cases that showed any injury after a concussion generally showed it in the lower extremities. Many cases of Pott's disease were recognized by most authorities to be caused by concussion. It would appear that the milder injuries caused ordinary concussion of the spine, and more severe ones Pott's disease.

Dr. J. G. JOHNSON: I only wish to say that a fact, which would militate against any such hypothesis as that, is that, in the case of vertebral caries, which, according to this theory, is supposed to result from more severe injuries, we have none of the symptoms of spinal concussion. I merely want to ask the neurologists one question, and that is, if they have ever seen a case of spinal concussion in a railway employé (who takes the risk of the conveyance) without the physical symptoms showing either meningitis or myelitis? These anomalous symptoms, which are laid down by Erichsen with such fluency of language, I have never seen in my twenty-five years' experience as a railroad surgeon. I have never seen a single railway employé have them. And for this reason: Dollars and cents do not enter into the consideration of the railway employé. He has every inducement to get well; he has his family to support; if he does not get well in a reasonable time he goes out, and somebody else takes his place. On the other hand, the man who has been on a railway train, who has a good shaking up and a terrific scare, has no object in getting well. The company has got to pay him roundly; it has to pay him for his loss of time; it has to pay him for his suffering, both mental and physical; it has to pay his surgeon also; his surgeon has an unknown quantity to handle; he has something to treat that the patient does not understand. If the patient has a broken leg he knows what he has got, and the doctor cannot come in and discuss spinal concussion symptoms, and all that. He has seen broken legs before; has had cold extremities, vomiting, exhaustion, and so on; but he has not had the scare of a doctor coming in, feeling up and down his back to see whether it pains him, and asking him whether he can stand on his legs, and going through all those symptoms, that unknown quantity which they know so well to do. He has not had some confrère to come in and suggest some more doubts. The doctor, in a good many cases, is hungry, and the big corporation may pay his bill. He has to examine that back often; he has to find out just what these doubtful things mean; and the patient, having it iterated, and reiterated, and reiterated

again, begins to believe himself that there is something terrible the matter with him. He does not dare to go out and take a little fresh air and exercise (which, as my friend, Dr. Hammond, says, is the best thing to restore the nerves), because a railway man might be around and spy him using his limbs. He gets morose, and has no object to get well, because that suit is not settled.

I think there is no doubt that serious lesions of the spine and spinal cord do occur as the result of railway concussions. We have also mingled with it a large variety of other symptoms. When a train is suddenly stopped, the patient is violently thrown backward and forward, shaking up all the viscera, and the whole sympathetic nervous system and the other organs suffer. Added to that, this terrific fright and the utter helplessness of their condition, the effect upon the mind is something which is severe. But with all that, when you come to consider the fact of compensation, we find these cases so much aggravated that I do not think any physician is right to go into court and swear that the patient has disease of the spine unless he has the physical symptoms, and he should not simply rely upon the statement of the patient, who is interested to make matters as bad as he can.

I saw an extremely interesting case some years ago, which was the result of a railroad disaster on the New York Central Railroad. The patient, a lawyer in this city, was in a sleeping-car when it was derailed. He was thrown down an embankment, and I saw him the next day but one. He was in such a condition that he was put on a return train and came to Brooklyn. There were marked contusions of his shoulders, abdomen, breast, back, and hips, showing that he had received a violent rolling over. Some thirty-six hours from the time of his injury his limbs began to fail him. He could walk if he was watching where he placed his foot. If he walked, and you would speak to him, he would tumble over. That increased, and paralysis of sensation followed, until it extended up as far as the ninth dorsal vertebra. There was no shamming about it. I tried electricity; I burned his legs with matches, and things of

that kind, which he would not have been able to stand if it had been felt. Dr. Ranney saw the patient on behalf of the New York Central Railroad Company. The case was settled at about twenty thousand dollars. Dr. Ranney based his claim that he would recover on the fact of there being no wasting of the limbs. I at that time held the opinion that it was an extravasation of the blood around the substance of the cord; I did not think it could be in the pith, from the fact of its being limited to the nerves of sensation and not of motion. After that he recovered entirely and thoroughly, and his own physician and myself, who examined him subsequently, failed to find any indication of any physical pain whatever. He recovered in about six months.

There is a point of interest in regard to these spinal cases alluded to by Erb, that I would like to hear about from the neurologists. Men long connected with railway trains, as engineers, after a while lose their snap; they don't get in on time. Finally, they show a complete nervous break-down. Erb alluded to this particularly. What change has probably taken place in the old railway employés where there is this nervous break-down, which shows itself by a lack of courage and nerve-power, and by gradual failure? These cases are becoming extremely interesting in Germany, where the railway employés are allowed damages, just the same as passengers on trains, and this old, worn-out railway nervous system is being put in as a spinal concussion.

Dr. BIRDSALL thought that these cases were a good deal rarer than the general impression would lead one to conclude. The prominence which the work of Erichsen had been given, had led people to look for effects of spinal concussion, and to talk about them a good deal more than was really admissible from the facts of observation.

He had been led to conclude that many patients had, previous to their concussion, what was ordinarily termed neurotic or neuropathic constitution.

It had been stated by Dr. Weber that many of these symptoms were cerebral. He thought that they were de-

veloped probably as much from fright as from concussion of the spinal cord. On the other hand he would not be understood as denying the existence of functional, and perhaps something more than mere functional, disturbances of the cord from concussion. There was a good deal of difference between a single shock, a severe shock due to railroad accident, and the continual jarring which went on in a man in the cab of an engine. It seemed to him that in a healthy person, while the former might be readily recovered from, the latter, even of a more moderate character, would prove more injurious, and he should certainly be very careful about classing them in the same group.

Dr. JOHNSON said the length of time, doubt, and uncertainty of the cases are important elements to consider. As far as a surgeon for a railroad company being affected in his evidence by outside influences is concerned, he would find that truth was the first essential; he would not hold his appointment for twenty-four hours when his company was satisfied that he was not truthful. When we are sent to investigate a case on behalf of the corporation, we make as thorough and as exhaustive an examination as it is possible with the knowledge that we have, and our report is made in writing and goes to the company's office, with every thing bearing against us as well as bearing for us. If we misrepresented that case, and this is shown in evidence in court when the case comes to trial, it shows that we are ignorant or dishonest, and our walking tickets are prepared. No man can hold his position as a surgeon for a company who is not honest, because they pay by dollars and cents on an opinion, and if it is not truthful they do not want it.

LUTHER R. MARSH, Esq., said he was bewildered by the medical phraseology, which transcended that of the legal guild in the magnitude of its technology. If he were to ask the doctors the difference between "the whole of an undivided moiety, and the moiety of an undivided whole" they would understand his meaning, but they could hardly use a neurological sentence that would not send him to his dictionary. When quite a young man he had written an article for a local newspaper, without regard to sense, but

simply for the cadence of the sentences. The beginning of that article, which the good people of the town puzzled over with their glasses, ran as follows: "Pedaneous are the gorgeous geoponics of saginated hoplites." But while his big words were without meaning, theirs were not. He had gleaned from them that the spinal cord was certainly capable of injury, without any necessary harm to its bony or other coverings. The paper had seemed to him eminently impartial, steering a midway course between what the transportation companies might call the extravagances of Erichsen, and what suitors for personal injuries might class as the perversions of Page. He had also learned that when a man has been concussed, as the doctors called it, in the nerve-centres, he was never thereafter fully himself again. He did not, however, consider the word "concussed" felicitous. He was pleased to learn from Dr. Roberts that it was a good thing to be fat, and have a shield between one's self and harm. He considered this well shown in Dr. Hammond's case, where the woman was saved by landing on the voluminous natural cushion of her seating apparatus. The insinuation which had been made, that the consideration of the fee could swerve the testimony of the physician, he repudiated, and said that he stood up for the honor of that sacred calling which deals with the mysteries of human life, and which he had always held in reverential regard. From Dr. Dana's paper he had seen that he agreed with Chas. Sumner, that what a man most needed was backbone; that wonderful combination which enabled a man to stand erect, and firm, and unbending, in all emergencies.

Dr. DANA: I only wish to say with regard to one or two points that Dr. Johnson raised, first, with regard to employés not suffering from this concussion of the spine; I think he will find the symptoms of concussion of the spine, as delineated by Dr. Erichsen, were described by Dr. Abercrombie twenty-five years before Erichsen wrote, and his classification of spinal injuries would hold good now.

He was very glad that Dr. Johnson brought out the great importance of the malingering element, because it is an important one. Every one knows there is a prejudice in

juries against corporations. There are certain courts where a corporation cannot get a verdict any way, at least so the lawyers say. Therefore, I think that in justice we ought to keep that fact of malingering before us as being a very important one indeed.

As regards the trouble brought on in locomotive engineers, he thought that Dr. Johnson would find that Dr. Rigler, whom he quoted in his work on "Injuries of the Spinal Cord," has devoted a good deal of attention to this disease, which he calls sideromorphophobia, or fear of railways. He did not think that it was due to continuous concussion alone, because it occurred in locomotive engineers more often than in other employés. It seemed to the speaker that the constant strain and anxiety which these engineers suffered were very important elements in producing it.

In conclusion, he said that there was a class of cases that had not been much referred to in the discussion. Nervous and hysterical women, when frightened or injured on a railroad, were very liable to go to bed, and, under the sympathizing influence of friends and the prospect of large damages, develop a functional paraplegia with symptoms of spinal irritation. It was often hard to tell the exact amount of real injury for which the company was responsible. As a rule the companies were unjustly mulcted, though sometimes the trouble became a real one.

Stated Meeting, December 2, 1884.

W. J. MORTON, M.D., President, in the chair.

Dr. E. C. SEGUIN explained "A Method of Aniline Staining for Large Sections of the Brain," which had given him very satisfactory results. It consisted in a modification of Sankey and Bevan Lewis' method. In order to insure the best effects, it was necessary to allow the sections to absorb the dye slowly. The solution employed was an aqueous one of aniline blue black, having strength of one to two thousand. In this the sections were completely immersed and allowed to remain for from twelve to sixteen hours. They

were then washed, dehydrated, and mounted in balsam. He had not tested the value of this method for the study of minute histological details; but for examination with the naked eye he thought the method was superior to most others, especially in bringing out a sharp contrast between white and gray substances.

Dr. STARR had tried aniline black for smaller sections, but had not been pleased with the results. Recently he had used Weigert's hæmatoxylon method and found it eminently satisfactory. He thought the two methods might be advantageously combined.

Dr. WENDT remarked that such a combination would probably produce too great a mixture of colors, thus marring the distinctness of detail obtainable by either method when employed alone. Weigert's method was a good one, but required much care, skill, and time. As a general thing, the simpler a method, the more satisfactory would be its every-day use.

Dr. BIRDSALL was a believer in the chloride of gold for neuro-histological work. He was aware of its uncertainty; but the good specimens, which he had succeeded in preparing, were so beautiful as to compensate for the complete loss of other sections.

Dr. SACHS said that the difficulty of a method was hardly a valid argument against its employment. He instanced the staining process of Freud, of Vienna, which brought out the nerve-fibres quite black, upon a purple background. The paths of the fibres thus became particularly well marked.

Dr. J. LEONARD CORNING read a paper entitled "The Circulation in the Brain as Influenced by Electricity." He first referred to some previous studies, undertaken in order to determine the therapeutic applicability of the mechanical regulation of the cerebral circulation, the results of which were published in *The Medical Record* of February 18, 1882. The instrument which he at first devised had since been improved upon. The essential features of the new appliance consisted in a metallic fork, having a handle four inches long, and provided with two prongs resembling those of a large tuning-fork. To the

extremity of each of the prongs was attached a narrow sponge electrode. The prongs could be made to approximate or separate from each other at will by simply rotating the screw in the handle. It was thus possible, when the instrument was held at right angles to the neck, to adjust each pad with great accuracy over the corresponding carotid. When a galvanic current was conducted to these small electrodes by means of a bifurcated rheophore, secured to the negative pole of a galvanic battery, while the positive electrode was placed below the occiput, it transpired of necessity that all the structures interposed within the circuit were more or less affected. As a natural consequence the most pregnant expression of the activity of the electric current would be found in a greater or less modification of the functions of the involved nerves, namely, the sympathetic and pneumogastric.

The physiological results obtained in this way were due to: 1, arterial pressure; 2, contraction of the cerebral capillaries; 3, retardation of the heart's action. Besides these, we should doubtless have to include effects produced by threads of current upon the medulla, as well as collateral phenomena not easily amenable to analysis. Thus the phenomena which he had succeeded in evoking by the aid of this instrument were substantially as follows:

1, Dilatation of the pupil; 2, drowsiness; 3, dizziness (where strong currents and considerable pressure are employed); 4, drooping of the eyelid; 5, retardation of the heart's action (where exclusively strong currents are employed); 6, pallor about the lips and frontal region; 7, muscular weakness, as proven by the dynamometer—the subject, if standing, complains of weakness in the knees; 8, in anæmic individuals syncope may be produced, should excessive pressure and strong currents be employed; 9, the excitement incident to the primary stage of etherizations is cut short by resort to this method.

Having employed the instrument described in a variety of neuroses, particularly in migraine and epilepsy, with more or less success, the thought occurred to him that the efficacy of the procedure might perhaps be enhanced if some

means were devised by which compression and galvanization could be employed for more or less prolonged periods of time.

Accordingly, after many trials, he devised an appliance which appeared to fulfil all reasonable indications. It consisted in the first instance of an elastic belt, which encircled the neck, and to the centre of which was secured a framework of metal, resembling somewhat in shape that of a horseshoe. To the extremity of each branch of this apparatus was secured, by means of a ring and screw, a narrow, adjustable electrode, insulated by the interposition of a thin segment of hard rubber. The branches might be dilated or approximated at will by the aid of a screw which protruded anteriorly through the centre of the elastic belt.

In order to adjust the instrument the branches were placed on either side of the larynx in such a manner that each narrow electrode rested above the corresponding carotid. The branches were then carefully adjusted by the aid of the screw. The belt was then tightened and secured behind by means of appropriate buckles. The pressure was only carried to a sufficient extent to insure slight compression of the lumen of the artery, and not to such a degree as to cause the slightest inconvenience to the patient. By means of a bifurcated rheopore both electrodes were secured to the negative pole of a galvanic battery. A broad electrode, which was appropriately secured to the belt, was now placed upon the posterior aspect of the neck, and attached by a single rheophore to the positive pole of the battery. The current was then gradually increased, great care being taken in the execution of this portion of the operation. A water rheostat should be employed if possible, and the procedure should never be carried to such a degree as to produce tinnitus, dizziness, or extreme pallor about the ears and face.

In closing, Dr. Corning said: "I have employed the above apparatus in the treatment of a large number of neuroses. In epilepsy, congestive headache, mania, insomnia, and the convulsions of children it has surpassed my most ardent expectations. In the hyperæmic conditions of the

brain, incident to the prolonged abuse of alcoholic stimulants, and in other forms of vaso-motor insufficiency its prolonged employment has yielded excellent results. A noteworthy circumstance is the fact that the primary stage of excitement incident to etherization is effectually aborted by the use of electro-compression; and, indeed, the same may be said of simple pressure applied to the stems of both carotids, as abundantly shown by the observations of my friend, Dr. M. J. Roberts, of this city. Dr. Chichester, of New York, also tells me that he has succeeded in causing a permanent diminution in the rapidity of the heart's action in a patient suffering from exophthalmic goitre, by employing one of my instruments for electro-compression. Besides the above effects, which speak for themselves, I have recently had occasion to obtain additional proof of the pronounced influence exercised by this procedure upon the cerebral circulation. I applied the instrument to the neck of an infant whose fontanelle was still open, and observed that, when an interrupted galvanic current was employed, there was a perceptible sinking of the tissue above the opening.

"These phenomena are conclusive, even when interpreted in the light of the most guarded conservatism. Taken in conjunction with the results obtainable at the bedside, they may be urged in extenuation of the present researches in the cause of physiological therapeutics."

Dr. ROCKWELL said that he had no doubt that by electro-compression the brain and sympathetic system could to a certain extent be affected. But the main action of the apparatus was restricted to the surface. He did not believe that the cerebral circulation could be seriously disturbed by it. In all such investigations the varying degree of susceptibility should be taken into account. After applying electricity to the head some would experience profound drowsiness, others would feel scarcely any thing. He did not know whether the results were due to direct cerebral action, or depended upon the intermediate agency of the circulation. He thought that perhaps electro-compression might prove a valuable adjunct to other treatment, just as galvanism pure and simple did.

Dr. ROBERTS said that compression alone had acted well in some cases in his experience, notably in one case of infantile convulsions. An immediate subsidence of struggling had followed gentle digital compression of the carotids. Of course, further practical tests were necessary to substantiate the reader's claims.

Dr. SEGUIN saw no theoretical flaw in the method, and thought it deserved to be tried. Ophthalmoscopic examination might decide whether, and to what extent, cerebral circulation could be influenced by it.

Dr. BERG remarked that it seemed doubtful whether the sympathetic could be galvanized through the integument. He had failed to observe dilatation of the pupil, after using the current for fifteen minutes over the sympathetic.

Dr. CORNING replied that he had seen dilatation.

Dr. ROBERTS believed that the action of electricity might penetrate deeply, just as counter-irritation produced other than merely superficial effects.

Dr. WEBSTER stated that he had been unable to discover any change in the retinal circulation during compression, but perhaps this was owing to imperfections in the apparatus at the time of experimenting. He added, with regard to the relation between ocular and cerebral circulation, that hyperæmia or anæmia of the eye might occur independently of a similar condition in the brain. Strong carotid compression should certainly affect retinal circulation in a visible way.

Stated Meeting January 6, 1885.

W. J. MORTON, M.D., President, in the chair.

A paper on "Æsthesiometry" was read by GRACE PECKHAM, M.D.

Under this title the methods of investigating the cutaneous sensory apparatus were considered.

I. General or common sensation is tested by pricking, pinching, tickling, or, best of all, because more accurate and because one is able to determine by it the amount of time requisite for a sensation to reach the nerve-centres, the faradic current.

II. Tactile sensibility.—1. *Sense of pressure.*—Several instruments have been invented to record the power of the individual to determine mere pressure.

Weber's is the simplest. It consists of a rod, with a disk of wood, as a non-conducting subtance, to place flat upon the surface of the skin. The weights are arranged with a hole through the centre, so that they can be strung upon the rod.

Dohrn's instrument consists of a non-conducting disk arranged on a spring, so that upward pressure is recorded on a scale.

Eulenburg's paræsthesiometer is a spring balance with a dial to record varying pressure. He has found, in observations with this instrument, that a differential pressure of one thirtieth to one fortieth of an inch can be discriminated by the skin of the face, one twentieth to one tenth of an inch by the skin of the hand, arm, and anterior aspect of the thigh, leg, and dorsum of the foot.

Goltz' instrument, an india-rubber tube filled with water, whose waves in rising and falling record the smallest variation possible, is the most accurate.

It is interesting to find that the scale of pressure-results corresponds very accurately with those of Weber for sense of locality, with the exception of the tip of the tongue, which stands much lower.

It should be remembered that a colder weight is felt to be heavier than a warmer one, and that the sensitiveness is greater for an increase than for a decrease of the difference in weights, and also greater for a small absolute pressure than for a large absolute pressure.

2. *Sense of temperature.*—Numerous are the devices for determining temperature, varying from the simple methods of plunging the extremities into hot and cold water, blowing on the skin at a distance to test sensation of cold and breathing upon it to test that of warmth, the using, as did Weber, of test-tubes of oil heated to a known degree, to the complicated thermæsthesiometers of Eulenburg and Nothnagel, both of whom made the most delicate experiments possible. Nothnagel has shown that the small variation of 0.2° F. can

be distinguished in the most sensitive portions of the body, and 0.4° in the least sensitive.

3. *Sense of locality.*—This, of the various manifestations of sensibility, is the most commonly tested, and for this purpose Sieveking invented the æsthesiometer. Observations, as is well known, are based upon the physiological fact that two tactile impressions at certain distances, these distances, variable in different parts of the body, become fused into one. Sieveking's æsthesiometer was made with one point fixed, the other movable upon a bar upon which is a scale. Weber used a pair of compasses. Other æsthesiometers have been modifications of these two ideas.

During a year of testing with the æsthesiometer, while making a careful study of metallotherapy, I was often led to notice the difference made in the quickness of perception

by varying simultaneously the pressure of the two points. It occurred to me that an unconscious variation of pressure might easily mislead the investigator. An æsthesiometer which, without being clumsy, would record pressure, would be a desirable instrument. The æsthesiometer after the Sieveking pattern is, I think, more easily managed than that modelled upon the compasses. I therefore had one made like Dr. W. R. Birdsall's, which is on this principle. It is light, has a concealed needle, and can be attached to an electrode when the screw at the end is removed. Mine differs from his only in that the points are attached to spiral springs which allow of upward pressure. These springs are attached to a small rod, which is divided into degrees, each of which represents a pressure of 30 grms.

The instrument might also be used to test simple pressure

by adjusting to one of the points a disk of non-conducting substance, as wood. To test roughly the sense of temperature, two disks might be fixed to the two points, one of wood and one of metal.

A slight degree of pressure, almost unconscious, records thirty or sixty grammes, and yet it makes a great difference, often narrowing what the Germans call the sensation or tactile diameter one third or one half. The extent to which pressure increases the power of discrimination varies in different parts of the body. It is much less where the sensibility is most acute, as at the finger-tips.

By way of illustration simply of æsthesiometric variations with and without pressure, the following two cases are given.

In CASE 1, that of a young man, an ordinary æsthesiometer showed no difference between the two sides of his face, but he had a feeling of numbness in the left.

RIGHT SIDE.[1]		LEFT SIDE.	
Forehead, (24 mm.)	— P. 8 mm. 5 mm. + 2° P.	Forehead,	— P. 8 mm. 5 mm. + 2° P. Answer less prompt.
Cheek, (11.25)	— 5 P. mm. 4 to 5 mm. + ½° P.	Cheek,	— P. 7 mm. Same + ½° P.
Chin,	5 mm. + P. or — P.	Chin,	— P. 8 mm. 6 mm. + 1° P.
Neck, (33.75 mm.)	5 mm. + P. or — P.	Neck,	— P. 7 mm. 5 mm. + 1° P.

This case shows that the slight difference between the two sides without careful regard to pressure would be lost.

CASE 2.—Woman who complained of left leg, with constantly increasing inability to use it in walking. Diminished faradic excitability in both nerve and muscle.

RIGHT SIDE.		LEFT SIDE.	
Thigh, (77.5 mm.)	— P. 35 mm. 10 mm. + 2° P.	Thigh,	— P. 35 mm. to 45 mm. 15 mm. + 1° P.
Anterior of leg, (40.5)	— P. 40 mm. 29 + 1° P.	Anterior of leg,	— P. 40 mm. 20 mm + 1° P. (Marked hesitation.)

In order to make more accurate observations with the

[1] — P. denotes use of æsthesiometer without pressure, + P. use of pressure, 1° = 30 grms. The figures in parentheses show the distances given in Weber's tables as normal for the parts.

æsthesiometer, therefore, the following suggestions are made:

1. The same pressure should be used for corresponding parts which are compared or tested; if variations take place they should be recorded.

2. When comparing parts, the points of the æsthesiometer should be used in the same direction—that is, either longitudinally or transversely, remembering that in the latter case the tactile diameter is smaller than in the former, a distinction made by Wundt, who says that Weber's *Empfindung-kreise*, or circles of sensibility, should not be circles, but ovals. Nevertheless, Weber recognized this fact, and gives as exceptions the tips of fingers and tongue.

3. The response may vary, so Ross says, with the direction in which the points of the æsthesiometer are approached or separated; they are appreciated at less distance when commencing with the points wide apart and then having them approach one another.

4. Both points should be applied simultaneously, and with equal pressure.

5. One part should not be tested too long. The patient soon becomes weary of answering, and indifferent in his responses. Moreover, the attention really becomes fatigued. Again, if the tests are made too rapidly, the sensations, like those of the other special senses, become confused.

6. The nature of the response demands consideration, whether it is prompt or hesitating. If the latter, whether the slowness is due to a natural inability to respond quickly to external stimulus, or whether it depends on the presence of an abnormal state. It must be remembered, too, that the centres can be educated, so that improvement noted from time to time may be due to this.

7. The patient, of course, should not look, nor should the instrument be used according to the preconceived notion of the patients.

One of the most important considerations in connection with the subject is what should be considered the normal distance at which the two perceptions become distinguishable. The table most often quoted is that of Weber.

Vierordt has confirmed it, as have, after careful experimentation, Kottenkamp, Ullrich, Paulus, Riecker and Hartmann. Sieveking and Valentin have also given scales. The distances of Valentin are much less than those of Weber. As a general thing I have found them less than either. The cases already given to show differences of pressure will indicate this, and they are typical.

The matter is comparative rather than definite. Wide variations may occur because of environment. According to my experimentation, in comparison to the tables given by Weber, the Germans have less of the *Raum* or *Ort-sinn* than Americans or those who have resided in this country a long time.

Goltz and Czermak have stated that the touch diameter is much less for children than adults, such whose intelligence could be relied upon to answer. It is probably because the skin is more delicate. For this same reason there would be variations between men and women, between those whose skin was protected and those whose skin was not.

It is therefore a matter of comparison between corresponding parts of the same individual rather than between individual and individual, hence the importance, in order to obtain correct results, of making the tests of these corresponding parts exactly alike as far as possible, by placing the points in the same manner, and in regulating the pressure.

In the discussion which followed, Dr. DANA alluded to the general lack of precise knowledge concerning æsthesiometry, and thought that Dr. Peckham's instrument would aid in making matters clearer. The normal sensibility of the skin had been differently described by different authors. For practical purposes it seemed best to distinguish between common and special sensation. Temperature and pain belonged to the former. Special or tactile sensation revealed contact, pressure, and locality. So-called muscular sensation should be placed half-way between common and special sensation.

Dr. BIRDSALL said that in Dr. Peckham's instrument the additional contrivance for estimating pressure was very

valuable for purposes of careful physiological examination. It was necessary always to be very cautious about attaching diagnostic importance to the responses of patients. The practical use of ordinary æsthesiometry was limited to coarser tests. The additional estimation of pressure-sensibility might make the test more delicate and useful.

Æsthesiometry might show that in a given case there was general slowness of appreciation, rather than actual tactile disturbance.

The President thought that the instrument of Dr. Peckham might be further improved by attaching a scale in such a way that an accurate record would be had of the amount of pressure used. Unless this addition be made, different observers would necessarily record different results. With an agreement as to a normal standard of pressure this source of error would be obviated. In this way we might soon have a serious of systematic observations, that would be a great help, especially in practical office examinations.

Dr. PECKHAM remarked that her æsthesiometer was intended for the determination of cutaneous sensibility merely. The muscular sense would have to be tested in other ways. In order to have exact records of the amount of pressure employed, water would have to be used as a recording medium. This, however, would make a clumsy instrument, and one not readily carried in the pocket. Besides, æsthesiometry was intended, not for absolute, but only comparative results. If, in place of a water-gauge, metallic springs were employed, they would yield after a certain time, unless very conscientiously tempered, which would make such an instrument too costly.

Dr. B. SACHS then made some remarks on "The Use of the Absolute Galvanometer," and demonstrated Hirschmann's new instrument. (See p. 19.)

Dr. JACOBY had seen Hirschmann's instrument in active use, and was convinced that it was the most perfect apparatus of the kind yet devised. He believed it to be quite independent of terrestrial magnetism.

Dr. BIRDSALL remarked that one objection to all vertical galvanometers consisted in the fact that their magnetic

intensity might change. The skilled labor involved in constructing good apparatus of this kind had led American instrument-makers to avoid manufacturing them. He believed that the importance of the galvanometer was more apparent for purposes of accurate diagnosis than for therapeutical efforts. General practitioners had certainly been able to obtain beneficial results without resorting to the use of accurate current measurements.

Dr. BERG said that the scale on the vertical galvanometer should not be made up, as in Hirschmann's instrument, of equal distances, as the factor of gravity was thus left unprovided for.

Dr. SACHS pointed out that the instrument was particularly useful for general practitioners, who only made occasional use of their batteries. The number of cells employed could not be a measure of the strength of the current. And in this way injury in place of benefit might result, especially whenever the head was concerned. With both poles on the head currents of more than $1\frac{1}{2}$–$2\frac{1}{2}$ M. A. should never be used.

PHILADELPHIA NEUROLOGICAL SOCIETY.

Stated Meeting, January 26, 1885.

The President, S. WEIR MITCHELL, M.D., in the chair.

Dr. H. C. WOOD presented to the Society the feet of an ataxic patient illustrating Charcot's joints.

The specimens were from the Mütter Museum of the College of Physicians, the feet of an ataxic patient that had been under his care at the University Hospital. He expressed the opinion that there was a close relation between this disease of the bones in ataxic cases and syphilis.

A paper was read by A. SYDNEY ROBERTS, M.D., by invitation, on "The Spinal Arthropathies," a clinical report of six cases of Charcot's joints.

CASE I.—M. K., male, æt. forty-one, referred to the New York Orthopædic Dispensary from St. Luke's Hospital on May 5, 1879. Hereditary history unusually good. He is a moderate drinker. Health excellent until manifestation of present joint trouble. Married and the father of five healthy children.

Condition on date of entry: A large nodular tumor was found over the left hip-joint, oval in shape, the long axis of which corresponds with line of Poupart's ligament. Transverse diameter of normal limb over hip-joint, 22 inches; of affected limb at same point, 30¼ inches. No muscular atrophy detected by measurements of circumference. Left limb 1⅜ inches shorter than its fellow; measurements made from the umbilicus. External iliac fossa of left side filled with osteophytes, which add to bulk of tumor. The ligamentous structures about the joint seem entirely destroyed; motion of limb abnormally free in all directions. Head of femur probably absorbed or greatly atrophied. Limb abducted and rotated outward. What appears as the head of the femur is anterior to its normal position, lying under a "shed" of bone, built out from the pelvis, which covers its atrophied extremity like an umbrella. When the patient flexes the limb, the

upper extremity of the femur glides forward until it catches under this shed of provisional bone, which, acting as a fulcrum, allows the patient to flex and rotate the limb with ease.

A thorough examination of the patient for evidence of a central lesion, revealed the absence of numbness of limbs, of pain, or of constricting bands ; sensation slightly impaired on left side. On right side, reflex action increased on titillation of soles ; none on left. No tendon reflex in either limb. Sways with " closed-eyes test."

Condition eighteen months later : The patient presented all the marked symptoms of locomotor ataxia. Two years from date, upon which the above notes were recorded (May 5, 1879), he is confined to bed, with complete loss of muscular coördination.

Remarks.—The case exhibits an arthropathy existing four and a half years prior to the development of active tabetic symptoms, and shows a tendency, from early stages, to the formation of osteophytes about the joint, with early atrophy of the upper epiphysis of the femur.

At no time during the progress of the lesion were there developed reflex neural symptoms that would point to joint inflammation.

The joint lesion (swelling and tumefaction) diminished as the active symptoms of ataxia advanced. Provisional callus was thrown out about the atrophied extremity of the femur as a substitute for the destroyed acetabulum.

CASE 2.—Male, æt. forty-four. Registered as an out-patient in the New York Orthopædic Dispensary on January 29, 1879. The following notes were recorded :

Hereditary History.—Parents living and healthy ; one brother died of phthisis. Patient is married ; has three children, two in excellent health ; the third has an intrapelvic abscess. (Subsequently died of amyloid degeneration of the kidneys. Patient has had to work very hard, with considerable mental anxiety ; no other known cause for present disease.

The left knee and ankle are enlarged, the latter more so relatively than the knee. The patient states that seven years ago, while working, a heavy box fell upon him, injuring the ankle. The joint became swollen, and he was " laid up for two months." He recovered, and suffered no inconvenience for one year ; the swelling again returned in the same ankle and involved the entire leg. At this time he was incapacitated from work for three months ; he recovered, and has had no active joint symptoms since. Has never had an abscess about the joint.

The urgent symptoms at present examination are those of locomotor ataxia. He cannot walk without staggering, and when at-

tempting to do so in the dark, or with closed eyes, falls. Suffers from ataxic pains in the right leg and arm. Is uncertain in guiding his finger to the tip of his nose, with eyes closed, or in putting his heel on a designated spot. Sensation impaired in right hand and arm; has difficulty in buttoning his coat with that hand. When standing or walking in his bare feet, he feels as though he were on cushions; vision unimpaired (eye-ground not examined).

On February 4, 1879, Dr. Cloves Adams saw the patient in consultation, and thought him to be suffering from locomotor ataxia in the third stage, with osseous changes in left ankle and synovitis of both knees.

The patient returned to the Dispensary in September of the same year, with a marked elastic swelling of the right elbow-joint.

A year later (November, 1880) he was referred to the clinic of Dr. E. C. Seguin. He again applied to the Orthopædic Dispensary on February 14, 1881. The ataxic symptoms had advanced; he walked with extreme difficulty. The condition of the joints remained about the same as when last examined, now four months ago.

During November (1881) the patient was critically examined by Dr. S. Weir Mitchell, and pronounced to be in the third stage of locomotor ataxia, with spinal arthropathies of the right elbow- and left ankle-joints. It was noted that the circumference of the elbow tumor had materially diminished since the last measurements were recorded (decrease of two and a half inches).

Remarks.—The joint enlargements in this patient presented three characteristic peripheral ataxic conditions.

1st. At the knee-joint synovial irritation, indicated by the physical signs of a chronic synovitis; although at no time during its course was there evidence of inflammation.

2d. A characteristic doughy, nodular ataxic joint tumor of the elbow, largely composed of osteophytes and excessive synovial secretion.

3d. Hypertrophy of the lower epiphyses of the tibia and fibula, with but slight synovial irritation.

The peripheral manifestations at the knee and ankle accompanied the earlier symptoms of ataxia; the elbow tumor entered abruptly upon the second stage of the sclerosis. I am indebted to my friend Dr. Newton M. Shaffer, of New York, for the privilege of reporting the above notes.

CASE 3.—J. H., male, æt. forty-five; was admitted to my wards in the Philadelphia Hospital on April 3, 1883. The following notes were recorded: A vigorous, well-nourished man, with

little personal knowledge of his family or their history. Knew his parents lived to advanced age, but thought both of his brothers had died, and likewise two sisters. Acknowledged to being strongly addicted to the use of alcohol. He thought his present trouble arose from a "dissipated life and constitutional syphilis."

Two years ago, after a debauch, his attention was directed to painful swelling of his right great toe. This lasted a few days, and as the pain and swelling of the toe subsided, the right ankle-joint enlarged. This swelling slowly and painlessly increased, and three months from its onset the same condition appeared in the left ankle-joint. Without especial discomfort to the patient this joint enlarged. He continued drinking to excess, and was admitted to the hospital in a state of chronic alcoholism.

An examination two weeks after admission, when all traces of alcoholism had subsided, gave evidence by the following facts of a central lesion: He had suffered from constricting pains about the abdomen, and occasional darting pain in the region of the hips and thighs for the past year. He also experiences considerable difficulty in walking, especially at night. At present he has a staggering gait. Absence of patellar reflex in both limbs; sways and falls with "closed-eyes test," and has difficulty in finding tip of nose with forefinger when eyes are closed.

The metatarso-phalangeal articulation of the right great toe is ankylosed. Both ankle-joints are enlarged, apparently by a diffuse hypertrophy of the epiphyses of tibia and fibula. This increase has almost doubled their normal circumference. The subcutaneous tissues are slightly œdematous. The capsules of ankle-joints are distended and elastic.

When first admitted, the tissues about the ankles and legs were swollen, presenting the appearance of diffuse cellulitis. This subsided in a few days from rest and local treatment.

My colleague, Dr. C. K. Mills, saw the patient with me in consultation, and confirmed the diagnosis I had made—of posterior spinal sclerosis, with accompanying arthropathies at ankle-joints.

Remarks.—The joint hypertrophy had preceded any active symptoms of ataxia. The character of the joint enlargement was that of bony hypertrophy, without a tendency to the formation of osteophytes or to a nodular irregularity of contour. The possibility of rheumatism or of malignant disease was considered and dismissed. A thorough physical examination failed to detect any of the characteristic reflex neural symptoms of an epiphyseal osteitis.

The history of the progress and course of the ankle-joint hypertrophy, together with the evidence of a central lesion and the negative physical signs of local joint inflammation, all confirmed the diagnosis of an arthropathy of spinal origin.

CASE 4.—Dr. A. A. Y., male, aged sixty-five, resident of Hammonton, N. J. Examined the patient with Dr. S. Weir Mitchell on January 16, 1885. For the substance of the following notes I am indebted to Dr. Woodnutt.

History of patient: Family history excellent. He had always been strong and healthy during youth and up to 1865, though a hard-working farmer. An army life, and three years of extreme exposure prior to the close of the war, found him suffering in 1865 from sharp, wandering pains in the upper and lower extremities; never noticed, however, in the articulations. Loss of power followed in the right leg. Three years later suppurative arthritis attacked the metatarso-phalangeal articulation of the right great toe, and last phalanx of left ring finger, sequestra coming away in each instance.

During 1870 the patient first noticed an œdematous swelling of the right elbow; following shortly upon this, the wrist-joint of the same arm gradually and painlessly enlarged. Then a distention of the capsule of the right knee-joint succeeded. The enlargement of the latter articulation was more rapid than either the wrist or elbow. Rheumatic pains in the joints accompanied the swelling and deformity.

The left limb has been comparatively exempt from pain. Recently, however, the capsule of the knee-joint has become distended and elastic. The elbow tumor has diminished somewhat in circumference during the past four years.

During the past year the distal phalanx of the right index finger has gradually atrophied, without inflammation, and is entirely wanting. The nail and finger end are normal, though somewhat shortened. Pain at present is chiefly in both feet, paroxysmal and erratic, often attacking corresponding points on the legs.

The present appearance of the right elbow- and left knee-joint enlargements exhibit an irregular nodulated hypertrophy, bearing no resemblance to normal joint outline, and consisting chiefly of osteophytes and abnormal increase of synovial fluid. Motion preternaturally free in all directions; structure of joints apparently entirely destroyed.

Remarks.—The joint lesions first appeared in this patient after ataxia had become established. The appearance of the affected elbow and knee is that of an enormous nodular hypertrophied mass of bone, doubling their normal circumference, associated with synovial distention of the capsule. Osteophytes readily movable within the capsule, and varying in size from a pigeon's egg to that of a turkey.

The atrophy of the distal phalanx of the right index finger is especially to be noted, it being the first instance of complete absorption of the diaphysis of bone that I have had an opportunity of observing.

CASE 5.—W. H. McC., male, æt thirty-eight, married. Admitted to the Orthopædic Dispensary of the University Hospital in July, 1883.

Hereditary history excellent; no evidence could be obtained of articular disease, rheumatism, or phthisis in any member of his family. He presented at date of examination the appearance of a healthy, well-nourished man. Has always worked industriously at his trade of plumber. A moderate drinker. He had constitutional evidence of syphilis, following a chancre contracted in 1863.

The patient attributes the present enlargement of the right ankle-joint to an injury received while working in a cramped position. Following this strain, the ankle became suddenly discolored and swollen, bursting the buttons from his shoes. He was incapacitated for work during the succeeding four days; at the end of a week the discoloration and swelling had about disappeared. His attention was then first directed to a bony enlargement of the right ankle-joint. This slowly and painlessly increased in size without any appreciable interference in locomotion. At present examination the enlargement resembles a simple hypertrophy of the lower epiphyses of the tibia and fibula. The outline of the joint is globular, with slight elasticity of capsule. No pain or reflex muscular spasm.

Record of Spinal Symptoms.—Complains of darting pains about hips. Has difficulty in walking at night. Sways with closed eyes. Complete absence of patellar reflex on both sides. Dr. Horatio C. Wood saw him with me in October of 1883, and pronounced him ataxic.

Remarks.—This case presents an arthropathy that apparently followed a direct traumatism to the affected limb. From careful interrogation, I determined that the acute swelling and ecchymosis resulted from rupture of a varicose vein, inasmuch as these were numerous, and greatly engorged about the affected ankle. This first attracted his attention to the ankle, the deeper bony growth being detected when the active symptoms of subcutaneous swelling had subsided.

The hypertrophy of the joint has increased the circumference four and a half inches over its fellow.

CASE 6.—A specimen of shoulder-joint arthropathy, lately removed at an autopsy held upon the body of a well-marked ataxic, has been referred to me by Dr. S. Weir Mitchell, to embody in this report. The joint had become suddenly and painlessly enlarged in the later stages of the central lesion. It presented *ante mortem* all the characteristic symptoms of a tabetic arthropathy; distention of the capsule, abnormal mobility, and the

presence of osteophytes. The joint, upon examination, presented the following:

1st. Cartilag ecovering head of humerus eroded; that upon glenoid cavity irregularly thickened.

2d. Anterior margin of glenoid cavity worn away, allowing the head of bone to rest in position of forward dislocation.

3d. Osteophytes abundant about junction of capsule with anatomical neck. Marked relaxation of ligamentous structures, and distention of capsule.

4th. General hypertrophy of epiphysis, somewhat nodular at margins. Evidences of hydrarthrosis.

The practical deductions to be drawn from a clinical study of the above somewhat anomalous cases may be briefly summarized as follows:

Period of Development.—1st. The tabetic arthropathies may occur independently, or precede the active symptoms of locomotor ataxia.

2. They occasionally develop suddenly, late in the course of a posterior spinal sclerosis.

Nature of Lesions.—The peripheral expression of central nerve irritation is characterized by the following changes found in the structure of the various articulations:

1st. A chronic asthenic hyperæmia of the synovial membranes; a hydrarthrosis.

2d. An interstitial atrophy of the epiphyses.

3d. A fungous or rarefying epiphyseal hypertrophy.

4th. The formation of osteophytes and bony stalactites.

These various joint expressions characteristic of the spinal arthropathies may exist separately; but are usually combined in the same subject.

Differential Diagnosis.—They may be readily distinguished from the common inflammatory lesions of the epiphyses by the total absence of the reflex neural phenomena—*i. e.*, of pain, both reflex and local, the apprehensive state regarding joint movements, and the reflex or tetanic spasm of the muscles, always associated with joint arthritis. Abscess is never directly associated with the arthropathies, unless incident upon direct traumatism.

They are more difficult to differentiate from malignant disease of the articulations; but a careful inquiry into the history and course of the lesion, and the presence or absence of central disturbance, are our most reliable guides.

Course.—The progress of the arthropathies is essentially chronic. Occurring early, not infrequently, in the history of the tabetic lesion, they slowly increase, with occasional exacerbations, and years elapse before fully matured. A rapidly developing arthropathy may be associated with the later stages of an ataxia. Their course is self-limiting, though never reparative.

Dr. MORRIS J. LEWIS reported a case of locomotor ataxia with loss of teeth and alveolar processes. The following anomalous case of locomotor ataxia has been under my care for three months in the Episcopal Hospital. He is now under the care of Dr. Henry M. Fisher, who courteously allows me to use the notes of the case.

Mr. A., æt. forty-five, a well-marked ataxia for over five years, presents the following history, some points of which seem well worthy of record. Nasal catarrh exists in several members of the family, including himself. During the war he was wounded in the hip and ankle, slightly; the wounds healed kindly. He was confined for some time in Libby and Belle Isle prisons, and since then has never felt strong. He denies having had syphilis. When thirty-nine years of age he began to show the first symptoms of ataxia; these were diplopia, dizziness, and a staggering gait. One and a half years later he began to have lancinating pains in the extremities, and later in the bowels. Five years ago he began to have transient attacks of difficulty of hearing, and this has increased since then until about one year ago, when he became absolutely deaf.

He has always been constipated, and one year ago had slight difficulty in urination. Within the last seven months he has had severe gastric crises. Eyesight good until the last seven or eight months, except during the first year. Four years ago the symptom for which I present the case to-night first appeared. This was a loosening and a subsequent falling out of the lower wisdom teeth. No pain nor discomfort preceded this, and the teeth were perfectly sound. In fact he had an uncommonly fine set of teeth. After this his teeth gave him no trouble until about seven months ago, when the same change began in the upper jaw, causing the loss of every tooth except the right first molar, which still remains firm.

The sequence of these events appears to be as follows: First, the teeth loosen, then the gums recede, showing in places the alveolar processes denuded, the teeth then fall or are pulled out by the fingers, and finally the alveolar processes separate in small fragments, with slight suppuration,

or are detached in larger pieces. The gum then heals. The largest piece of bone thus separated shows the sockets of three incisor teeth, and a portion of a fourth. The teeth show no absorption of their fangs, and are almost without exception perfectly sound. About four months elapse between the loosening of a tooth and the final healing of the gum.

Other points of interest in this case are as follows: the patient is extremely pallid; he has the ataxic gait, although this is not very pronounced. He cannot stand with eyes closed. The knee-jerk is absent, and has been for at least four years. There is no anæsthesia of the feet or legs, and the patient localizes touch fairly; there is, however, some analgesia. There is no retardation of sensation. Examination of the eyes shows external strabismus of both eyes. Pupils pin-point for near accommodation, and relax for distant vision; no reaction to light. Ophthalmoscopic examination shows left eye-ground normal, and but slight atrophy of nasal border of right disk. His sense of smell and of taste is good. There are no lesions in any of his joints to be detected.

Dr. LAMBERT OTT presented a case of locomotor ataxia with Charcot's joints.

S. H., aged forty-five years, a travelling salesman. In 1866 he contracted chancre, no secondary symptoms following. In May, 1881, his present disease began with shooting pains in limbs and unsteadiness of gait. In November, 1883, I first saw him and diagnosticated his condition as locomotor ataxy. At the present time there is very little missing that goes to make up the symptom-group of this disease. In December, 1883, about two and a half years after the beginning of his trouble, he noticed a swelling of his left ankle. In the morning it seemed less, and in the evening it had increased to such an extent as to cause difficulty in taking off his boot. He had no pain, no impediment in using the joint, and had it not been for the swelling he would not have taken any notice of it. He thinks the swelling reached its maximum in two weeks, and there has been no great variation since, except that in the evening it is slightly increased. At present his foot is moved normally, but when the back of the leg is grasped and extreme flexion made, crepitation is imparted to the hand; the swelling is confined to the inner and dorsal surfaces of the ankle-joint, and feels bony. The joint measures in circumference one and a half inches, the leg at midcalf one half inch more than the

opposite limb. There is no pain or tenderness on pressure or rough usage. He has been under treatment fourteen months, and has taken corrosive sublimate and chloride of gold and sodium. The electrical treatment at first was central galvanization and general faradization, and latterly the metallic brush, with the rapidly interrupted faradic current, with marked improvement.

The next paper was entitled "Note as to the Comparative Effects of Active Voluntary Exercise, and of Passive Exercise by Massage, on the Production of Albuminuria," by W. B. KEEN, M.D.

At the request of Dr. Mitchell I desire to call your attention, briefly, to one point of value in the use of massage, heretofore, so far as I know, unrecognised.

A patient, Mr. C., called upon me for relief from quite severe, constant, and long-continued pains in the calves of his legs. During the preceding year he had walked, as a matter of exercise, neary two thousand miles, and during the year before that had travelled around the world, making long rides and walks a marked feature of his trip.

In examining his case thoroughly I found that he had an albuminuria, the sediment forming (by heat and nitric acid) a varying bulk, on standing, of say from 3 to 10 or 15 per cent. This albuminuria I found, on further and most careful examination, to be curiously dependent upon exercise. This I finally tested in the following way: I put him in bed for three days, and examined three and sometimes four specimens of urine passed at different times in the twenty-four hours. No albumen appeared at any time during these three days of rest. The last examination I made at his house at 1 P.M., on the third day. He emptied his bladder at that hour, and the urine was free from albumen. He then dressed and walked, by a pedometer, a measured mile. Immediately on returning he passed water which had about 5 % of albumen. One hour later it had still a trace; two hours after the walk it was free. The next morning's urine was still free, but that passed at 9:30 A.M., at my office, after walking from his home, a mile distant, had again about 5 % of albumen.

A few days later I employed massage. This was thoroughly done for from forty to fifty minutes, by a most competent rubber. Examining the urine immediately before and immediately after the massage, both specimens were absolutely free from albumen. This I tested several times with identical results.

This is a striking addition to Dr. Weir Mitchell's observations as to the resulting tissue-changes induced by massage, and especially shows its value as a means of passive exercise without deleterious effects through nervous exhaustion. I

believe the value of the massage to lie in the resulting stimulation to the muscular tissue, and the promotion of its nutrition without such changes of blood pressure and vaso-motor tonus in the muscular coat of the vessels as induced the curious albuminuria after voluntary exercise above noted. The very probable nervous origin of albuminuria, as shown by its frequency in cases of long-continued nervous strain, and by the researches of DaCosta and Longstreth, would seem, also, to have a new confirmation by this observation. I regret that I did not at the same time observe the blood pressure by the sphygmograph, as it might have thrown additional light on the unusual facts above detailed.

My attention has also been called by Dr. Mitchell to an article on "Albuminuria as a Symptom," by the late Dr. Calvin Ellis, in the *Boston Medical and Surgical Journal*, 1880, vol. xxv., p. 388.

The following somewhat analogous cases are referred to by him: In one case (Dukes: "The Albuminuria of Adolescents," *British Medical Journal*, Nov. 30, 1878, p. 794), a young man's urine was normal while in bed. On rising and taking milk only it would continue so, but after eating a piece of bread the albumen would appear. As he improved while lying in bed, meat could be eaten without any change in the urine.

While this would look to digestive changes as a cause, the so-called post-cibal albuminuria, the following cases are more positive evidences of the effects of exertion in the production of albuminuria:

Edlefsen (*Berl. klin. Wochen.*, Sept. 22, 1879) noticed in three healthy but anæmic men transient albuminuria after exertion. Leube (*Virchow's Archiv*, v., 72, p. 145) examined the urine of a large number of healthy soldiers in the morning, and found it normal, but after a five-hours' march or severe exercise, in June, July, and August, with a temperature of 54° to 77° F., it contained albuminuria in 16 %, though the amount was small and never exceeded 1 %, and there were neither casts nor blood corpuscles. This could not be detected at a later examination, between 4 and 6 P.M. The same was seen under similar circumstances in

army officers in connection with scanty urine, and also in nervous persons. (Fürbinger, *Zeitsch f. klin. Med.*, 1, p. 345.)

"It is most natural to suppose that its presence was owing, either to some variation in the blood pressure, or to some change in the vessels. The rapidity of its appearance and disappearance makes it extremely improbable that there was any change in the vessels, and we are left with a variation of the blood pressure. The view that the last might be operative seems to be supported by the statement of Ranke, that the blood accumulates in the muscles of a healthy man during exertion, while it is diminished in the organs which are at rest."

I may mention that in the case of Mr. C., in the course of a year the albumen has become constant, though his exercise has been restricted to the least degree consistent with health; but the amount is never over a faint trace. At no time have any casts or blood been discovered. A prolonged sea voyage is now being tried as a means of cure.

A paper was read by invitation on "Hysterical Affections of the Eye," by GEO. C. HARLAN, M.D.

As it is well known, patients in the psychological condition called hysterical, may not only present almost any symptom of disease, without the existence of any lesion to which such symptom could be referred, but sometimes make excursions beyond the limits of classical pathology, and puzzle their doctors by originating symptoms that no possible lesion could explain.

It has seemed to me that the eye is an exceptionally pregnant seat of such affections, and that their occurrence there has hardly received the attention from neurologists, or perhaps even from ophthalmic surgeons, that might with advantage be given to it. The accuracy with which eye symptoms may be analyzed, and the comparative certainty with which material changes in the tissues of this organ may be excluded, afford special facilities for the study of its functional, neurotic disturbances, which may often furnish the key to mysteries in other regions.

It is not my intention to trespass upon your time and

patience by an extended discussion of this rather wide subject, but merely to direct attention to it by describing some of the symptoms of this class that have been met with in my own experience. As the shortest way of accomplishing this end, I will consider them in the anatomical order of the parts affected.

The lids are subject to both spasm and paresis of an entirely hysterical character. The former was well illustrated by a case recently published in the *Medical News*, in which violent and persistent blepharospasm, which had resisted other treatment for months, was cured at last by mental impression. The latter occurs in a singular form of transient paresis of the levator, occurring only on rousing from sleep.

The subjects of this affliction complain of a great difficulty, sometimes an entire impossibility, of opening the eye on awakening. In some cases this occurs always in the morning, in some even after a nap during the day, and in others only when aroused during the night, when perhaps the consciousness and will-power are regained less promptly. Such patients say that the lids seem too heavy to be moved by their own muscles, but after they have raised them with the finger, or bathed them in cold water, the difficulty does not recur until they sleep again. My attention was first called to this symptom some ten years ago, and I have met with so many cases since that I have come to consider it not very uncommon. Both eyes are usually equally affected, but in several instances only one was involved. In one of the latter now under my care, the affected lid has a slight degree of granular conjunctivitis, which could scarcely have other than a mental influence as a cause. With one exception the subjects were all delicate women, some of them nursing. Of course this is not a symptom to be lightly considered, without a careful investigation of the patient's general condition. The first time that I noticed it, it was one of the earliest indications of intracranial tumor, which, a few months later, caused the patient's death.

Irregular action of the external muscles of the ball is so frequently met with in nervous subjects, that a well-known

ophthalmic surgeon has discovered it to be the cause of nearly all the ills that nerves are heir to, and claims to remedy these ills by operating on the muscles. In fact, the external ocular muscles of hysterical patients are, in a large proportion of cases, not much better balanced than their minds, and, no doubt, decided results may sometimes be obtained by operating at the same time on both.

The most common form of this disturbance is insufficiency of the internal recti, which frequently occurs independently of any error of refraction. When very decided in degree, it may easily be detected by directing the patient to look at some small object eight or ten inches from the eyes, and then holding the hand before one eye. The covered eye, thus relieved from the effect of binocular vision, will deviate outward. In some cases the preponderance of action is with the internal recti, and in others no two examinations made in different days will give the same result.

A spasmodic contraction of one muscle is more rare. I reported the following well-marked case some years ago (*Transactions of the Phila. Col. of Physicians*, '76):

> Miss M., a little below par in general health, and of extremely nervous temperament, complained that frequently, and without special exciting cause, as at the dinner-table, or at the opera, every thing suddenly appeared double, and at the same time it was evident to her that she had lost control of the movements of one eye, which felt as if forcibly turned to one side. On closing the lids and pressing the ball for an instant, the symptoms would disappear. The acuteness of vision was normal, the balance of the external muscles correct, and refraction nearly emmetropic. The correction of an hypermetropia of .75 D. did not prevent the recurrence of the annoyance. Two other patients have complained of occasional transitory diplopia; in one case horizontal, and in the other vertical. These patients occasioned much anxiety at the time—one ten years, and the other about six months ago,—but I have seen both recently, and they are in good health. In this connection may be mentioned two curious cases of monocular diplopia. In each the symptom persisted for several weeks, but was without physical cause, and disappeared without special treatment.

The case recently reported (*Med. News*) of hysterical mydriasis and paralysis of accommodation, occurring in one eye only, persisting for months, and finally relieved by

mental impression, is, I believe, unique. There can be no suspicion of deception here, as there is no known mydriatic whose effects can be made to disappear so promptly and completely as these symptoms did.

Paresis or spasm of the accommodation is not infrequent in neurotic subjects. The latter occurs usually, though by no means always, in connection with some error of refraction, which acts as the exciting cause.

Retinal anæsthesia is a symptom which often occasions great annoyance to ophthalmic surgeons in testing refraction. Its subjects may at one moment have full acuity of vision, while at the next, with the same glass, it is very much diminished. They say that the letters become blurred and fade away after they have looked at them for a few seconds. The fact that this symptom persists under atropia shows that it is due, not to irregular action of the accommodation, but to exhaustion of the sensibility of the retina.

This condition of the retina makes the typical hysterical field of vision more restricted on the side that is recorded last in the testing. Such fields, the tracing and discussion of which have afforded much entertainment to the curious, are rarely found the same at any two examinations. A patient recently presented herself at the Polyclinic with complete horizontal hemianopsia of the right eye only. There was complete blindness below the horizontal line. As the ophthalmoscopic appearances were normal, I suspected hysteria. At her next visit the hemianopsia had disappeared from the right eye and appeared in the left, still in the lower half of the field, but with an irregular border. It was several times transferred from one eye to the other, each time with a more irregular outline, and after a few weeks disappeared entirely, leaving the field in both eyes quite normal.

I have met with several cases of colored vision—blue streaks, yellowish fogs, etc., of transitory character and evidently nervous origin.

Unsteadiness, or even apparent constant motion, of any object looked at, particularly print, occasionally occurs and, not admitting of any physiological or optical explanation, may be classified as hysterical.

The most striking symptom, and the one that has naturally excited the most interest, is simulated blindness. For obvious reasons of expediency, this is usually monocular. At various times in the last ten or twelve years, I have reported four well-marked cases (*American Journal of Medical Sciences*, October, 1873; *Transactions of American Ophthalmological Society*, 1882 and 1884). Two were cured by exposure, and the others got well without ever knowing that they were suspected—possibly without having suspected themselves. One of them had a history of an attack of complete blindness, evidently of the same character, of both eyes occurring some time previously; and another such case has been reported by Dr. D. H. Agnew (*American Journal of Medical Sciences*, October, 1873).

Various tests have been devised for the detection of simulated monocular blindness. The one most used has been Graefe's prism test. If the patient can be made to admit double vision when a prism is held before the well eye, vision with both eyes is proved. A very simple test suggested by Warlamont may sometimes succeed, and, in his hands, has proved conclusive even as legal evidence. He displaces the axis of one eye by slight pressure upon the ball with the finger, and shows the suspected person two small dots on a piece of paper. If he says there are four, he is at once convicted. It must be remembered that these tests do not show how much the eye can see, and do not even prove useful vision. This can sometimes be done by an equally simple test suggested by Javal. He causes the person to read while a ruler is held three or four inches from the face, and directly in front of the nose. As part of the print is concealed from each eye by the ruler, it can be read continuously only by the use of both. An elegant but most difficult means of detection is afforded by the stereoscope (Schweigger, *N. Y. Med. Jour.*, Feb., '66). A test that has proved very satisfactory in my hands, is one that I first employed in a case reported in the *American Journal of Medical Sciences* for October, 1873. It consists in placing a strong convex lens before the well eye, and requesting the patient to read print held considerably beyond its focal

distance. If he reads at all he must read with the blind eye, as the lens used in this way excludes distinct vision from the other as effectually as an opaque screen. Suspicion is less apt to be excited if the trial frames are used with a glass of low power before the blind eye. This simple test not only establishes the fact of vision, but enables us to determine its degree, and even to measure the accommodation. Three of my patients were detected in this way; in one case, at least, after a careful trial of the prism test had completely failed.

When blindness of both eyes is simulated, we are, of course, deprived of any optical means of detecting it. Etherization, as suggested in an article on malingering by Drs. Mitchell, Morehouse, and Keen (*American Journal of Medical Sciences*, Oct., '64), might prove successful. They found it so in deafness; and a case of hysterical deaf-dumbness was detected and cured in this way, some years ago, by Dr. Hutchinson, at the Episcopal Hospital.

These cases of hysterical blindness offer a curious and most interesting psychological problem. In some there is evidently a more or less deliberate deception, the result of an insane craving for sympathy or personal importance, or the motiveless freak of a disordered mind. Patients of this class are like the fasting girls who develop a superhuman ingenuity in the effort to make it appear that they live without eating. One of the patients referred to, after obstinately maintaining the deception for two years, abandoned it at once on detection. In the case of others, however, the charge of intentional deception can by no means so easily be maintained. Indeed, a careful consideration of their other symptoms, their surroundings, and their previous good character, is almost enough to acquit them of acting a part. I have sometimes suspected that, though they read well enough unconsciously, they might not be capable of conscious vision with the affected eye; that there might be some mysterious derangement of the process of perception —a kind of negative hallucination, if such an expression could be allowed.

Though it is often a comfort, in doubtful cases, to remem-

ber that patients are not always what they seem, we cannot be too careful to avoid classifying a case as "nervous" until every possible organic change has been rigidly excluded, or supposing that we have really explained our patient's symptoms when we have called them hysterical. It is too often true that, as Charcot says, neuroses bear within them the germs of material lesions, and that a disease, apparently nervous, may at any moment become an organic disease.

The ophthalmic surgeon meets daily with patients whose symptoms not many years ago might well have been classified as hysterical, but whom the deeper knowledge gained by the ophthalmoscope and optical tests now proves to have a substantial basis for their complaints. Doubtless the limits of this convenient term will be still further restricted, in proportion as our knowledge of pathology expands and our means of accurate diagnosis are extended.

The discussion on Dr. Harlan's paper was opened by Dr. WM. F. NORRIS, who said he agreed with Dr. Harlan in regard to the importance of hysterical eye symptoms. He thought we should be on our guard in making the diagnosis of hysterical eye affections, particularly as central organic nervous disease was sometimes present without optic atrophy or other ophthalmoscopic appearances.

Dr. WM. THOMSON said he was much interested in Dr. Harlan's paper. He had, however, recently adopted a special method of treating hysterical eye affections. He said he had a case some months ago—a woman, who was blind in her left eye. The eye-ground was normal. She had frequent hysterical attacks. She was deaf in one ear, could not taste or smell, temperature abnormal, skin pallid, and there was loss of sensation in one half of the body. About that time Burquism or metallotherapy was brought to his attention. He tried it in this case, and found that iron was the metal to which she responded. He put her on this and she gradually recovered. Her sight returned. This woman's circulation was poor on the left side. He thought that circulatory disturbances were often at the root of these hysterical conditions, and that the application

of appropriate metals had a decided effect in such disturbances.

Dr. WM. S. LITTLE said, in no class of diseases does the physician feel the necessity of knowing how to handle all the "scopes," in order to exclude or recognize diseased conditions, as in these cases of hysteria. It has been my habit to classify these cases as follows: Cases of hysteria manifested in the eye alone, without any lesion in the eye or elsewhere in the body. Cases of hysterical manifestations in the eye, with lesions elsewhere in the body and none in the eye. The same, with lesions elsewhere and in the eye. Another class of cases with hysterical conditions in other parts of the body, due to ocular conditions. The first class of cases are rare, and a few kind words or a little electricity may suffice for treatment; but in the other cases, to decide on the proper plan of treatment calls for more discrimination, and these cases will go from physician to physician till they may even, as the author of the paper says, fall into the hands of the gentlemen who divide the internal rectus.

Dr. WM. OSLER mentioned the case of a girl suffering from hysterical blindness in the London Hospital in 1873. Various tests were employed without success. One of the surgeons suddenly held up before her a large frog, which caused her to scream and roundly abuse the doctor, and immediately cured her of her blindness.

Dr. CHARLES K. MILLS said that the tendency, during the discussion, seemed to be to regard all cases of hysterical blindness as due to unmitigated shamming. While simulation was an element in many cases of true hysteria, and while in what might be termed pseudo-hysteria it was the chief or only element, all cases of hysterical blindness, or of other hysterical sensory disorders, were not to be explained in this way. The activity of the cortical areas concerned with conscious perception was in abeyance in many of these cases. Sudden and unexpected impressions aroused these centres to action, and thus accounted for the sudden cures, which were regarded as instances of detection of imposture. Imposture was present sometimes, but not always.

Dr. LOUIS J. LAUTENBACH said that in connection with the subject under discussion, he would briefly report the following case:

A colored woman, twenty-six years old, a cook, strong, stout, and apparently healthy, presented herself, with a history of sudden loss of sight two days previously. Vision of her right eye was $\frac{5}{6}$; left eye counts fingers at one foot. It improved by glasses. The optic nerves were very slightly pale, the vessels normal. Both eyes were hypermetropic; the right slightly more than 2 D., the left somewhat more than 1 D. The left iris was dilated, not reacting to light. She was placed on iodide of potassium, 3 grs. in compound tincture of gentian, three times a day. On the 20th inst. her vision in the left eye was $\frac{4}{60}$; on the 22d inst. $\frac{5}{6}$, and on the 24th $\frac{5}{4}$. She was profuse in her expressions of gratitude for, as she considered it, her wonderful recovery.

Dr. S. D. RISLEY said he felt indebted to Dr. Harlan for calling attention to the hysterical affections of the eye. He thought, however, that in ophthalmic practice it was peculiarly difficult to draw the line between hysterical symptoms and those having a distinct pathological basis or a physiological anomaly to explain them. The intricate anatomy of the eye was such as to render its proper performance of function especially liable to be influenced by many derangements of the general system. The state of health underlying the group of symptoms characterized by the term hysteria was especially prone to effect a disturbance of the visual function. The disturbance, however, differed from the ordinary manifestations of hysteria, in that the symptoms had a demonstrable physical cause, were beyond the control of the patient, and were constant during the existing state of health. Thus the feeble innervation of the hysterical patient was liable to diminish the range of accommodation and power of convergence, rendering the comfortable use of the eyes impossible. Again, the feeble or deranged circulation in the hysterical individual may set up a group of symptoms in the eye presenting many of the characteristics of serious disease—which, however, are not simulated, but are, in fact, a relative glaucoma. While there is no absolute increase of intra-ocular tension, the normal tension of the eyeball is sufficient to interrupt the

entrance of the feeble blood stream into the eyes, and thus is set up the same group of symptoms as are present in actual increase of tension, viz., inadequate blood supply to the retina, contracted field of vision, impaired central perception, diminished range of accommodation, inability to use the eyes, particularly at a near point.

Dr. J. T. ESKRIDGE presented a paper on, "A Case of Tumor of the Cerebellum with Monocular Hemianopsia." (See p. 1.)

LEWIS BRINTON, M.D., *Recorder.*

Reviews and Bibliographical Notices.

Clinical Lectures on Mental Diseases. By T. S Clouston, M.D. Edited by Dr. C. F. Folsom, Boston, Mass. Philadelphia : H. C. Lea's Son & Co., 1884.

The present work has as its object the treatment of mental diseases from a clinical standpoint. The author is aware of the deficiencies of this method, but holds that direct appeals to facts of nature more impress students than do systematic descriptions. The first chapter discusses the necessity for psychiatrical knowledge by the profession. The symptomalogical classification adopted by the author is as follows :

1.—States of Mental Depression (*Melancholia, Psychalgia*).

A. Simple Melancholia.
B. Hypochondriacal Melancholia.
C. Delusional "
D. Excited "
E. Resistive "
F. Convulsive. "
G. Organic. "
H. Suicidal. "

2.—States of Mental Exaltation (*Mania, Psychlampsia*).

A. Mania Simple.
B. " Acute.
C. " Delusional.
D. " Chronic.
E. " Ephemeral.
F. " Homicidal.

3.—States of Regularly Alternating Mental Conditions.

A. Folie Circulaire (Psychorhythm, Folie à Double Form Circular Insanity).
B. Periodic Mania.
C. Recurrent "
D. Katatonia.

4.—States of Fixed and Limited Delusion (*Monomania, Monopsychosis*).

A. Monomania of Pride and Grandeur.
B. " " Unseen Agency.
C. " " Suspicion.

5.—States of Mental Enfeeblement (*Dementia, Amentia, Psychoparesis, Congenital Imbecility, Idiocy*).

A. Secondary Dementia (following Mania and Melancholia).
B. Primary Enfeeblement (Imbecility, Idiocy, Cretinism, the result of deficient brain development or brain disease in early life).
C. Senile Dementia.
D. Organic " (the result of gross brain disease).

6.—States of Mental Stupor (*Stupor, Psychocoma*).

A. Melancholic Stupor (Melancholia Attonita).
B. Anergic " (Primary Dementia, Dementia Attonita).
C. Secondary Stupor (transitory after Acute Mania).

7.—States of Defective Inhibition (*Psychokinesia, Hyperkinesia, Impulsive Insanity, Volitional Insanity, Uncontrollable Impulse, Insanity without Delusion*).

A. General Impulsiveness.
B. Epileptiform Impulse.
C. Animal, Sexual, and Organic Impulse.
D. Homicidal Impulse.
E. Suicidal "
F. Destructive "
G. Dipsomania.
H. Kleptomania.
I. Pyromania.
K. Moral Insanity.

8. The Insane Diathesis (*Psychoneurosis, Neurosis Insana, Neurosis Spasmodica*).

The value of this classification is not great, and when further examination of the cases placed under it is made, this becomes plainly evident. The guiding principle is symptomatology, and yet this principle is not too well followed. The organic melancholia and the organic dementia are one and the same, as the emotional disturbance is common to both in a greater or less degree. The excited melancholia and the temporary frenzy have more in common than this last and mania. Melancholia attonita has only its outward expression in common with stupor. Some of the cases of monomania of pride and grandeur closely resemble one case of homicidal mania cited, in which the homicidal tendencies were not impulsive, but the outcome of the patient's delusions. Katatonia, an acute affection, has nothing in common with the types of insanity among which it is placed; they are the expres-

sion of heredity. Mania might with propriety have been placed in the seventh class, as in it the inhibitions are most decidedly weakened. The classification is therefore inconsistent and not at all adapted for scientific purposes. Under every one of its general are placed species whose characteristics entitle them with equal propriety to a place elsewhere.

In addition to this classification Dr. Clouston proposes the following "clinical classification":

1. General Paralysis.
2. Paralytic Insanity (Organic Dementia).
3. Traumatic "
4. Epileptic "
5. Syphilitic "
6. Alcohol and Toxic Insanity.
7. Rheumatic and Choreic Insanity.
8. Gouty Insanity.
9. Phthisical Insanity.
10. Uterine "
11. Ovarian "
12. Hysterical "
13. Masturbational Insanity.
14. Puerperal Insanity.
15. Lactational Insanity.
16. Insanity of Pregnancy.
17. " " Puberty.
18. " " Adolescence.
19. Climacteric Insanity.
20. Senile "
21. Anæmic "
22. Diabetic "
23. Oxaluric and Phosphaturic Insanity.
24. Cyanotic Insanity.
25. Metastatic "
26. Post-Febrile Insanity.
27. Insanity from Deprivation of the Senses.
28. " of Myxœdema.
29. " " Exophthalmic Goître.
30. Delirium of Young Children.
31. Saturnine Insanity.
32. Post-Connubial Insanity.
33. Pseudo-Insanity of Somnambulism.

The reader is left to make his choice between these two classifications. If he be psychologically inclined, he can use the first, which has all the disadvantages, with none of the merits, of the classifications of Bucknill-Tuke and Griesinger, not to speak of that of Hammond, which last is the most consistent. The other classification is a confused collection; it is not purely etiological, nor purely any thing, since it is not based on any broad principle. It may be stated that there are psychoses to which the cause gives a specific color, and there are others, arising from

different causes, which have the same features in common. If the etiological principle is to be used at all, these two great classes should be demarcated, and in this case there would be pure psychoses—that is, not tinged by their etiology,—and complicated psychoses, in which such tinge exists. It should also be remarked that the relation between epilepsy and hysteria and insanity is not an etiological one, but that the insanity is an expression of the constitutional condition which underlies these neuroses. Dr. Clouston has, following Skae, made some very finical subdivisions—the difference between post-connubial insanity and anæmic insanity.

The individual forms of this last classification, with some exceptions, are adapted to clinical use, as is shown by the use made of them by Dr. Hurd, of the Pontiac (Mich.) Hospital for the Insane, one of the ablest American clinical alienists.

Dr. Clouston at the outset lays down certain basic principles which, although not novel, summarize much that is habitually ignored by dilettante alienists. "Peripheral lesions and disordered functions," he says, for example, "may cause insanity, and *vice versa*. The action of mind on mind in healthy brains is direct, intense, and most subtle. The same is the case when the brain is disordered, and hence in psychiatry mental therapeutics are a most important means of treatment."

The second lecture discusses states of mental depression. In this lecture no reference is made to the fact that melancholia is essentially a depressed emotional condition. The second case is not a melancholiac, but belongs to the cases of deficient inhibitions; the most trivial incident occupied her mind, and she could not rid herself of it; she was decidedly dysbulic, and presented all the characters of an affection of the will-power, not of the emotions. On one occasion the patient had her progress arrested with both feet in a muddy pool, the cause of detention being the discussion with herself why she should not stand in that pool. The case reported on page 64 is not a case of melancholia possibly complicated by paretic dementia at all, but one of mental deterioration; the patient's memory was affected, and, as Dr. Clouston says: "He shows a mild dementia with a mild melancholia." It must be remembered that these are called by Dr. Clouston simple melancholia. The cases reported under hypochondriacal melancholia are mostly typical, and good instances of the psychosis. Delusional melancholia, according to Dr. Clouston, is a variety in which the delusions remain throughout the disease, and under this title all sorts of psychoses are considered, some as typical of hypochondriacal melancholia as any thing. Under the title of excited melancholia are described cases of true melancholia, instances of senile insanity, and of secondary dementia. Under resistive melancholia negative tendencies are described. Convulsive melancholia is simply larvated epilepsy with manifestations at rare intervals. Organic melancholia is not a melancholia at all, but a dementia. There is no reason for a

division of melancholia into suicidal and homicidal, as *all* melancholiacs are probable suicides and possible homicides. Stress is laid on feeding in treatment.

Under simple mania, Dr. Clouston describes fairly typical cases of hypomania, as well as cases of periodical insanity. The cases are, as a rule, much more characteristic than the melancholiacs. Acute mania is well described, and Dr. Clouston calls attention to the stupor which follows acute mania, and is so often regarded as an evidence of incurability. The following statement may lead to serious errors: "I never believe in the perfection of a recovery from acute mania, unless the patient is fat." Had Dr. Clouston added, "coincident with mental improvement," this would be all right, since dementia often shows itself in physical improvement unaccompanied with mental improvement. In this lecture he calls attention to the beneficial effects of carbuncles in some cases. Under acute mania, he describes two good cases of Bell's disease without demarcating them. His delusional mania is a mixture of agitated melancholia and mania becoming secondary confusional insanity. His chronic mania includes paranoiacs, cases of secondary confusional insanity, and other psychoses. His remarks on *mania transitoria* (transitory furor) are, in the main, well put, and his cited case typical, but this condition scarcely belongs among the manias. Under homicidal mania are described cases of the most distinct character.

His remarks on alternating insanity have already been cited in the JOURNAL OF NERVOUS AND MENTAL DISEASE.

His monomanias are usually amplifications of the old French ideas about monomania. His cases are well described, but he fails to recognize the basic principle underlying these psychoses, and has mixed up cases of paranoia and simple melancholia, as well as secondary confusional insanity.

The lecture on dementia does not call for comment.

Lecture VIII deals with stupor. Dr. Clouston has placed together, under this head, very diverse conditions: the condition which results from absorption in a delusion; from paretic dementia; from epilepsy, as well as stupor. Under states of defective inhibition, the moral and impulsive psychoses are considered at length. This chapter is one of the best in the book. Dr. Clouston, in whom the tendency to rely solely on his experience is well marked, affirms in the most decided manner that he has had cases under observation. Dr. Clouston is in error in stating that the insane diathesis differs essentially from primäre Verrücktheit. If there are two things that are the same in essence, these are, and the cases cited are apt illustrations in this direction.

The lecture on paretic dementia ignores certain important features; he claims that depression is always associated with visceral disease. He is of the opinion that there is no proof that it is syphilitic in origin. In his opinion othæmatoma, which he regards as a trophic disturbance of central origin, is frequent in this psychosis. By paralytic insanity (a bad and misleading name), is

meant insanity from coarse brain disease; but under it he describes a typical case of senile insanity, in which apoplexy fortuitously occurred.

His experience, as regards epileptic insanity, differs from that of the great majority of authorities, as he believes that *petit mal* is *not* so frequently accompanied by mental disturbance. His experience in traumatic insanity has been limited. The connection between syphilis and insanity in many of his cases of syphilitic insanity is merely coincidental.

The lectures on alcoholic insanity ignore one of the most typical symptoms of the chronic psychosis. The section on rheumatic and gouty insanity contains nothing new, nor newly put.

The section on phthisical insanity is one of the most interesting and valuable in the book. The lecture on uterine and ovarian insanity does not show that these psychoses differ from hysterical insanity. The lectures on the masturbatory, lactational, puerperal, hysterical, pubescent, and adolescent psychoses exhibit the usual faults and vices resulting from etiological classification. The eighteenth lecture contains much matter of interest, but the curious blunder is made of regarding Laura Bridgman as a case of idiocy. The book, as a whole, panders to a taste for the "practical," which is much too common. The author has not a philosophical mind, and as a result his observations are of value chiefly as detached facts. To the philosophical alienist the book is of value as a storehouse of isolated facts. For the use of the student and general practitioner, it is not to be recommended. The plates are coarse, and of no value. The book is typographically not up to the usual standard. J. G. K.

Physiologie des Muscles et Nerfs. Leçons professées à la Faculté de Médecine. Par CHARLES RICHET. Pp. 924. Paris: Librairie-Germer, Baillière, et Cie.

No more fascinating field of investigation offers itself to the physiologist than that of nerve and muscle. The chemical, the microscopical condition of nerve and muscle fibre, of nerve and muscle cell, are obvious; delicate instruments of precision record the results of the correlated parts; but underlying it all, ever eluding the pursuit of the most diligent student, is that subtle process evolved in cerebral cell, traversing nerve paths, diffusing through muscle tissue, which results in muscle action. With such a subject it is no wonder than Prof. Richet can spread before the reader nearly a thousand pages of experiments, deductions, and theories of his own and of others, and nevertheless apologize in his preface that his work cannot claim to be a complete treatise on the general physiology of nerve and muscle tissues.

The author takes in turn the muscle, the nerve, and the brain, and analyzes them, first histologically, then chemically, afterwards with reference to the effect of external agents under varying conditions of rest, action, and fatigue. The changes brought about by heat, electricity, and toxic agents are also shown. The interesting

and instructive myograms of Marey are reproduced in the chapters on muscular contraction, tetanus, and muscle excitability and in that upon elasticity, work, and force of the muscle. From his own experimentations he illustrates in the same graphic manner the traces obtained in cerebral excitability. This unifying process of the action of muscle, nerve, and cerebral cell excitability, is one of the most striking and interesting features in the book. "The myographic curves," he says, "give, in a manner, the schema of the law of reaction of the tissues. A muscular contraction is composed of three periods visible and capable of analysis, when a single electrical excitation is used. There is at first the latent period, then a period of ascension, then a period of descent. The duration of these three periods is correlative. If the muscle is fresh, if the excitation is strong, the three periods are very rapid; in the contrary case they are slow. Remark that the excitation is extremely short, since the duration of the electric spark is even less than the sixty-thousandth of a second. The response of the muscle is prodigiously long compared to the brevity of the excitant. Each excitation leaves then after it, a re-echo, a vibration more or less prolonged, and in every case longer than the excitation itself.

"It is not necessary that there may have been an excitation and a response to it, that the response of the muscle should be apparent; often there are attending conditions which mask the phenomenon. There are sometimes after a very short excitation a prolonged latent contraction. This latent contraction is none other than an augmentation of excitability; or, rather, we can make the phenomenon of augmentation of excitability return again in the phenomenon of latent contraction.

"If one passes from the muscle to the nerve substance, the same phenomena are found. Each excitation leaves after it a long impression. * * *

"For the higher encephalic nerve centres, the impression caused by a single excitation is even more lasting. A violent electrical discharge produces a painful shock, which lasts ten minutes or more."

This reasoning erects for the author, upon the material basis of his subject, a scaffold sufficiently lofty and strong for him to pass over into its most occult and difficult regions. All is made easy and plain. He thus continues:

"Indeed, more, because of the special perfection peculiar to the encephalic nervous system of superior beings, these excitations from without can fix themselves definitely in the intelligence, and be stored up there. This is the faculty of memory; for memory can be considered like a prolonged retention, almost indefinitely, of an excitation. Although the physiological explanation of this phenomenon may be yet extremely obscure, we can, however, compare the memory of the brain to the memory of the cord, and to the prolonged retention of a single, short excitation on the muscle."

He concludes thus: "That which was a presentiment to the penetrating genius of Descartes, modern science proves. Living beings are veritable machines—machines extremely delicate and complex, but machines nevertheless, which are arranged in such a manner that they react according to inscrutable laws to external forces. This necessary reaction of the being to changes gives rise to the impression that the apparent spontaneity of superior animals is only one of the modes of irritability, for although the living machine appears to produce force, it does not produce it spontaneously; never, except in response to an excitation from without. Its activity is only an activity of response; but, thanks to the accumulation in the organism of chemical forces of tension, the freeing of power brought about by an external impression is enormous, and out of all proportion with the external impression.

"Above all, the nerve cell (Encephalic) possesses an extreme latent energy; but it responds to an excitation according to the same laws as that of the nerve fibre and muscle."

It may be well, since the author has reduced every thing in connection with his subject to a question of irritability, to state his definition. He sets aside that of Virchow: "The property of living bodies, which renders them susceptible of passing into a state of activity under the influence of irritants—that is to say, of external agents"; and that of Claude Bernard: "Irritability is the property of a living element to act according to its nature under an external provocation"; and gives the following: "The property of a living element to react according to its nature to external forces which modify quickly its actual state."

The reader may think that we have made too prominent that portion of this extensive volume which deals with the metaphysical, and what must ever remain conjectural, to the exclusion of the physiologically practical. We have done so for two reasons. In the first place, because it is in this that the individuality of the writer and his work is most exhibited. It is in this field that his investigations have taken a unique and pleasurable turn. So much have his studies in connection with this work extended in this direction, that he thought to entitle it "Lessons on Irritability." In the second place, this prevailing idea is so artistically carried to its climax, that it fixes the attention and claims it.

Professor Richet is delightful in his style, and the reviewer would fain elaborate other portions of his work, did space permit. Especially interesting are his discussions of the theories of rigor mortis, muscle electricity, luminous insects, and electrical fishes, the chapters on pathological physiology of the muscles, the historical study of the nervous system, reflex action and the laws governing it. In fact the whole book is to be commended, and the purpose of this review will be fulfilled if it leads to its perusal.

G. P.

Traité des Névroses. Par A. AXENFELD. Deuxième Edition. Augmentie de 700 pages par HENRI HUCHARD. Pp. 1195. Paris.

Twenty years ago Axenfeld first publised his treatise on nervous diseases. He was about to rewrite and revise his work at the time of his death in 1876. One of his most faithful disciples and ardent admirers, M. Huchard, has undertaken what he calls, "the great and perilous honor of the revision." He states in the preface that he has endeavored to preserve in the book all its originality, to change nothing in the pages, which are often eloquent and alway's imprinted with a profound clinical spirit.

The editor has more than doubled the number of pages, an addition rendered necessary by the great scientific advance in this branch of medicine. These additions are always indicated to the reader that he may distinguish between the writings of the two authors.

The neuroses are divided into three great classes: Neuroses of Sensibility, Neuroses of Motility, Complex Neuroses. Among the most important additions may be cited—the study of the vasomotor disturbances, diaphragmatic neuralgias, tremors, special and general neuralgias, *migraine*, angina pectoris, vertigo, functional spasm, chorea, and hysteria.

Each subject is treated in the most complete manner. Preceded by a bibliographical list, the disease is defined, described from the beginning through to its termination. Its etiology is given, as well as its anatomical and physiological pathology.

Then comes an extensive discussion of the numerous theories if the disease is one of the functional neuroses. It is here that a broad philosophical and discriminating spirit is displayed by author and editor, and very enjoyable reading is furnished to the peruser. It is due to the uncertainty which gives rise to endless speculation and conjecture in reference to a large majority of nervous disturbances, that theories multiply well-nigh endlessly and greatly increase the bulk of volumes on nervous diseases, if it does not increase the knowledge correspondingly.

As twenty years ago Axenfeld's treatise came to take a place among the classical works on the subject of which it treats, so now this new and augmented edition lays claim not only to the place of the old, but that to which newer works would come with the intention of elbowing and jostling it as old and out of date.

G. P.

Legislation on Insanity. A Collection of All the Lunacy Laws of the United States and England, Legislation in Canada on Private Houses, and Important Portions of the Laws of Germany, France, etc. By GEO. L. HARRISON, LL.D., Late President of the Pennsylvania Board of Public Charities. Philadelphia: Privately printed, 1884.

The author of this volume states, respecting its nature and objects, that: "This publication, which presents all the existing

Legislation on Insanity now in force in the most civilized nations, will give an opportunity to each of our Commonwealths to review its laws on this subject, compare them with those of other States, and amend, if found unsuitable or insufficient. Several States have been named in the preface, whose laws are worthy of review in such an undertaking. The question of the care and treatment of the Insane has received great attention, of late years, in a number of our Commonwealths, and the public mind, being well prepared to consider and determine their interests and their rights, have influenced Legislatures to discard many mischievous and worthless laws, and enact others more consonant with the spirit and intelligence of the hour. His present purpose is to effect this merciful policy with the Legislatures of the States and Territories of the U. S., and he trusts that the simple method suggested. with the means to accomplish it, gratuitously furnished, will be willingly adopted. The beneficial results will soon appear to the quick relief of the helpless, and the ultimate satisfaction of all who have the care of them. It will be admitted that no class of the wards of a State merits or requires more humane and protective legislation than the Insane." The *aim* of the work is therefore to be commended, but the *means* of accomplishing its ends naturally call for examination. The author, who is not an alienist nor a physician at all, tells some stories bordering on the very sensational in his preface, and fails to comprehend that hospitals for the insane are places of treatment, not prisons. His cited instances do not, as a rule, show that the persons described were improperly sent to hospitals for the insane, while it may be admitted that they were too long retained there. If the latter be the case it was due to one of three causes: caution on the part of the superintendent; carelessness on his part, arising from the prevalent conception on the part of superintendents, that they are administrators and not scientists ; mercenary motives on the part of the superintendent. The burden of proof rests to an enormous extent on him who assigns the last cause, but it must be admitted that though medical politicians, like those who so flatly contradicted the dicta of science at the Guiteau trial, and men like Superintendent May of Danvers, who was expelled from the Mass. Medical Society for disreputable conduct, are not above such considerations, not a single instance of the influence of such considerations has yet been proven. That superintendents do neglect to examine their patients was shown in the testimony taken by the committee which investigated the Utica Hospital for the Insane, and by the evidence taken in one of the habeas corpus cases in New York City. Caution is commendable, and an error on the side of caution in discharging an, at one time, dangerous lunatic is praiseworthy. The remedy for such evils is not one which hinders the entrance of patients in asylums, but one which watches over them while there. Dr. Harrison adopts the doctrinaire ideas of free communication between the insane and the outside world. The absurdity and dangers of such communication were shown by two

instances cited in the tenth volume of the JOURNAL OF NERVOUS AND MENTAL DISEASE. Dr. Harrison seems to believe that intelligent, conscientious business men are good judges of insanity ; considering the numerous instances in which these people are deceived by the insane in pecuniary transactions (for which see Periscope, October, 1882, and April, 1884, JOURNAL OF NERVOUS AND MENTAL DISEASE), the absurdity of such "experts" is sufficiently manifest. Dr. Harrison recognizes the fact that insane criminals and the criminal insane should not be placed in the same category, and is in favor of providing for the insane criminal separately from the other insane. He, however, shows his ignorance of the psychological basis of such distinction by proposing that the patient, on the expiration of his sentence, should be sent to an ordinary hospital for the insane. He considers the New York, Wisconsin, Pennsylvania, Iowa, and Massachusetts laws worthy of commendation. The late legislative report respecting the Utica Asylum shows that the New York laws do not provide in the best manner for proper supervision of hospitals for the insane. The fact that in Iowa there is competition and even bribery of commissioners for the location of new hospitals, shows that the laws of that State are not in a model condition, not to speak of the fact that the chronic insane are badly provided for in consequence of legal provisions. The disgraceful episodes of the construction and early management of the Danvers Hospital for the Insane show that Massachusetts lunacy laws do not protect the insane in the best way. The condition of the insane in the Blockley Almshouse, and the frequent executions of lunatics, show that in Pennsylvania the insane are not properly protected by law. The Wisconsin law is probably the best law on the statute-books; but even it does not sufficiently provide for the proper legal method of discharge ; even it throws too many hindrances in the way of early treatment. With the exception of the last law every law commended by Dr. Harrison is fatally defective, and if such be the case with these laws, what must be the nature of the laws of the States not held worthy of commendation. The preface of this work panders too much to the sensationalism of the time, and presumes physicians to be guilty of disreputable practices because their innocence is not proven. Dr. Harrison states that the "social experiences of the inmates of almost all hospitals for the insane are of a nature to induce insanity where it does not exist, and to drag down to irremediable madness the unhappy victims of such companionship as they are consigned to in those institutions." It has been stated at the outset that Dr. Harrison was not a physician, and this very citation proves it. He does not understand that the social surroundings of the patient's life foster if they do not induce his insanity, and it is through the radical change from these that the hospital for the insane proves beneficial. Dr. Harrison is here guilty of a little inconsistency. He objects to the social surroundings of the patient in the hospital for the insane and yet proposes to make these worse by placing the insane

criminal, whose sentence has expired, in the ordinary hospital for the insane. While this compilation cannot be said to possess much originality, it has some value as a work of reference, but the author's knowledge of psychiatry is so limited that his preface is calculated to injure the very class whom he desires to benefit.

J. G. K.

Opera Minora. By E. C. SEGUIN, M.D. Edited by R. W. AMIDON, M.D. New York: G. P. Putnam's Sons, 1884.

Dr. Seguin has collected in this volume his contributions to periodical literature during the past eighteen years, thus rendering them readily accessible to the profession. The opening paper is on the thermometer in medicine, and is reprinted from the *Chicago Medical Journal*, May, 1866, and at this date does not call for comment. The same is true of the next two papers, reprinted from the *New York Medical Journal*, August and December, 1867, and the fourth paper written in 1870. The fifth paper on the aphasia question, published in 1868, is of decided interest, albeit, forty-six of the cases cited were, as Dr. Seguin admits, very imperfectly noted. A case of trichinosis, reported in 1868, is at this date of historic interest only, and the same remark applies to the next case-report on ocular œdema. The case of probable lesion of the lateral half of the spinal cord, resulting in left hemianæsthesia and right hemiplegia, was not supplemented by an autopsy, and a cerebral element cannot therefore be excluded.

The history of the case of "mania" is defective, and whatever the psychosis might have been, it certainly was not mania. Judging from the mixed, silly grandiose, and persecutory delusions, the apoplectiform attacks, and the results of Dr. Seguin's careful autopsy, the case was one of impure paretic dementia.

Two carefully reported microscopical examinations follow, but do not possess features calling for criticism; one is an examination of a double central canal in the spinal cord of a paretic dement. The next case, one of paretic dementia, is very carefully described, but does not present any thing novel except the statement that Dr. T. R. Pooley found atrophy of both optic disks, secondary to optic neuritis, during life, and Dr. Delafield found both optic nerves, on microscopic examination, absolutely normal; a curious contradiction.

The lecture on infantile spinal paralysis is a good résumé of the knowledge of the subject up to the date at which it was written. Excision of the cords which go to form the brachial plexus in a case of traumatic brachial neuralgia is the subject of the next paper. It must be remembered that this operation was planned by Dr. Seguin and executed by Dr. Sands before the present furor for nerve-stretching and excision existed.

The paper on the inhibitory arrest of sneezing is interesting; but the procedure, forcibly rubbing the skin below and on either side of the nose, is not followed by invariable success, and does not differ in its effect from the inhibition produced by suddenly

changing the course of ideas of the person who is about to sneeze. The papers on tetanoid paraplegia are among the most valuable in the book.

The lectures on the general therapeutics of the nervous system deserve perusal. Dr. Seguin evolves from his internal consciousness the rather peculiar theory that "food is a depressant because it remedies the morbid irritation produced in the brain in cases of exhaustion whether from hemorrhage or over-work." If such be the powers of a depressant then food is a depressant, but it appears from the next paragraph that alcohol does the same thing, and Dr. Seguin, in that paragraph, calls alcohol a stimulant. Anstie has shown that food and alcohol are both, in the true sense of the term, stimulants, and Dr. Seguin is evidently biassed by the popular meaning of the term stimulant. The lecture on the physiology of the nervous system does not call for comment. The paper on hysterical symptoms in organic disease, is a contribution of great value in the sphere of differential diagnosis. The next paper is a case-report containing nothing novel.

The next six papers have appeared as a whole or in abstract in the JOURNAL OF NERVOUS AND MENTAL DISEASE, and are sufficiently familiar to the readers of this journal.

The lecture on syphilitic cerebral lesions is biassed by Dr. Seguin's belief in Hübner's dicta regarding luetic arteritis; dicta which have since been proven not well based. The lectures on localization of cerebral and spinal lesions are an excellent résumé of the knowledge of the subject up to the date at which they were written. In the lecture on locomotor ataxia Dr. Seguin points out very carefully the relationship between this disease and paretic dementia,—a relationship much ignored by those who discuss the differential diagnosis of these two neuroses.

The next four papers have appeared in abstract in this JOURNAL. The untoward renal effects of potassium iodide are discussed in the next paper. Dr. Seguin makes no reference to the fact that Rilliet, Rodet, Simon, Regnard, and others had previously pointed out the same effects of potassium iodide.

The next paper reports two cases described as *folie à deux*, but these are simply, as was pointed out in the JOURNAL OF NERVOUS AND MENTAL DISEASE, October, 1881, cases of melancholia arising in sisters. There was no inter-communication of insane ideas. They are cases of *folie simultanée*, but are certainly not cases of *folie à deux*. Dr. Seguin has been misled by Dr. Lasègue, who puts such cases under *folie à deux—communicated* insanity, with which, psychologically, they have nothing in common. In the one there is an inter-communication of insane ideas; in the other there is none.

The next five papers do not call for comment. The paper on subacute transverse myelitis and optic neuritis has already appeared in the JOURNAL OF NERVOUS AND MENTAL DISEASE. A case of mysophobia is then reported. Occipital headache and uræmia are then discussed in their inter-relations. The next

paper discusses a case of cerebral abscess. The paper on early diagnosis of the organic neuroses makes some very positive statements about the early appearance of ataxia in tabes dorsalis which do not agree with the reviewer's experience.

The paper on hyoscyamia as an hypnotic and depresso-motor is not of much value, as the use of hyoscyamine in the psychoses is not clearly indicated, and nothing is said of its contra-indications and untoward effects, which are exceedingly frequent. The statement is made that in delusions of suspicion it has produced a positive cure. As was said in the JOURNAL OF NERVOUS AND MENTAL DISEASE, October, 1881, p. 790: "Which type of delusions of persecution is meant? The one found in paranoia resulting from incarceration in an hospital for the insane, or some similar logical reason?; the one found in melancholia?; or the one found in paretic dementia? The delusion in paranoia is a somewhat complicated process of thought, and can any one claim that this can be swept away by a single drug? The idea is absurd; as well might one have attempted to remove the 'terror' of the French during the first Revolution by doses of hyoscyamine. Melancholia is a condition in which all mydriatics are strongly contra-indicated, and on it hyoscyamine could have but a depressing effect. The delusions in paretic dementia shift and vary so much that it would be difficult—nay, almost impossible—to prove that their disappearance was due to any one drug." As was very well said by Dr. D. R. Brower (*American Journal of Neurology and Psychiatry*, 1883), hyoscyamine is a therapeutic fashion just now.

The next paper calls attention to the fact that tabetic patients are peculiarly insusceptible to aconitia. The next four papers have appeared as a whole or in abstract in the JOURNAL OF NERVOUS AND MENTAL DISEASE. The paper on the early recognition of epilepsy shows that even well-informed practitioners fail to recognize epilepsy. Dr. Seguin points out that these errors are due to a physiological misconception of the duration of the tendency to convulsibility and an etiological misconception resulting from the over-estimation of the exciting powers of local, internal, and peripheral causes. Dr. Seguin has certainly rendered a great service to the profession by this careful paper. Like the great majority of alienists and neurologists, Dr. Seguin is impressed with the incurability and psychic dangers of *petit mal*. The lectures on methods of diagnosis in diseases of the nervous system contain a great deal of information in a very concise form. The paper on potassium iodide in the non-luetic neuroses has already appeared in this JOURNAL in abstract. The paper on efficient dosage contains hints of great value. The next five papers on choked disk, injury to motor area of the brain, vertebral cancer and paraplegia, arsenical paralysis, and bromine ulcers are familiar to the readers of the JOURNAL. The two papers on aneurism and neuralgia do not call for comment.

Two cases of glycosuria (one real, one simulated) are then re-

ported. The first is stated to have consulted Dr. Seguin for "moderate dementia"; she was fifty-one years of age, and six years previous had an attack of "quite acute melancholia." "No positive delusions or hallucinations" existed, but the patient "fancied her arms were paralyzed, and wanted them cut off." Sugar was unexpectedly found in the urine, and disappeared the next morning. The second case was an hysteric, who put cane-sugar into her urine. The first case was probably one of true hysterical glycosuria, and is not unique.

The note on cerebral topography contains some hints of value. Dr. Seguin next discusses "mild" melancholia. The meaning attached to the term "mild" is not clear. Dr. Seguin certainly does not mean melancholia raisonnante, for the first case has hallucinations, and may be either a case of periodic melancholia (which has not, as Dr. Seguin seems to believe, a tendency to dementia) or epilepsy. It is an almost exact copy, except that the melancholia is not so well marked, of an epileptic case reported by Dickson ("Medicine in Relation to Mind," p. 134), in which an "alienist" diagnosticated melancholia with lucid intervals. Dr. Seguin says that the bromide treatment had no effect in his case, and uses this as an argument against its epileptic nature, but, as he has previously admitted, "*petit mal* is very rebellious to treatment by bromides." The boy did "many disagreeable things—whistling, crowing, stamping, kicking"; his case had a traumatic origin; he lost consciousness once, and "his father, an unreliable witness, thought he twitched." In one attack he was dull, drowsy, and restless, spoke slowly, and many parts of the body were the seat of *twitching*. He was placed under *ergot*, and during this time had *fewer* attacks. It is difficult to make any other diagnosis in the case than epileptic insanity; it was certainly not melancholia of the periodic or any other type. The doctrine taught in this paper is a dangerous one; the melancholiacs are the most suicidal of all cases, and while they may be treated at home, it is a measure attended with great risk. Dr. Seguin's remarks on the disadvantages of potassium bromide in melancholia are too mildly put. The last paper is a well-written defence of specialties in medicine.

In collecting his scattered essays in this manner, Dr. Seguin has been of great service to the profession. The book is markedly unequal; its weakest part are the contributions to psychiatry and the anatomo-pathology of the psychoses. The therapeutical contributions are of great value. The neurologist and particularly the general practitioner will find himself well rewarded by the purchase and perusal of this work. The editor's work is not in any way remarkable for the ability shown therein, the arrangement of the papers not being at all systematic. The typography of the book is excellent, but the uncut pages are a disagreeable anglomaniacal imitation. From the standpoint of a bibliophile uncut pages may be desirable, but the present work is intended for perusal, and not for museum purposes alone. J. G. K.

An Introduction to the Study of the Diseases of the Nervous System. By THOS. GRAINGER STEWART, M.D., Professor of the Practice of Physic and of Clinical Medicine, University of Edinburgh, etc., etc. Bell and Bradfute, Edinburgh, 1884, xvi., 237.

Prof. Grainger Stewart is well known as a brilliant lecturer and a profound writer upon general medicine. It was hardly to be expected, however, that one whose interests are so general, should display such a minute knowledge of neurology as is evident in the pages of this work.

The advances in the anatomy and physiology of the nervous system have been so rapid of late that a view of the subject entirely different from that presented in the older books has become necessary in order to introduce the student to the study of nervous diseases. Methods of teaching the anatomy of the brain have been perfected which are superseding the former system, and the student is now taught to trace tracts through the central nervous system, where formerly he learned merely to distinguish masses of white from masses of gray matter. Knowing the course and function of a given tract, he is then able to locate a lesion which interferes with the function. The division of such tracts into association and projection systems, first proposed by Meynert, is steadily gaining recognition, and complex symptoms, partly mental, partly physical, are being made clear by a study of the function of nerve cells and the course of nerve fibres. The physiology of the brain is another department of neurology in which progress has been equally rapid ; and as the day approaches when cerebral localization is to become the basis for cerebral surgery, a familiarity with its interesting facts and problems is indispensable to all medical students. It is not to be wondered at, therefore, that in beginning a course of lectures upon nervous diseases, Prof. Stewart should have found it necessary to introduce the subject by a review of some of the advances in these departments. The summary which he gives in the first seventy pages is concise and clear. It puts the student in possession of just those facts which he needs, without burdening him with disputed theories. The understanding of a somewhat complex subject is greatly aided by diagrams and photographs ; the execution of the latter, however, being less satisfactory than that of the former. This portion of the book can be recommended to those who have not the time or inclination to search for the facts in the original sources.

The sensory and motor functions are next considered, and in connection with an explanation of the physiology of each organ, based upon its anatomy, there is to be found a discussion of the disturbances of function which occur in the course of nervous disease. Here the wide clinical experience of the author enables him to relate interesting instances of abnormal conditions, not with the minuteness of a detailed case, but with an easy reference which never fails to hold the attention. The description of disturbances of vision may be selected as an example. Defects in

the visual field, with their anatomical causes, color-blindness, the varieties of dimness of vision, alterations in the pupil, the nervous symptoms produced by myopia, etc., are clearly discussed, and the lecture ends with a careful description of the retinal changes occurring in optic-nerve atrophy, and in optic neuritis, illustrated by eight colored plates taken from Liebreich's Atlas. Eye symptoms are so frequently observed in the course of nervous diseases, and are so important as points of diagnosis, that they deserve the space devoted to them, and the symptoms are here presented in such simple language that one does not need to be a specialist to understand them. In the lecture upon motor functions, the causation of various forms of paralysis is discussed, and the points of differential diagnosis between the different varieties are summarized. The subject of electricity in diagnosis is clearly presented—the author following closely the statements of Erb.

The chapter upon trophic and vaso-motor functions is especially satisfactory. Attention has recently been directed to the changes in nutrition and appearance of the skin, hair, nails, muscles, bones, and joints which develop in the course of various forms of myelitis and in locomotor ataxia. The numerous articles scattered through the foreign journals are not easily accessible to the general practitioner, and therefore this summary of the facts hitherto established will be of great service. A number of interesting cases are also reported, which make the lecture a valuable contribution to the subject.

It is something of a surprise to find a Scotchman passing over the psychological side of medicine without an elaborate discussion of the connection of mind and matter. The students at Edinburgh can attend, it is true, the profound lectures of Prof. Calderwood,—the distinguished successor of Sir William Hamilton, from whom there can be no lack of instruction as to the relations of mind and brain. It would have added, however, to the attractiveness of this volume, as well as to its completeness, if Prof. Stewart had devoted more space to the subject of mental symptoms. There are many facts connected with the subject of aphasia, for example, which might have received a fuller discussion. The varieties of this disorder are, it is true, illustrated by interesting cases graphically presented, but there is wanting a clear division and classification of the various forms—such as has recently been given by Lichtheim. Prof. Stewart's diagrammatic scheme, in explanation of aphasia, is original and ingenious. It is questionable, however, whether the intelligence- and will-centres are to be separated, and whether the known symptoms cannot all be explained without the existence of a will-centre, independent of the speech- and writing-centres. It is certainly incorrect to trace the tract from the ideational centre to the speech-centre through the word-hearing-centre, as Kussmaul does, inasmuch as the latter may be separated from the former without impairing the power of voluntary speech. This error Stewart avoids. An interesting case of one form of paraphasia is related by the author, as follows :

"I was one day demonstrating, in the clinical class, a case of aphasia. He had failed to repeat words which were said in his hearing. I said to him: 'Say "No."' He made a great effort, bringing many muscles into play in his attempt to do as I wished. Then he found it was hopeless, and, giving up the attempt, shook his head and said 'No.'" This is a good example of the aphasia of conduction of Wernicke, in which both sensory and motor speech-centres were normal, but the tract joining them was impaired. Repetition of a spoken word was impossible, but volitional language could be used. This is a condition which Kussmaul's diagram does not cover, but which Stewart's may cover, if we trace a tract from the intelligence-centre directly to the speech-centre. But his explanation of the case, as one of automatic speech, is hardly adequate. The existence of an "intelligence-centre" is necessary upon the diagram, and the statement is made that its seat is unknown, but had it been added that it must be used to represent the assemblage of memory pictures which are associated together to form a unit, and therefore that it has no single location, the author would have safely avoided the extreme materialistic position which may now be ascribed to him. It is perhaps unjust to demand an exhaustive discussion of aphasia in a book of this kind. It is to be hoped that the subject may form one of the series of Clinical Lectures on important symptoms which the professor is now publishing, since it is evident that his observations upon such cases have been numerous and carefully made. The chapter is an entertaining one, but would have gained by increased length.

The treatment of nervous diseases is briefly alluded to in closing. Here, too, Prof. Stewart has been too concise. It is true that the majority of practitioners are skeptical upon this subject, and look with suspicion at statements of remarkable results. But the experience of a well-known clinician is of great value, and we could have wished for more than a list of the drugs which the professor has found of use. The statements regarding the use of electricity are definite, and the rules for the use of the faradic and galvanic currents will be of service to those who hesitate between the two, not knowing when to use either. The author has less confidence in the use of the cautery than the Germans and French have, and upon this point we must incline to the Continental view. Nor can we admit that in spinal curvatures the clumsy and heavy apparatus of the English makers is to be preferred to the Sayre jacket when that is skilfully applied. Trephining is recommended in cases of Jacksonian epilepsy and in cases of an increase of intracranial pressure from tumors or chronic hydrocephalus, for the relief of the severe headache attendant upon that condition.

The book is certainly an admirable one, and will be found of much value by the student or the practitioner as an introduction to the more extensive works of Ross or Erb. It does not deal with the various forms of nervous disease, but enables one to study those forms with more profit and interest. M. A. S.

Editorial Department.

BLOCKLEY ALMSHOUSE.

THE fate of the ten or more lunatics who perished during the recent fire at Blockley Almshouse deserves more than a passing notice at our hands. Every one having the interests of the insane at heart will join us in a solemn protest against the mismanagement of that institution. The possibility of a fire breaking out in the insane wards of the almshouse must either have appeared incredible to those in charge of the asylum, or else we must suppose that the authorities wilfully jeopardized the lives of those entrusted to their charge. As a matter of fact the authorities were distinctly forewarned by the consulting staff of the Insane Department. In a report signed by Drs. S. Weir Mitchell, H. C. Wood, and Charles K. Mills, the arrangements of the asylum were severely criticized, while the scenes which would be enacted in case of fire were predicted with remarkable accuracy. We quote from that report :

"On the men's side the wards, so far as concerns escape from fire, are essentially the same on each of the three floors. In order to get to the fire-escape from the large general sleeping-rooms, it would be necessary to pass through four doors, each of them always kept locked. Several of these doors are not sufficiently large to allow two large men to pass easily at a time, and three of them open into corridors, so that should an uncontrollable rush be made towards the point of escape, the whole mass of sixty panic-stricken lunatics would jam against the the first door, which would have to be opened against them.

"If this door were opened through, the patients would then be joined by the inhabitants of the ward, or so many of the latter as could get out of their cells, and at each successive door the jamming and difficulty of passage would be increased by the con-

tinued augmentation of numbers. There is but one night watchman for the whole building, and there are no means by which he, without leaving the building, could raise a general alarm in case of his finding a fire, and when it is remembered that the process of liberation would have to be done upon three floors that are separated by locked doors, it is plain that the old man who acts as watchman would have his hands full to awaken the nine attendants on these three floors, and these attendants would require to be remarkably cool-headed to control the 260 lunatics and unlock the twelve corridor doors and the sixty cell doors."

And then, again :

"We find that the locks require several keys, and are, from long usage, difficult to open, and require several minutes when there is no cause for a panic. * * *

"The probabilities of the destruction of life in case of fire is further manifest, when it is remembered that upon the fourth floor are lodged between twenty and thirty paralytics, who could not help themselves easily ; that the whole building is very combustible and not at all fire-proof ; that the single watchman would, like enough, be in the beginning paralyzed in deciding to choose whether to attempt to get out the people or to put out the fire ; that there is not a fire plug, a foot of hose, or a fire extinguisher in the whole building ; and that in the upper stories there is no certain supply of water. To sum up, in a very combustible building with 260 lunatics and thirty disabled paralytics on the fourth floor, controlled by seventy-five locks with various keys, besides numerous latches, there is but one night watchman, and he is said to be infirm, to discover the fire and alarm the people, and there is no means provided to raise a general alarm. There are only nine attendants to control the patients and open the doors, no apparatus to extinguish the fires, and no one to use such an apparatus unless it be the lunatics themselves and some untutored employés, who, we believe, mainly sleep away from the wards."

The consulting staff proposed the necessary changes ; but their recommendations fell upon deaf ears. The result is well known to all. We suspect that the Blockley Almshouse is not the only institution in which such an accident could have occurred.

NEW YORK MEDICO-LEGAL SOCIETY.

In his retiring address as President of the Medico-Legal Society, Mr. Clark Bell gives a very gratifying report of the progress

made by the society. This progress is marked not only by the increase in membership and the growth of the society's library, but also by the character of the subjects discussed at, and the greater interest taken in, the meetings of the society. Through the *Medico-Legal Journal*, the mouth-piece of the society, the influence of the latter has been extended beyond the limits of this city and State.

The President referred in his address to the necessity of reforming the Lunacy Statutes of this state. He suggests that the Governor of New York appoint a commission (consisting of men able to decide on this question), who should be asked "to report such changes in our Lunacy Statutes as are demanded by the exigency of the times, and the needs of that defenceless class who, not able to speak for themselves, have all the higher claims on our sympathy, our care, and our protection." If the society will take active steps in this direction, it will merit the recognition which the energy of its late President secured for it at home and abroad.

Prof. R. Ogden Doremus, the newly-elected President of the Medico-Legal Society, will, no doubt, be willing to help bring about the reform suggested by his predecessor.

LEGISLATION FOR THE INSANE.

THIS is the present topic of discussion in England, France, Holland, and the United States. The people of the United States have a great tendency to believe in the possibility of enacting laws which will execute themselves, and it is the general opinion among Americans that they are natural-born experts on every thing. In the present number of this JOURNAL is reviewed a work on the subject of legislation for the insane whose object is commendable, but the author, Geo. L. Harrison, LL.D., should have studied a little psychiatry before writing the same. He says that a medical superintendent's testimony in a case which is reported as a case of incarceration of a sane man was trivial to absurdity. If Dr. Harrison had studied medicine or science he would know that the absolutely trivial does not exist. To legislate properly for the insane requires some knowledge of them, and it is to be regretted that a man of the philanthropical spirit of Dr. Harrison should enter upon this task without knowledge.

Correspondence.

To the Editor of the Journal of Nervous and Mental Diseases:

My attention has been called by Dr. Spitzka to a misstatement in an article on "The Sensory Tract in the Central Nervous System," published in your Journal July, 1884. I desire to make a correction, as the views of Dr. Spitzka were unintentionally misrepresented. Owing to a misunderstanding of an article by Spitzka on the cerebellum,[1] it was stated that—"Spitzka holds that the cerebellum is a special cerebral segment for all the sensory tracts, in which they are temporarily deflected on their way to the cerebrum. He therefore favors the view of Wernicke as to the existence of a double decussation between the cord and the capsule for all fibres excepting those of the column of Goll" (p. 352). In re-reading the article, I find that this statement is not warranted. Dr. Spitzka does not assert that *all* the sensory tracts are deflected. The criticism which I made of the statement (p. 393) is, therefore, irrelevant, and cannot be applied to the position of Spitzka, although it does apply to that of Wernicke.

M. Allen Starr.

[1] *Alienist and Neurologist*, Jan., 1884.

Periscope.

a.—ANATOMY OF THE NERVOUS SYSTEM.

THE WEIGHT OF THE BRAIN.—Buchstab, under the direction of Prof. Lesshaft of St. Petersburg, has recently published (Inaugural Diss., St. Petersburg, 1884) the result of a series of observations upon the weight and size of the brain. He reaches the following averages, 239 brains having been measured. The weight of the entire average male brain is 1370.9 grm.; of which the hemispheres weigh 1194.1 ; the cerebellum 150.8 ; the medulla and pons, 26. The average female brain weighs 1229 ; hemispheres, 1009.9 ; cerebellum, 135.1 ; pons and medulla, 24. He finds that during the first twelve years of life the brain weight increases threefold. It reaches its maximum between the sixteenth and twentieth years. The length of the brain is 172.3 mm. in males ; 167.5 mm. in females. The breadth is 141.5 mm. in males ; 135.7 mm. in females. The height is 81.9 mm. in males ; 78.2 mm. in females. The distance between the apex of the frontal lobe and the upper end of the fissure of Rolando is 152.9 mm. in males and 140.6 in females. The distance between the apex of the occipital lobe and the upper end of the parieto-occipital fissure is 48.7 mm. in males, and 51.4 in females.

These figures are of interest when they are compared with those collected by Schwalbe from a large number of German authorities, since they indicate that the average Russian male brain weighs 4.1 grm. less than the average German male brain, and the average Russian female brain weighs 16 grm. less than the German. The Russian brain is also lighter than the English brain but is heavier than the French or Italian brain. The statement of Schwalbe that Germanic and Sclavonic races surpass the Latin race in brain weight is therefore confirmed by Buchstab.

The measurement of distances between the apices and fissures in the two sexes has not been made before. The statements here reproduced should be submitted to further investigation. The relatively large size of the occipital lobes in the female is important, and must be taken into account in any attempt to map out on the skull the position of the fissures.

THE CEREBELLAR PEDUNCLES AND THE COURSE OF THE FUNICULI GRACILES AND CUNEATI.—Vejas of Corfu has investigated, in the laboratory of Prof. Forel, in Zurich, the anatomy of the cerebellar peduncles, following the method of Gudden.

1. He extirpated the right funiculi graciles and cuneati in a rabbit, and examined the result seventy-four days after the operation. He found an atrophy of the posterior columns of the cord on the side of the operation downward to the upper dorsal region. Above the lesion the fibræ arcuatæ of the right funiculi were greatly reduced in size, as was also the inner division of the right inferior cerebellar peduncle with the cells which it contains. The only atrophy upon the left side was found in the interolivary tract, and this could only be followed as high as the corpus trapezoides. The olives, and Deiter's nucleus, and the corpus restiforme were not affected. He concludes that the inner division of the inferior peduncle of the cerebellum derives its fibres chiefly from the funiculus cuneatus of the same side through the formatio reticularis. These fibres do not pass through the corpus restiforme as Monakow supposed. They end in the ganglion tecti and not in the cerebellar hemispheres. The interolivary tract derives its fibres chiefly from the funiculi graciles of the opposite side.

2. He extirpated the right hemisphere of the cerebellum, including the dentate nucleus and the flocculus, and a portion of the right half of the vermiform lobe, in a rat. Fifty-two days after the operation the following changes were found. The right corpus restiforme, the right nucleus of Clarke (nucleus of the lateral column), and the left olive were greatly atrophied. The right superior peduncle of the cerebellum and the left red nucleus were atrophied. The right middle peduncle of the cerebellum (right superficial half of pons) was totally atrophied, and its gray mass reduced in size, but no change was found in the cerebral peduncles. Thalami normal.

3. He extirpated a portion only of the right cerebellum in a rabbit, viz., the flocculus, and the right middle peduncle with the accompanying portions of the nucleus dentatus. The vermiform lobe and ganglion tecti were not injured. Seventy-two days after the operation the brain was examined. The corpus restiforme and olive were not affected. The inner division of the inferior peduncle was preserved. The atrophy was confined to the superior and middle peduncles of the cerebellum on the right side, and to the red nucleus on the left side, but was less extensive than in the first case.

From these results the following conclusions are drawn : the corpus restiforme is made up (*a*) of the direct cerebellar column from the cord, (*b*) of the tract from the olive of the opposite side, (*c*) of a mass of fibres which come from the nucleus of the lateral column which lies in the formatio reticularis. It does not contain any fibres from the posterior columns of the cord or their funiculi. Its ending is not known, but it does not decussate with

the opposite corpus restiforme in the cerebellum. The inner division of the inferior peduncle is independent of the corpus restiforme, and is made up chiefly of fibres from the nucleus cuneatus of the same side. It also receives some fibres from the formatio reticularis. It ends in the ganglion tecti and possibly decussates within the cerebellum. The superior cerebellar peduncle arises from all parts of the cerebellar cortex but not from the vermiform lobe. It ends in the red nucleus of the opposite side. The middle peduncle of the cerebellum does not contain any commissural fibres between the cerebellar hemispheres. It arises from all parts of the cerebellum. It passes to the gray masses in the ventrad half of the pons, each hemisphere being joined with both halves of the pons. A part only of the fibres, therefore, cross the median line. The fibres end in the gray masses of the pons. There is no direct connection between the cerebellum and cerebrum. All the fibres from one end in nuclei, whence new fibres leave to pass to the other. These way stations are the gray masses of the pons and the red nucleus of the tegmentum.

The results of the author are compared with those of other observers in the original article, which is to be found in the *Arch. für Psychiatrie*, xvi., p. 200.

The Destination of the Posterior Columns of the Cord. —Edinger has investigated the course of the fibres from the posterior columns of the spinal cord upward into the medulla oblongata in fœtuses at the eighth month. At that time these fibres are medullated, while the fibres from the olivary bodies are still without sheaths; hence the two sets can be distinguished from each other. He finds that the fibres from the columns of Burdach and Goll take two courses. The greater number pass ventrad of the central canal and cross to the opposite side to form the interolivary tract. This decussation, known as the sensory, to distinguish it from the pyramidal or motor, continues higher than is usually described, the last fibres to cross passing from the termination of the posterior columns as high as the middle of the vagus nucleus. These upper fibres form a portion of the fibræ arcuatæ internæ which go through the formatio reticularis. They pass through the olivary body of the side from which they come, but do not enter into any relation with it. The olivary body is not connected with the posterior columns. The smaller number of fibres turn directly outward from the termination of the posterior columns and enter the restiforme body, and thus go to the cerebellum. They come exclusively from the column of Goll. They pass to the vermiform lobe of the cerebellum, being joined on their way by fibres which arise in the acoustic and trigeminal nuclei, and by the direct cerebellar column of the cord. The fibres which come from the opposite olivary body into the corpus restiforme pass to the hemispheres of the cerebellum and not to the vermiform lobe.—*Neurolog. centralbl.*, Feb. 15, 1885.

It is evident that Edinger makes no distinction between the corpus restiforme and the inferior peduncle of the cerebellum. Vejas, in the article just cited, considers the two as distinct. The corpus restiforme forms the lateral part of the tract passing from the medulla to the cerebellum; the inferior peduncle its mesal part. This nomenclature is unfortunate, as the entire tract should be included in the term inferior peduncle, and then two divisions of the peduncle may be described.

THE PYRAMIDAL TRACT AND THE LEMNISCUS.—Monakow reported at the January meeting of the Neurological Society of Berlin (*Neurologisches Centralbl.*, Feb, 1, 1885) some interesting observations upon the pyramidal tract and lemniscus. He had extirpated the right parietal lobe with the pyramidal termination in the cortex, in a cat. Six months after he found a total atrophy of the entire right pyramidal tract downward to the motor decussation, through which it could be followed to and along the pyramidal column of the spinal cord. In the anterior horn of the cord no change was found, although it is in the cells of this horn that the pyramidal fibres have been supposed to end. Monakow noticed, however, a decided atrophy of the cells in the processus reticularis throughout the cervical region. He therefore concludes that these cells are the terminal stations of the pyramidal fibres, and that from them arise new fibres which pass into the anterior horn.

In the same animal he found a descending degeneration of the lemniscus from the parietal cortex downward through the division of the internal capsule, which lay near the middle of the thalamus, through the tegmentum and pons into the interolivary tract, and thence through the sensory decussation to the funiculus gracilis of the opposite side. This corresponds in part to the descending degeneration which was traced in Spitzka's case of pons lesion, although, as Monakow shows, the degeneration was somewhat less extensive in the cat.

When this result is compared with that of Vejas just recorded, and with the observations of Flechsig as detailed in his Plan des menschlichen Gehirns, it becomes evident that in the lemniscus there are fibres which degenerate both upward and downward. It follows, therefore, either that the lemniscus has a double function and conveys both centripetal and centrifugal impulses, or that the conclusion that tracts degenerate only in the direction in which they convey impulses is untrue.

A NEW LATERAL FASCICULUS IN THE SPINAL CORD.—At the meeting of the Psychiatrical Society of St. Petersburg, Dec. 10, 1884, (reported in the *Centralbl. f. Nervenheilkunde*, Feb. 15, 1885), Bechterew demonstrated a bundle of fibres lying in the anterior part of the lateral column of the spinal cord, between the anterior border of the direct cerebellar column and the exit of the motor

nerve-roots near the periphery. It is triangular in shape, its base lying next to the pyramidal column, its apex forward. It extends from the lower part of the lumbar enlargement up through the entire length of the cord, gradually increasing in size, and ends in the nucleus of the lateral column in the formatio reticularis of the medulla.

It degenerates upward after transverse lesions of the cord, and is distinguished from the direct cerebellar column in such lesion by its thickness.

Bechterew is of the opinion that it transmits sensations of pain, his view being based on the experiments of Woroschiloff.

It is to be remembered that both Gowers and Haddon have described an area of ascending degeneration in the exact position described by Bechterew as the situation of this fasciculus, and that they have already advanced the opinion that this fasciculus has a sensory function. Bechterew states that this fasciculus receives a medullary sheath in the fœtus in the eighth month—that is, after the remainder of the lateral column and before the pyramidal tract, a fact not noticed by Flechsig.

The existence of secondary ascending degenerations in this area in the cases of Bechterew, Gowers, and Haddon is not to be doubted. Is it not possible, in view of the fact that in a very large number of cases of well-marked ascending degeneration it was not found, that in these three cases an abnormal position or size of the direct cerebellar columns has led the authors to a rather hasty conclusion? Flechsig has shown that abnormal distribution of fibres in the columns of the cord is by no means rare. In one case in sixty the pyramids do not decussate. It seems therefore a more natural interpretation of the facts, that three abnormal cords have been examined by these authors, than that all previous investigators should have overlooked an important fact.

On Sensorial Localizations in the Cortex Cerebri.—Luciana publishes in *Brain* (part xxiv.) the result of his careful experiments upon sensory localization. They are as follows:

1. Disturbances of vision follow extirpation of the cortex of the parietal, temporal, and frontal lobes, as well as of the occipital lobes, but permanent loss of sight only occurs when the occipital and adjacent parts of the parietal lobes are destroyed. Small lesions in other parts than the visual area may not produce even temporary disturbance of vision. The visual area is, therefore, limited to the parieto-occipital region. In dogs and monkeys the optic decussation is partial, hence lesion of one occipital lobe produces in these animals bilateral homonymous hemianopsia. A connection between a definite part of the retina and a definite part of the visual area could not be proven. The visual area thus described is somewhat more extensive than that of Munk. Total extirpation of both occipital lobes produces absolute blindness at first, but

later this is replaced by psychical blindness (Seelenblindheit). The dog avoids obstacles in walking, but does not recognize any previously familiar object. It therefore follows that the cortical area is not the seat of sensation, but in it the sensations are perceived, compared, mentally arranged, and remembered. The function of the cortex is to elaborate psychically the visual sensations which take place in the mesencephalic ganglia.

2. The auditory area is located in the temporal lobe, each ear being connected with both hemispheres. Disturbances of hearing may be caused by lesions in the adjacent parts of the parietal and frontal lobes, and in the cornu ammonis, but these are not permanent. Psychical deafness follows extirpation of both temporal lobes, but absolute deafness is not permanent.

3. The seat of the olfactory area is in the gyrus hippocampi and cornu ammonis, but also extends into the temporal lobe.

4. The location of gustatory sensations is not determined, but is probably near that of the olfactory.

5. The sensations of touch are perceived in the central convolutions, and therefore lesions of these cause anæsthesia as well as paralysis. The tactile area includes the parietal convolutions also, but does not reach the occipital or temporal lobes.

All the sensations appear to have a common zone in the parietal region, and lesions in this common zone may cause disturbance of all the senses.

It will be seen from this review that Luciani confirms the experiments of Munk, as opposed to Goltz. It is also to be noted that all experimenters except Ferrier now agree that the motor and tactile areas coincide to a great extent. The position held by Ferrier that tactile sensations are perceived in the cornu ammonis, has not been confirmed either by experiment or by pathological observation, and may be abandoned. It is probable that in experimenting on the cornu ammonis Ferrier wounded the tegmentum of the crus, which lies so near to it, and in which pass the sensory tracts, and that for this reason his conclusions were fallacious. M. ALLEN STARR, M.D., Ph.D.

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b.—PHYSIOLOGY OF THE NERVOUS SYSTEM.

THE INFLUENCE OF THE NERVOUS SYSTEM UPON RIGOR MORTIS.—Dr. A. von Gendre has made a series of experiments upon this subject in the Physiological Institute at Munich. Dr. A. von Eiselsberg, for several years, had made experiments upon this subject in the Institute. In animals killed by bleeding, a blow, or through woorari, he cut the sciatic in one leg immediately after death, and noted when the rigor mortis took place in each posterior extremity. In 72.4 per cent. of the cases, the rigor mortis ensued earlier in the leg whose sciatic was intact—that is, the nervous system accelerated the rigidity of death. Dr. von Gendre used frogs. An incubator was kept constantly at a tempera-

ture of 30° to 35° C. In this a glass cylinder was placed, in which the dead frog was hung. To prevent dryness, a wet sponge was placed at the bottom of the glass cylinder. In the first series of experiments, the frogs were killed by a subcutaneous injection of cyanide of potassium, and then the sciatic of one leg was divided. In 72.2 per cent. of the cases, the nervous system was found to accelerate the appearance of the rigor mortis. In a second series of experiments, the animals were killed by cyanide of potassium, and one of the sciatics divided. To eliminate the influence of the nervous system, the brain and spinal cord were destroyed. In nearly all, the appearance of rigidity was the same in both extremities. After eliminating the frogs killed by destroying the spinal cord, or by strychnia, or by woorari; there was no difference in the appearance of the rigor mortis. He also made experiments upon white rats, killed by bleeding. In all these animals, the rigidity of death came on earlier in the limb with the sciatic intact.—*Pflüger's Archiv*, Band xxxv., Heft 1 and 2.

THE BRAIN.—Herr Christiani has made a series of experiments upon this subject, on rabbits and dogs.

Of the higher respiratory centres, he found three in the basal ganglia. First, an inspiratory one, chiefly reflex, at the bottom of the third ventricle; second, an inspiration-centre, at the section between the anterior and posterior corpora quadrigemina; third, an expiratory- and inhibitory-centre at the entrance of the aqueduct of Sylvius. He also discovered, anterior to the inspiratory-centre in the third ventricle, a co-ordination-centre for the equilibrium. If the cerebral hemispheres are removed, so that bleeding does not ensue, and the animal, after the operation, is released, the temperature is still at the normal height; but if the centres in the optic thalami are extirpated, the temperature in animals who live falls from 3° to 5° C. in the first quarter of an hour. In a three-year-old dog, he removed the brain to the optic thalami; the animal lived a few hours. He observed here the inspiration- and expiration-centre in the third ventricle and the anterior corpora quadrigemina, as in rabbits. The reflex activity of the pupil and eyelids was retained, as was that of hearing. Rabbits, with the cerebrum removed, can evade obstacles, although not always elegantly, for the circulatory conditions of the retina are changed.—*DuBois' Arch.*, 1884, 4 and 5 Heft.

THE BRAIN.—Prof. Munk read a reply to the preceding paper of Herr Christiani. It is well known that Prof. M. found extirpation of certain parts of the hemispheres was followed by blindness. Not long after this discovery, Herr C. found that rabbits whose cerebrum was removed both saw and heard. Munk has repeated the experiments of Christiani on rabbits, and arrived at the conclusion that animals, from whom the cerebrum was removed, did not avoid obstacles, but were completely blind, and made no spon-

taneous movement. He makes numerous criticisms of the methods employed by Christiani.—*DuBois' Arch.*, 1884, 4 and 5 Heft.

THE PARALYTIC ACTION OF STRYCHNIA.—Herr Paul Bongers has made a series of experiments concerning the relation of strychnia to the motor nerves. He found, as many other observers did, that it paralyzed the motor nerves by a direct action on them and by the exhaustion consequent to the convulsive movements.—*DuBois' Arch.*, 1884, 4 and 5 Heft.

THE RESPIRATION ON A HIBERNATING HEDGEHOG.—Herr Paul Bongers has made a series of experiments upon this subject. He compared the breathing of chloralized hedgehogs with that of hibernating ones. He found that the state of narcosis differed from that of hibernation, as in the former it was not periodical but rhythmic, whilst in the latter it was periodical.—*DuBois' Arch.*, 1884, 4 and 5 Heft.

THE ACTION OF ERGOTIN, ERGOTININ, AND SCLEROTINIC ACID UPON THE BLOOD-PRESSURE, UTERINE MOVEMENTS, AND BLEEDING.—Herr Max Marckwald has made a series of experiments with these drugs. He used rabbits. It was discovered that the uterine contractions were independent of changes in the blood-pressure. His results were as follows :

1. Ergotinin is not to be used either as a hæmostatic or an oxytocic.

2. Dialyzed ergotin and sclerotinic acid are able to cause contraction of the uterus and arrest of hemorrhage from this organ.

3. Sclerotinic acid caused a depression of the arterial tension, and at the same time a general hæmostatic action. He confirms the view of Nikitin, that sclerotinic acid is chiefly the active principle of ergot. Sclerotinic acid is used in smaller doses than ergotin, but the former or its salts cannot be used hypodermically; here dialized ergotin must be employed. Generally the dose for man is too small.

For uterine fibroids the single dose should be at least 5 grammes of pure ergotin, whilst as a hæmostatic 1 to 2 grammes should be given at a dose. *DuBois' Arch.*, 1884, 4 and 5 Heft.

THE INNERVATION OF THE PYLORUS.—Dr. Oser has made a number of experiments upon dogs. His results are as follows :

1. By divided vagi and splanchnics, as well as by the uninjured nerves, the pylorus shows contraction of different intensity and irregularity. 2. Irritation of the vagi in the neck constantly calls out a contraction of the pylorus ; the more intense the irritation, the greater the contraction. 3. Irritation of the splanchnics in the thorax depresses the spontaneous contractions of the pylorus. The action of the splanchnics is gradually generated, and reaches its

maximum between the first and second minute after the beginning of the irritation. 4. During simultaneous irritation of the vagi in the neck and the splanchnics in the thorax, the inhibition of the latter causes only a diminution of the contraction of the pylorus. Maximal irritations of the splanchnics cannot completely paralyze weak irritations of the vagus. During the maximum of irritation of the splanchnic, the period of absolute quiet, irritation of the vagus is either without effect or causes only a scarcely noticeable elevation. 5. Irritation of the left splanchnic has a stronger action than that of the right.—*Centralblatt für die medicinischen Wissenschaften*, 1884, No. 26.

Thyroid Gland.—Schiff has made a series of experiments upon the lower animals. In the majority of the animals operated upon, he found that after a week or two a peculiar soporific state ensued, ending in death. On post-mortem no cause was discoverable. His results were as follows :

1. The mere laying bare of the thyroid gland, the section of the recurrent nerve in the neighborhood, the removal of nerve-branches passing to the gland from the recurrent nerve, did none of them occasion the peculiar symptoms following the removal of the gland itself.

2. It was also found that the nerve-branches, which in the dog accompany the chief arteries of the gland, and which are branches of the superior laryngeal nerve, might be cut without producing the peculiar symptoms. He noted, after the removal of the thyroid, well-marked fibrillary muscular contraction under the skin. At later periods convulsive movements of the limbs. There was increased irritability of the phrenic. A feeling of tickling over the skin in many animals. The general sensibility of the skin of the limbs became gradually lost from the periphery toward the centre. Very low blood-pressure was met with toward the end. Schiff believes that the gland has an intimate connection with the nutrition of the central nervous system.—*Edinburgh Clinical Journal*, July 19, 1884.

The Path of the Fibres Narrowing the Pupil.—Dr. Bechterew has made several observations upon this subject. His results are as follows :

1. Reflex-fibres narrowing the pupil are not contained either in the optic tract, or in their central ends in the corpora geniculata and corpora quadrigemina of the higher animals, or in the corpora bigemina of birds.

2. Those fibres have their beginning in the retina of the eye, and run in the optic nerves and behind the chiasm, enter the central gray matter in the cavity of the third ventricle, and join the nuclei of the oculomotor nerves, from which they return to the periphery in the trunk of the oculomotors.

3. During their whole course in the central gray matter the pupil-contracting fibres remain without decussation.

4. Each eye possesses its independent reflex-arc, which runs through the optic nerve, the corresponding half of the central gray substance, the nucleus and trunk of the oculomotorius on the same side.

5. Between the reflex-arcs of the two sides there is a connection, which transfers reflexes from one eye to the pupil of the other. This connection is probably through commissural fibres between the nuclei of the oculomotors.

6. The centres of the pupil-narrowing reflexes do not lie, as Hensen and Völkers think, at the bottom of the third ventricle, nor, as Adamük says, behind the corpora quadrigemina, but in all probability are localized in the nuclei of the oculomotors.

7. At the bottom of the third ventricle are no centres for the movement of the ocular muscles in the sense held by Hensen and Völkers.

8. The changes in the position of the eyes, together with the general motor disturbances by irritation or destruction in the neighborhood of the third ventricle, are in their character like those seen in the eye after destruction of the semicircular canals or the olivary bodies of the medulla, and show that the above-named region, as well as the semicircular canals and olivary bodies, have an influence over the whole motor sphere of the animal.

9. The centres for the voluntary movement of the ocular globe must be located in the nuclei of the nerves innervating the ocular muscles.

10. The localization of an accommodation-centre in the region of the bottom of the third ventricle cannot be held as substantiated from the foregoing observations.

11. The dilating action of painful irritation upon the pupil is conveyed not through the sympathetic fibres, but can result independently through inhibition of the light-reflex.

12. The so-called motionless pupil is probably due to pathological processes which break the path of the light-reflexes in their course from the chiasm of the optic nerves to the nuclei of the oculomotors.—*Pflüger's Arch.*, 1883, Band xxxi., Heft 1 and 2.

Respiratory Innervation.—Prof. Knoll has made experiments upon this subject, using rabbits. The vagus is irritated by its own current. If the vagi are previously divided, and they are lifted from the wound in the neck, a marked change occurs in the respiratory movements producing an expiration. A similar expiratory arrest can be produced by allowing the elevated vagi to settle down in the wound. If a mica plate is put under the vagus and a 0.6-per-cent. salt solution is applied to the nerve, the expiration also takes place; also, if the nerve is lifted out of the salt solution. The application of the metal electrodes to the nerve, although no current is passing, also causes it. These effects are produced by variations in the current of the vagus itself. When

similar procedures are enacted with the peripheral stump of the vagus, then no result ensues as regards the heart.—*Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften*, 1882, Band lxxxv.

Respiration when the Vagi are Artificially Irritated.—Dr. Knoll has made several experiments upon this subject, using rabbits, mostly slightly narcotized. With induction currents on the central end of the vagus, there was, in accordance with Wedenskii, an expiration, whilst by increase of the strength of the current the well-known inspiration ensued. Although by long irritation of the vagus there must ensue by the arrest of the respiration a certain degree of dyspnœa, yet during the irritation no contraction of previously inactive respiratory muscles was observed.

The muscles assisting respiration, which previously were in activity, are relaxed by vagus irritation. The anæmia of the brain existing during the inspiratory arrest caused by the vagus-irritation calls out no respiratory movement.

During the inspiratory stand-still the respiration-reflexes from other nerves are either weakened or not retained at all. A part of the apparent irregularities in the action of the induction-current upon the vagus end depends upon the relation which the direction of the opening breaks stands to the distance of the irritation from the place of nerve-section. In the neighborhood of the section, weak ascending opening breaks are more active than similar strong descending ones. But two to three centimetres from the section we find, on the other hand, that weak irritations by the descending opening current in general are more active than the ascending ones. Hence in many cases there are obtained, by one and the same current strength, from the same part of the nerve, by changes of the direction of the current, sometimes expiratory and sometimes inspiratory results, or by gradually moving the electrodes from the place of section toward the cerebral end of the nerve. Sometimes the expiratory results are turned into inspiratory ones. By the use of different mechanical manipulations irritating the central end of the nerve, the conclusion was reached that the inspiratory action is the regular primary result of the action of mechanical irritations. Chemical irritants, which serve as side-conductors for the current of the nerve itself, call out complicated results. Temperature changes in the limits from + 2° to 60° C. have no action upon the central end of the vagus. Freezing the central end of the vagus caused no irritation.—*Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften*, 1882.

Apnœa.—Several experiments upon this state have been worked out by Dr. Philip Knoll. His results are as follows:

1. Artificial respiration in rabbits with intact vagi depresses the excitability of the respiratory apparatus.

2. The depression of the excitability of the respiratory apparatus by artificial respiration can be so intense that anæmia of the brain and spasms ensue, but no respiratory movement.

3. The artificial respiration depresses the excitability of the respiratory centres through a rhythmic irritation of the vagi by the rhythmic dilatation of the lungs.—*Sitzungsberichte der Kaiserlichen Akademie der Wissenchaften*, 1882.

MASSAGE.—Dr. Zabludoroski has made very careful experiments as to the effect of massage upon three persons. The three persons were living under similar conditions as to residence, activity, and nourishment, and two weeks before beginning the experiments, the nitrogen balance was constant. For eight days, under similar conditions, the weight was taken, the muscular strength of the hand, the bodily temperature in rectum and axilla, the pulse-frequence, the frequency of the respiration, the specific gravity of the urine, the acidity of the urine, the amount of nitrogen excreted by the kidneys ; also the amount of phosphoric acid, the amount of sulphuric acid, and the number of daily fœcal evacuations. The series of experiments were so arranged that the first eight days all estimates were made without massage ; then a series, ten days long, with daily general massage ; and finally, eight days long, without massage. In all three persons experimented upon, the muscular strength was increased. The body-weight of the corpulent person decreased, as also did that of a slender female, and corresponding to these conditions the quantity of nitrogen and sulphuric acid increased. By a moderately well-nourished person the body-weight increased, and here less nitrogen was excreted, but more sulphuric acid was given off. The after-effect of the massage disappeared the most quickly in the servant, whilst in the female it lasted during the whole period of observation.

As a result of massage of the abdominal muscles, the peristaltic movements were stronger, and the fœcal evacuations regular. Repeated observations showed more than measurements did an increase of the vital functions ; the body moved more easily, the appetite increased, and the sleep was quiet and sound. Massage of the upper part of the thigh caused erection. A man who raised a weight of one kilogramme, at intervals of a second, eight hundred and forty times, and by further strong exertion failed to raise it, was so much restored by massage of the same arm for five minutes, that he raised the same weight under similar conditions more than eleven hundred times. He also experimented upon animals. Massage of muscles caused a very complete perfusion, which brought in not only new nourishment, but completely removed the carbonized materials.

Massage reduces the excitability of the muscle as regards electric irritants. The sensory nerves in the skin lose considerable irritability through massage. Massage has a reflex action on

the heart; the natural tonus of the vagus is reduced. In a dog, through massage, the pulse ran from twenty-six to sixty-four in a minute, and after massage fell back to thirty-six per minute. If the vagi were divided, the pulse was not accelerated by massage. The blood-pressure was elevated. *Centralblatt f. d. med. Wiss.*, 1883, No. 14. ISAAC OTT, M.D.

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c.—GENERAL PATHOLOGY OF THE NERVOUS SYSTEM.

TONER LECTURE ON MENTAL OVERWORK AND PREMATURE DISEASE AMONG PUBLIC AND PROFESSIONAL MEN. By Charles K. Mills, M.D.—The "Toner Lectures" have been instituted at Washington, D. C., by Joseph M. Toner, M.D., who has placed in charge of a board of trustees a fund, the interest of which is to be applied for at least two annual memoirs or essays relative to some branch of medical science, and containing some new truth fully established by experiment or observation. As these lectures are intended to increase and diffuse knowledge, they have been accepted for publication by the Smithsonian Institution in its "Miscellaneous Collections." Since the establishment of this fund, nine lectures in all have been delivered. The first lecture of the series was delivered March 28, 1873, by the late Dr. J. J. Woodward. Other lectures have been delivered successively, at irregular intervals, by D. C. E. Brown-Séquard of France, Dr. J. M. DaCosta, Dr. H. C. Wood, Dr. W. W. Keen, Dr. William Adams of London, Dr. Edward O. Shakespeare, and Mr. George E. Waring, Jr. The ninth lecture was delivered, March 19, 1884, by Dr. Charles K. Mills. His subject, suggested by Dr. Toner, was "Mental Overwork and Premature Disease among Public and Professional Men." This lecture, in the form of a pamphlet of thirty-four pages, has just been published by the Smithsonian Institution.

The longevity of intellectual workers in general is first considered, and is found to be above that of most other classes. The inferences and conclusions of the paper are largely based upon a study of sixty cases, especially collected by the author, cases in which loss of health or life had been mainly attributable to excessive brain work and brain strain.

These cases are arranged into two classes: (1) Men in political and official life, including cabinet officers, senators, representatives, department officials, governors, and candidates for office; (2) Professional men, including physicians, lawyers, clergymen, journalists, scientists, and teachers.

The actual occupations were: cabinet officer, 1; senators, 8; representatives in Congress, 10; department officials, 5; governors, 2; candidates for important offices, 2; physicians, 6; lawyers, 7; clergymen, 2; journalists, 4; scientists, 6; teachers, 7.

Twenty-eight of the sixty, therefore, were men in political and official life, and eighteen of these were members of Congress.

The average longevity of men in the higher walks of political life in this country is regarded as considerably below the average of those who occupy similar positions in England. Comparing, so far as information was available, the ages at death of United States Congressmen and members of the English Parliament, who have died since 1860, the following results were obtained : Fifty-nine United States senators gave an average of sixty-one years ; one hundred and forty-six United States representatives an average of fifty-five years ; the average for both being, therefore, fifty-eight years. One hundred and twenty-one members of Parliament gave the remarkable average age at death of sixty-eight years.

Taking twenty-five of those that might be regarded as the most eminent American statesmen of the last one hundred years, and comparing their ages at death with those of the same number of the most distinguished English statesmen, the United States gave an average of sixty-nine years, and Great Britain of seventy—no practical difference. It was noticeable, however, that much of the best work of the great English statesmen—of Palmerston, Derby, and Beaconsfield, for instance—had been done at an advanced age, when most American public men have ceased to do any thing important.

The lecturer considers some of the causes which lead to mental overwork and break-down in American public and professional life, the early warnings of such overwork, and the forms of disease most likely to result.

The preparation, qualifications, and modes of life of American public men are discussed, and in some instances comparisons are made with English statesmen. The histories of many of the cases are briefly sketched. The special conditions which lead to overwork and its consequences among physicians, lawyers, journalists, scientists, and teachers are presented at some length, with illustrative cases. The evil effects of competitive examinations and cramming, upon both teachers and scholars, in our public schools are also described.

The symptom-groups and diseases represented by the series of sixty cases are summarized as follows : Acute neurasthenia, 18 ; insanity, 10 ; phthisis, 9 ; diabetes, 4 ; cerebral hemorrhage, 4 ; Bright's disease, 3 ; posterior spinal sclerosis, 3 ; pneumonia, 3 ; bulbar paralysis, 1 ; angina pectoris, 1 ; erysipelas, 1 ; hepatitis, 1 ; enteritis, 1 ; glossitis, 1.

It was found almost impossible to present in orderly array all the symptoms which may be regarded as the indications of nervous exhaustion, and the probable precursors of premature disease from brain strain and overwork, these symptoms varying somewhat with the individual—with his hereditary tendencies, his habits and his surroundings. There were, however, certain common and positive evidences of existing or coming evil which were present in many cases.

Neurasthenia and lithæmia are discussed.

The most important conclusions are summarized as follows :

1. Intellectual work does not of itself injure health or shorten life, but mental overwork, particularly when associated with emotional strain, is a frequent cause of nervous break-down and premature disease.

2. The average longevity of men in the higher walks of public life is less in this country than in England. Politics here is not, as there, in the best sense a vocation ; and our public men, in many cases, succumb in health, or fail to attain long life, because they go into careers unprepared, by inheritance, education, and training, for the severe demands to be made upon their powers.

3. Health and life are sometimes lost through forgetfulness of the fact that mental strain and overwork are particularly dangerous to those in middle life or advanced in years who attempt brain work and responsibilities to which they have not been accustomed. The effects of suddenly imposed mental strain upon these classes are especially disastrous.

4. If not subjected to unusual mental or physical strain, public and professional men, as well as those in other walks of life, although afflicted with organic diseases, may live in comparative comfort, and able to do a moderate amount of work for many years.

5. Among special causes of premature disease in public life are onerous and perplexing duties on Congressional committees, the uncertainties and disappointments attendant upon public positions, the great strain to which candidates are subjected during political campaigns, lack of recreation, and social excesses and abuses at the national capital.

6. Among physicians, lawyers, and journalists the performance of brain work under pressure for time, and under bad hygienic conditions, is a common cause of ill-health. Defective education and pecuniary harassments are also special causes of nervous break-down and premature disease among physicians and lawyers.

7. Comparatively few clergymen succumb completely to mental overwork, although many suffer from a mild but annoying form of neurasthenia.

8. The danger to the scientific worker usually arises from too intense and too prolonged activity of the mind in one direction.

9. The system of severe competitive examinations in vogue in many communities saps the health of both teachers and pupils. In our schools generally educational methods are bad, recreation is too much neglected, and unhealthy emulation too much encouraged. Education is not properly individualized.

10. Chronic neurasthenia is not common among men prominent in public affairs and in the professions. Such men are, however, sometimes the victims of a severe acute nervous prostration, which may result in serious organic disease.

11. Nervous strain is one of the causes of lithæmia, which is of not infrequent occurrence among public and professional men, but lithæmia and neurasthenia are not interchangeable terms.

12. The warnings of mental overwork and overstrain vary with individuals and circumstances, but certain psychical symptoms, and such physical symptoms as immobility of countenance, diminished resisting power, heart-failure, sleeplessness, cervico-occipital pain or distress, and dyspepsia are of most frequent occurrence.

13. Insanity, particularly in the forms of melancholia and paretic dementia, is sometimes developed by brain strain and overwork. A family history of insanity is often present in such cases.

14. Phthisis, diabetes, and Bright's disease are among other diseases most likely to be developed by mental overwork. Men in whose families phthisis is hereditary should carefully guard against such overwork.

15. Overtaxing the mind and nervous system may be the exciting cause of almost any serious disorder to which chance, accident, imprudence, or infection exposes the individual.

16. Many diseases, not nervous in their seat or manifestation, are developed directly or indirectly as the result of mental and nervous strain, through exhaustion, impairment, or lesion of the centres of the organic functions.

A Case of Hemorrhage in the Corpus Callosum.—Erb (*Virchow's Arch.*, Bd. xcvii., Heft 2) reports the case of a male, æt. sixty-one, who was acutely attacked with headache, vertigo, vomiting, rigidity of the neck muscles, and incontinence of urine. He became stupid and somnolent, his respiration was slow and stertorous. Motility and sensibility were normal, except abolition of the patellar tendon reflex. Later, spasms of the extremities, pupillary immobility, and Cheyne-Stokes phenomena appeared, and the tendon reflex returned. Death followed on the eleventh day. There had been no disturbance of speech, deglutition, mastication, or mimetic movements. No paresis, ataxia, rigidity or disturbance of the special senses, and no psychical alterations except the somnolence. A diagnosis was made of subacute cerebro-spinal meningitis. The autopsy revealed a cerebro-spinal, hemorrhagic lepto-meningitis, also a hemorrhagic rent of the corpus callosum through its anterior three fourths, involving its entire thickness. Attention is called to the case as showing that almost the entire callosum may be destroyed without disturbance of motility, co-ordination, sensibility, the reflexes, special sensation, the speech, and without profound disturbance of the intellect.—Thomsen in *Centralbl. klin. Med.*

A Case of Acute Poliomyelitis in the Adult.—John Van Duyn, M.D., of Syracuse, N. Y., reports under the above heading, in *Arch. Med.*, Aug., '84, the case of a male, æt. twenty-three; clerk, of good muscular development, with no history of intem-

perance, venereal or other disease, except malarial fever in 1881, and typhoid fever in 1882. On Aug. 24, 1883, after walking nine miles, arriving home at 2 A.M., he slept six hours. At noon he exercised for two hours in a violent manner, in jumping and "putting" a stone weighing nearly forty pounds, the stone being "put" from the shoulder, by the right arm forward, and thrown by both arms over the head backward. After a hearty dinner he walked three miles, rode in a stage two miles, and by rail ten miles, and retired at 11 P.M. after an additional walk. Some soreness was felt for a day or two only. He was not overheated or chilled by his exertion. September 7th he awoke with severe pain between the shoulders, increased by rotation of the head. He continued work that day, but felt chilly and had a red face. In the afternoon his grasp became weak (right hand), being hardly sufficient to hold a pencil in writing, and by the third day power was entirely lost. That evening he rode ten miles by rail; insomnia, headache, chill, and nausea occurred that night. The next day he could raise his right hand to his face, but could not button his clothes with it. His legs failing, he rode home in a wagon three miles, getting in and out with difficulty. The following day felt weak and sore, the left arm becoming feeble (not below elbow). At night he could raise neither elbow from the bed, and was obliged to remain there. He suffered from general soreness, the whole body being painfully sensitive to the touch, respiration being also painful. During the next three or four days the paralysis became general, excepting the head, neck, thorax, and the left forearm and hand. He could not raise his heels from the bed, but could flex the thighs on the abdomen. He had decided constipation, but no bladder affection. Temperature on the fourth day 102°; a few days later 101°. Improvement began after the tenth day. At the end of the second week could not stand nor raise feet from the floor. At the end of the third week could walk with assistance, dragging feet. The left arm recovered rapidly. After the fourth week he could walk alone, the right leg being much the stronger. During the four weeks he lost sixty pounds in weight. Examination Jan. 12, '84. Complete loss of voluntary motion (with great atrophy) in all muscles supplied by the right brachial plexus excepting the fifth and sixth cervical roots. The right hand atrophied and deformed *en griffe;* unaffected by faradism; responding to strong galvanism, except those of the hand; atrophy of the left supra-spinatus and infra-spinatus, and to a less degree the pectoral muscles; all responding well to faradism. The elbow could be raised with great difficulty to the level of the shoulder. Power to raise either knee was diminished; reaction to faradism in the left anterior tibial, but no voluntary power. On May 16, '84, after almost daily electrical treatment, all muscles of the right upper extremity contract with galvanism according to the normal formula. The brachialis anticus, biceps, sup. longus, and the pectoral muscles contract under faradism, and all have voluntary power

except sup. longus. The left shoulder muscles and left anterior tibial are also under voluntary control. Dr. Van Duyn remarks that "this typical case of acute spinal paralysis is recorded because of the clear history of the progress, and retrogression of the paralytic state, and the manifest relationship between the disease and the violent muscular exertion which preceded it. Should the gymnastic violence be conceded as the cause, than which no other is apparent, then interest must attach itself to the length of time which intervened between the cause and the outbreak of the disease, and to the fact that while both extremities, upper and lower, were affected during the fever, the muscles which remained paralyzed and atrophied were those most violently exercised, and the severity of the results and their permanency are in direct ratio with the use of the muscles."

TUMOR OF THE CEREBELLUM.—Dr. S. A. K. Strahan reported the following case before the British Medical Association in a paper on tumors of the cerebellum: Charles L., aged seven, was admitted as an idiot into the County Asylum, Northhampton. He was a small squat boy, with convergent strabismus and some nystagmus. He talked incoherently in a semi-distinct manner, answered simple questions sensibly with "yes" and "no," and made peculiar noises with his mouth at times. He was dirty and destructive in his habits at first, but improved much in this respect. He always had an awkward gait although nimble with his feet, and he generally kept the hands and wrists half flexed as though semi-paralyzed. Co-ordination in the hands appeared good, but in the legs it was from the first imperfect; vision was good and sensation normal. The family history is worthy of attention; it is as follows: His grandmother was an epileptic; his mother was an inmate of an asylum; his father had been a certified lunatic on at least one occasion, and an uncle had died in an asylum. The boy lived five years after his admission into the asylum. After one year's residence he began to have attacks of vomiting at irregular intervals, which were attributed to overeating, and a year later he developed what was looked upon as a true epilepsy. During the third year of residence, the fits, which had been few, began to increase in number, and he made no mental advance from this time. During the fifth and last year, he became unable to walk safely. His gait was exactly that of a child, giddy from turning round; when he got started in a straight line he would get along pretty well at a kind of half run, but when called back he would stop, sway about, and seem unable to turn from fear of falling. During the six months before death the giddiness increased and he was soon totally unable to walk alone, although he could do so fairly well if supported by the hands. Then he became worse and could not stand alone. If left standing he swung around and fell. The body did not in its gyratory movements always swing to the same side; the direc-

tion seemed to be determined by the relative position of the body and lower limbs at the time. A month before death he was found to be totally blind; but, in consequence of his limited mental development, it was not known when the optic neuritis had set in. Five years after admission (aged twelve) he was seized with a fit, in which he died from apnœa. During the last year, when able to walk about, he was noticed to turn round when seized with a fit, and before he fell he was seen to make more than a complete revolution.

Necropsy.—The arachnoid was thickened generally over hemispheres, and the pia mater, on removal, tore the brain tissue considerably. The convolutions were somewhat flattened; the gray matter was thin; the sulci were shallow, and the white centres of rather more than the usual consistence; in fact it was a typical imbecile brain. The brain could not be removed entire, in consequence of adhesion between the posterior part of the cerebellum and the dura mater. The adhesion was sufficiently firm to drag the tumor out of its bed in the surrounding softened brain tissue. The adhesion was made up entirely of connective tissue; there was no vascular connection. The tumor lay in the central line and extended almost equally into each lobe. The surrounding brain-tissue was much softened, and it was impossible to make out even the arbor vitæ on section. The tumor weighed over an ounce, and made up more than a third of the whole cerebellar mass. It occupied the whole depth of the inner and posterior parts of each lateral lobe of the cerebellum, and extended forward over the roof of the fourth ventricle to the peduncles.—*Brit. Med. Jour.*, No. 1236.

Muscular Paralysis in the Course of Locomotor Ataxia.—Dejerine (*Prog. méd.*, 43) reports a case of bilateral paralysis of the levator palpebrarum sup., in which at the autopsy degeneration of the corresponding nerve-branches was discovered, while the remaining branches of the third nerves were normal. He regards such a peripheral neuritis of motor nerves as analogous to this degeneration, which he has heretofore observed in peripheral sensory nerves of tabetic patients.

Alcoholic Pseudo-Tabes.—Dr. Krüche, of Marbach, calls attention to a group of symptoms resembling tabes, consisting of functional disturbances of the spinal cord and nerves, occurring not so often in habitual drinkers as in those who may be termed nervous drinkers, in whom the central nervous system represents the *locus minoris resistentiæ*. The initial symptoms resemble true tabes, the disturbances of co-ordination are also similar, the tendon reflex may be absent, and the sensibility to temperature and pressure diminished. Faradic excitability is increased, while muscular contractility is only moderately excitable. Frequently the optic papillæ are somewhat pale, and considerable variations in temper-

ature are observable between the maximum and minimum on the same day.

EULENBURGS CASE OF HYPERTONIA MUSCULORUM PSEUDO-HYPERTROPHICA.—In the October Periscope of THE JOURNAL (p. 694) appeared a translation of Bernhardt's abstract of this case. In the *Neurolog. Centralblatt*, Feb. 15, '85, Bernhardt reports additional facts and opinions, the patient having fallen into his hands. He says: "The muscular rigidity described by Eulenburg is no longer perceptible; it is possible, however, that this symptom disappeared under a continuous treatment of several months, but, on the other hand, instead of pseudo-hypertrophy of the muscles, distinct atrophy is found; furthermore, the knee phenomenon noted as absent on both sides at the time of Eulenburg's examination, can be distinctly, though not easily, produced." Bernhardt declines, therefore, to consider this case as one of Thomsen's disease. It is not, he says, a case of profound central (intra-medullary) neuropathy, but belongs, in his opinion, to that form of muscular affection known (according to Erb) as dystrophia musculorum progressiva. W. R. BIRDSALL, M.D.

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d.—MENTAL PATHOLOGY.

FORENSIC RELATIONS OF MORPHINOMANIA.—Dr. Morandan de Monteyel (*L'Encéphale*, No. 6, 1883) concludes, respecting morphinomania, as he designates the morphine form of opiophogism: 1. That morphinomania, considered in itself, is not a psychosis, and does not *per se* prejudge the mental status of a person accused of crime. 2. The more or less rapid effect of morphine on the intellect depends upon the person and not on the dose used; this last has but little medico-legal value. 3. It is desirable to ascertain whether an accused morphinomaniac, at the time of alleged commission of reprehensible acts, was under the influence of full doses of the drug, or was suffering from the effects of abstention from it. 4. In morphinomania it is indispensable to distinguish the first period, called euphoria, from the following period, called physico-psychic marasmus. 5. In morphinomania, during the period of indulgence, responsibility during euphoria is complete, except as to acts having for object the assuagement of the morphine craving, 6. During the period of physico-psychical marasmus, responsibility is null, but the acts committed under the influence of this state are only such as would be committed by a dement or an acute maniac. 7. In abstinence from the drug responsibility is null, but the acts committed under the influence of this state, and for which the patient is irresponsible, are such as would be the result of dementia or furor.

ALCOHOLISM IN CHILDHOOD.—Dr. T. More Madden (*British Medical Journal*, August 23, 1884) reports the case of an eight-

year-old boy, whose mother was an inebriate. The child was brought up away from home purposely to avoid the influence of the maternal example, but on his return home at the age of six he discovered a bottle of whiskey secreted by his mother, became stupidly drunk, and thenceforth tippled whenever he could. A few days prior to admission to the hospital, he abstracted a bottle of port wine, which he finished all but a glass. This drinking bout was succeeded by coma, followed by delirium tremens of a decided character. Two months after admission he was discharged recovered and placed in a reform school. In Dr. Madden's opinion this tendency to alcoholism is inherited.

Insanity and Intermittent Fever.—Dr. H. Charles-Antoine Ravel (*Annales médico-psychologiques*, July, 1884) concludes: First: That intermittent fever may accompany mental alienation. Second: Intermittent fever may be accompanied by psychical phenomena, which form a connecting link between impaludism and secondary confusional insanity. Third: Intermittent fever sometimes leaves lesions predisposing to insanity. Fourth: Intermittent fever may produce insanity in predisposed subjects. Fifth: Patients, victims to prolonged intermittents and victims of depressing emotion, are readily attacked by fever. Sixth: Alcoholic excess readily produces alcoholic insanity in malaria-affected subjects. Seventh: Abuse of venesection and quinine in intermittent fever predispose to insanity.

Ancestors of the Insane.—Drs. Ball and Régis (*L'Encephale*, No. 6, 1884) conclude that: First: The duration of life is greater among ancestors of lunatics than the duration of life among ordinary persons. Among the ancestors of alcoholics and paretic dements the mean age is greatest; it passes ordinary limits. In neuropathic and vesanic families longevity is less decided, and tends to approximate ordinary limits. Nonagenarians and centenarians are frequently found among the ancestors of alcoholic and paretic dementia cases. Second: The mean natality of the families of lunatics is greater than that of normal families. Third: Vitality is much less among the families of the insane than among the sane. Fourth: Morbidity, or the liability to disease, is much greater among the insane families than the normal, and much greater among the vesanic than among the paretic dementia and alcoholic families. Ball and Régis are of opinion that insane families constitute a class apart in the population of a country, and that the more the question is studied the more will it be shown that there is a profound and radical difference separating them from their fellow-citizens.

Puerperal Insanity.—Dr. Taylor (*Cincinnati Lancet and Clinic*, Nov. 8, 1884) reports two cases of puerperal insanity.

The first was a lady in good circumstances, with an indistinct history of hereditary insanity. She was a primipara, and the labor was natural, with no unusual or unfavorable circumstances attending or following it until three weeks had passed. She became incoherent, and continued so, with occasional paroxysms of violence for, three weeks, when we saw her in consultation. She took no notice of her child, and the secretion of milk failed. Her pulse was high, and the temperature could not well be ascertained on account of her resistance. She was sleepless, had some sanguineous discharge, and emaciated quite rapidly. Potassium bromide and chloral had been given, and sometimes morphia in large doses. He objected to the large doses of morphia. Nutritive fluids and tonics, with chloral as an hypnotic, was the treatment he would pursue, and he would prefer to give the chloral by enema, so as to avoid gastric derangement as far as possible. The most important factor in the treatment of such cases he believed to be separation from friends and the familiar surroundings of home, and therefore advised, in this case, seclusion in a private asylum. The second case was a colored girl in the hospital. Before delivery she was sullen, and avoided association with the other inmates of the ward; when annoyed, became excited and violent, and attacked those with whom she came in contact. It was necessary to restrain her until the birth of her child. After that she became quiet, but not rational. She slept well, but had some elevation of temperature. She remained quiet unless crossed, when she became much excited. Once she attempted to escape from the hospital in a way a sane person would hardly attempt. This last case is evidently not one of puerperal insanity. In these cases, Dr. Taylor advised early separation from friends and seclusion in an asylum. Dr. Stanton thought the chances of recovery better away from home, even if the patient were not in an asylum. In an asylum skilled nurses and proper appliances would still further increase the chances of cure in any case of insanity. Puerperal insanity is generally considered curable. He had seen but few recent cases in the State Asylum, most of those brought there being chronic. At that time chloral had not come into use, and the treatment consisted of stimulants and tonics, with good diet. Some potassium bromide was given, but the main reliance was upon opium as an hypnotic. Dr. John Davis agreed as to the propriety of removal of the patient from home, when the case was not complicated with metritis, perimetritis, or some disease endangering life. The chief benefit of asylum treatment consists in the separation from friends and familiar surroundings. He mentioned a case which occurred in the hospital some years ago. The case was one of complete insomnia, and was treated with dry cups to the spine, and afterward large doses of extract of hyoscyamus, as much as ʒ ij. in twenty-four hours. This resulted in producing sleep. The patient finally recovered. The recovery was doubtless the effect of time, aided, probably, by the hyoscyamus. In metritis and perimetritis the effect of opium is un-

doubtedly good. The greatest benefit is also derived from the free application of hot water in inflammation of the uterus and surrounding structures, whether the inflammation be acute or subacute. Frequently repeated and long-continued applications have proven beneficial where the smaller quantity ordinarily used has failed. Dr. Eichberg asked Dr. Taylor if there were not cases which could be treated without morphine. Dr. Taylor said, it was well to do without morphia as far as possible, for it interfered with secretion, and as death resulted from exhaustion, it was of the utmost importance to maintain the integrity of the digestive organs. Nourishment and sleep must be obtained—the latter by other means than morphia where possible. He believed large doses of this agent proved injurious. He had once been consulted in a case where an insurance company contested the payment of a policy on the ground of fraud in its procurement, the fraud consisting in the insured having concealed, or failed to state the fact that his sister had suffered from puerperal insanity. He was asked if puerperal insanity was hereditary, and expressed the opinion that it was a mark of hereditary weakness. In several of his cases of puerperal insanity the family history showed heredity. Dr. John Davis agreed as to the advisability of producing sleep without opium when possible, but would not discard it in all cases. He often met with success in the use of a combination of potassium bromide and chloral. Dr. Stanton said, the insane require larger doses of opium than the sane. When opium, given to produce sleep, should be given in large doses, small doses are a waste of the drug and a loss of valuable time. It will be obvious that under the term puerperal insanity are here included gestational, lactational, and puerperal insanity properly so-called, as well as cases in which insane women become pregnant.

Blood of the Insane.—Dr. S. Rutherford Macphail (*Journal of Mental Science*, October, 1884) concludes, after an examination of the blood of secondary confusional lunatics and terminal dements: 1. That the percentage of hæmoglobin is considerably below the normal standard and does not appear to be influenced by the age of the patient. 2. The percentage of hæmacytes is likewise diminished, and this diminution progresses with the age of the individual. 3. The proportion of white to red corpuscles is normal. 4. The blood is deficient in hæmatoblasts. 5. In patients over thirty the weight decreases, but this decrease does not appear to influence the relative percentage of hæmoglobin and hæmacytes.

Delusional Monomania.—Under this title Dr. M. H. Bochroch reports (*Polyclinic*, Sept. 15, 1884) the following case of alcoholic insanity: G. B., æt. forty-seven, white, married, a cabinet-maker, and Prussian by birth, came to the Polyclinic alone, and complained that

he had been poisoned by his wife. He said that he suspected his wife of putting poisons in his food. After taking milk, the day before coming to the service, while at work, he experienced a pulsation of vessels over the whole body. He said that he had been in this country for a year, and was perfectly well until the arrival of his wife, when he began to have weak spells, and also noticed a discoloration of the urine. He was the father of ten children, and thought their mother was trying to mislead them. He heard noises in the rooms which his daughters occupied at night; and was in a peculiar condition; for, though awake, he could not get up and find out the cause of the noises; there seemed to be some peculiar power over him which kept him down. His wife had a goitre which she painted with iodine, and he believed that she also mixed this with butter in preparing his meats. She got him so confused in Germany that he was unable to take care of his stock of goods, and in this way cheated him out of his fortune. His wife, who was from the chief European wine-raising district, was an expert in the mixing of wines, having learned the business from her father. He believed that his brother-in-law was affected like himself, through her doings. He had noises in his ears, like the escape of steam, but never had heard any voices. He was sure that his wife was not true to him, that she went with other men. He had tried, in Germany, to obtain a divorce on the strength of her attempts to poison him, but the judge, much to his disgust, ignored the case and advised him to come to this country. His wife followed him in about a year. When he was under the influence of her spells, he thought his sexual powers were injured. He was confident that she used some of her menstrual discharge to produce this effect. The wife of the patient was sent for, and said he had been out of his head for fifteen or eighteen years. He sometimes got violent spells and struck her. He suspected everybody coming to the house. He had bought a book on poisons, and had tried to study the diseases which they produced. Just now he thought that his peculiar symptoms were due to opium poisoning. He had no tremor, apparently no loss of memory. He had never been a hard drinker; he drank beer and wine at times, but not to excess. He was an intelligent man outside of his delusions. Nothing of a satisfactory character could be learned with regard to his family history. There are some indications pointing to paranoia in the case.

RACE AND INSANITY.—The following tables show the types of insanity among the races in the Cook County, Ill. (Chicago), Hospital for the Insane, as compiled in 1884 by Dr. S. V. Clevenger.

Psychosis.	Anglo-Saxon.				German.				Scandinavian.				Celt.				Latin.				Sclavonic.				Shemitic.				Negro.		
	Foreign.		Native.		Foreign.		Native.		Foreign.		Native.		Foreign.		Native.		Foreign.		Native.		Foreign.		Native.		Foreign.		Native.		Native.		
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	
Terminal Dementia	13	3	12	22	25	35	1	7	10	18			28	40	10	6	4	1			4	10			2	1		1	2	1	256
Epileptic Insanity	4	1	4	5	11	8	2		1	1			9	5	6	2					2	1								1	63
Primary Confusional Insanity		1		2	1					1			1	4		2					1									13
Secondary Confusional Insanity	3	1	6	5	8	5			3	5			5	5	7	2					5	2			1				1		64
Syphilitic Insanity					2		1						2																		5
Mania	3	2	2	3	5	14	1		1	7	1		6	24	4	1	1				3	2			2					2	84
Periodical Insanity			1		2	1				6			2	7	2	1						1				1				1	25
Choreic "													1																		1
Circular "	1				1		1		1																	1					5
Acute Alcoholic Insanity	1				1				3				1	1			1								1						9
Chronic Alcoholic Insanity	1	1	3		3	1			2				7	1	2	1					2										24
Hysterical Insanity		4		2		1		1		4																					12
Stuporous "			1		2				1												1										5
Typhomania					1								1																		2
Katatonia				1			2		1					1	1						1	1		1	1						10
Senile Dementia	1	1	3	5	2								1	6																	19
Paretic "	2		1		2	1	2		4					2	1		2								2						19
Hebephrenia			2	1	2	2	1	1	1	4			1	1	1	1										1					19
Typhomania								1						1																	2
Paranoia	4			1	2		2			1			2	5		2		2				2									23
Transitory Frenzy									1																						1
Hypomania										1																					1
Melancholia	5	3	4	8	2	15	2	1	13	12			1	21	2		2				3	6			2						102
Imbecility	1			2	1	2			3	1		1									1	2			1						15
	39	17	39	57	73	85	15	11	45	61	1	1	68	124	36	18	10	3			23	27		1	12	4		1	3	5	779

FEMALE DISEASES AND INSANITY. — In contrast with doctrinaire opinions advanced by many gynecologists with regard to the etiological influence of female diseases on insanity are the following statements of Dr. Margaret A. Cleaves, of the Harrisburg Hospital for the Insane (Report for 1882–3): She does not believe it will ever be possible to diagnose the special form of uterine or ovarian disease from the mental symptoms. The menstrual life of insane women is in many cases irregular, but in her experience not in the majority of instances. Cases of acute insanity are often accompanied by complete cessation of menstrual function. This is popularly believed to be the cause, and that if it can be restored, the patient will be restored to mental health. In some exceptional cases such is the fact, but the suppression in most cases is the result and not the cause, and most cases do not call for treatment of the reproductive organs alone. On the other hand, she does not believe that the sexual disease produced by the insanity has a tendency to result in self-cure. Her experience with cases of circular insanity indicates this. Her present opinion is that at least thirty per cent. of insane women suffer from genital-organ disease. In a large proportion of cases these affections have a direct or indirect etiological influence. Those who recover after having their utero-ovarian disease treated are much more likely to remain in mental health. This, however, does not justify the belief that the percentage of recoveries will be increased by special treatment. The error that these diseases caused insanity, and that this cause being removed the effect ceased, was at first Dr. Cleaves' belief; the "vicious circle" was ignored. Experience has shown her the contrary.

COMMUNICATED INSANITY.—Dr. H. M. Hurd (Report of the Michigan Pontiac Hospital for Insane, 1884) reports the following cases of communicated insanity: Two patients, sisters, were admitted within a week of each other, where the insanity of one had unquestionably been derived from the other, and a family of eight other persons had also entertained similar delusions. The sisters came from a neurotic stock. The maternal grandmother was epileptic in early life. The maternal grandfather was a drunkard, the father a gloomy, morose, unsocial man, the mother a woman of limited mental capacity. The eleven brothers and sisters of this woman were below the average in intellect. The patient first attacked had never been bright, and had received few educational advantages. At the age of nineteen, had an attack of melancholia which lasted about three months. Two years later she had another attack of melancholia in consequence of disappointed love. She subsequently married, and five months before the development of insanity, gave birth to a child. From the time of the birth of her child she was in a morbid mental state. While in this condition she went to reside in a house with her mother and a family of ignorant brothers and sisters. The

sudden death of a niece, a child of three years, from epilepsy, suggested to the ignorant family, after a council and much family discussion of the question, the conclusion that the child died in consequence of being "bewitched." The first patient immediately began to experience strange sensations. She had hallucinations of smell and of taste. She fancied herself suffocating, smelled strange odors, and heard strange sounds. These phenomena were regarded as the results of witchcraft. Soon other members of the family had similar experiences, and in the course of a few days the occupants of the house, ten adults in all, entertained similar delusions. They heard voices, smelled odors, were suffocated by stinks, and became wakeful, excited, and destructive to property. While under the influence of these delusions they were guilty of many extravagances. They cut little pieces from each finger and toe of the first-named patient in order to keep her blood running, being fully persuaded that if the blood stopped life would be extinguished by witchcraft. They also fired guns through the windows of the house to dispel the witches, cut off their horses' tails and slit up their cattle's ears to protect them from similar dangers. Finally, they so apprehended witchery as to not permit a single person to come near the house; all suffered for the necessaries of life. When a physician came to examine into the condition of the insane woman, he was attacked by a sister with a knife and received a dangerous wound. It at last became necessary to arrest and imprison the whole family before the excitement was checked. The first patient and the sister who committed the assault were brought to the asylum. As soon as they were removed the other members of the family dropped their delusions and in a few days were able to return home. The second patient, who was congenitally feeble-minded, and superstitious by education, relinguished her delusions, and in a few weeks was permitted to return home with her husband. She is now taking care of her family. The first patient admitted is still under treatment. In this instance, all the delusions which were entertained by other members of the family were unquestionably derived from one insane woman. Had she been surrounded by persons of healthy minds and fair education, who possessed the ability to discern the results of disease, it is probable that the insanity of the first would not have extended beyond herself.

Etiological Factors as Causes of Depression in Paretic Dementia.—Dr. Kiernan, Chicago, Ill., (*Alienist and Neurologist*, Jan., 1885,) says that he has observed, in thirty-four cases, that the majority presented at their outset depression. The etiological features, however, likely to result in depression, which presented themselves were as follows:

Locomotor ataxia preceded in . .	4 cases
Lues preceded in	4 "

Epilepsy preceded in	1 case
Myelitis preceded in	1 "
Paranoia preceded in	1 "
Senile insanity preceded in	1 "
Railroad injury preceded in	1 "
Menopause preceded in	3 cases
	16 cases
No depressing etiological factor in	18 "
	34 cases.

It is observable that the special differences produced by these depressing factors are that, in cases involving locomotor ataxia, depression always existed at the outset; those preceded by lues were as frequently optimistic as otherwise. These figures, therefore, tend to support the views advanced as to the frequency of depression at the outset of paretic dementia.

J. G. KIERNAN, M.D.

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e.—THERAPEUTICS OF THE NERVOUS SYSTEM.

THE ELECTRICAL REACTION OF THE OPTIC NERVES.—Dr. Davies in a communication to the Ophthalmological Society gives the results of his observations. He states that in all diseases in which temporary paleness of the optic disk occurs, the electrical excitability of the optic nerve remains normal. On the other hand, true atrophy of the nerve is shown by a diminution of the excitability, which thus enables us to detect the nature of the condition, where the ophthalmoscope and other methods fail.

To examine the electrical reaction he places the large positive electrode over the root of the nose, the small negative electrode over the upper and outer part of the eyeball in such a way that it rests on the orbital bone, and only lightly touches the eyeball. He then, commencing with a weak current, gradually increases the strength till a decided sensation of light is experienced. The number of cells and the deflection of the needle are then noted. The strength of the current is then diminished till the sensation of light ceases. This last is taken as the measure of excitability. In normal individuals $\frac{1}{10}$ milli-ampère with one or two elements is sufficient to cause the sensation of light. The same is true of congenital, hysterical and alcoholic amblyopia. On the other hand, in true atrophy it requires 3-8 elements and an electrical current of 3-100 milli-ampères.—*Deut. med. Zeitung*, 1884, No. 61.

HYSTERO-EPILEPSY CURED BY DIVISION OF THE CERVIX UTERI.—Flechsig, reports a case of hystero-epilepsy, in an eighteen-year-old girl, associated with dysmenorrhœa. Since the first appearance of the catamenia the patient had suffered from

hystero-epileptic attacks which came on in great numbers just before and during menstruation. In the intervals they were less frequent. She suffered also at these times from severe pain in the loins, vomiting, retention of urine. General weakness, loss of appetite, constipation, restless sleep, and an anxious state of mind were also complained of.

She consulted a gynecologist, who made out a stenosis of the external os, and dilated it. The dysmenorrhœa was relieved, but the convulsions continued, and even increased in frequency, so that on account of them she entered the hospital. On admission she suffered from symptoms of mental depression, shooting pains in the head, pricking feelings in the hands. There was a high degree of contraction of the external os uteri. She had one or more convulsive attacks nearly every day, and masturbated.

The cervix was divided (Nov. 17), and several wedge-shaped pieces of cervix were removed. She had three more attacks only—the last on Dec. 10th, when normal menstruation came on. From Nov. 19th she suffered from dizziness, pain in the region of the bladder, besides her former symptoms described above. These ceased about Jan. 8th, when also some mental symptoms (delusions, suicidal ideas, etc.), which had come on Dec. 24th, also ceased. The patient was discharged well Jan. 23d, and up to the following September had remained so.

THE SPINAL CORD IN HEALTH AND DISEASE AT THE REGION OF THE FOURTH AND FIFTH DORSAL VERTEBRÆ (*Lancet*, July 12 and Dec. 6, 1884).—Dr. Alexander Harkin, in two rather remarkable papers in the *Lancet*, has called attention to a spinal phenomenon, which, if his observations shall be corroborated, may prove to be of considerable practical value. Dr. H. claims to have found invariably "in every case of hysteria, chorea, neuralgia, facial paralysis, and other neuroses in females, the coëxistence of pronounced spinal tenderness on pressure over the fourth or fifth, more frequently the fourth and fifth, dorsal vertebræ; with this practical result, the almost invariable and rapid cure of those maladies by remedies applied over those vertebræ alone." At first he thought this tenderness a peculiarity of the female, but afterward found it also occurred in males. And still further observation showed that it "was in reality the normal condition of every healthy individual as well as of every age and class." Of 131 female children and girls from six to sixteen years of age, inmates of the industrial schools, every one complained of acute pain when tapped with the knuckles over the above-mentioned region, no pain being mentioned when the remaining twenty-two spinous processes were similarly rapped. Nearly similar results were obtained with 35 women in the penitentiary, 31 boys in the Malone Reformatory, and 300 men, members of the Royal Irish Constabulary. Some compare the pain to an electric shock diffused over the chest and arms, and others to the tingling sensation

caused by a punch over the ulnar nerve. Among the ailments which yielded so rapidly to counter-irritation over this region were trigeminal neuralgia, chorea, facial paralysis, acute hysteria, dysmenorrhœa, the reflex vomiting, the neuralgic toothache, and the pruritus pudendi of pregnancy, gastralgia, and other neuroses. When vesication was employed all painful symptoms disappeared with the formation of the blister.

In the second paper Dr. Harkin gives details of fourteen cases, illustrating these different affections, in which cure was rapidly effected by blistering over the fourth and fifth dorsal vertebræ. Among others is reported a case of ozæna in a girl, which apparently was so severe as to make her "unhappy and avoid society." A blister effected a cure. Dr. Harkin's cures are so extraordinary that one would naturally call to mind the popular mind-cures of the day, were it not for the cautious manner in which his papers are written.

Hypodermic Injection of Amyl Followed by Epileptiform Convulsions (*Practitioner*).—Dr. Sidney Ringer has noticed the occasional action of nitrite of amyl upon the heart, and the strange effect sometimes produced upon the nervous centres. He says: "I have seen one case where a woman immediately after a drop dose turned deadly pale, felt very giddy, and then became partially unconscious, remaining so for ten minutes." And again: "A delicate woman, after $\frac{1}{30}$ of a drop, went into a trance-like state." In a case described by Dr. Strahan, a chronic maniac, aged fifty-three, had suffered for several days from severe lumbago; a ten-minim dose of a ten-per-cent. solution of nitrite of amyl in rectified spirits was injected hypodermically. "Immediately after the injection the pain disappeared. He got up from the bed, and at my request stooped and touched the floor with his fingers. In, as nearly as could be guessed, about a minute and a half he suddenly became deadly pale, and sank back upon the bed." Then his head (bald), face, and neck became congested, and he was strongly convulsed for about half a minute. The convulsions affected the face and arms strongly, the legs slightly. The teeth were ground, and the breathing was suspended. In a few minutes, after coming out of this fit, he was attacked by a second one, during which the heart's action became very faint. He was made to inhale some chloroform, and the fits did not return. The lumbago entirely disappeared. This observation is interesting, as inhalations of nitrite of amyl have been recommended, both in this country and in Italy, to check the recurrence of epileptic convulsions.—*Journal of Mental Science*, July, 1884. [Weir-Mitchell first recommended nitrite of amyl in epilepsy after successfully controlling by it an obstinate case of continuous convulsions which resisted every thing else.]

Stretching of the Facial Nerve for Facial Spasm (*Arch. f. Pysch.*, 1884, xv. 13).—Prof. M. Bernhardt stretched the facial nerve in an obstinate case of tic convulsive of 4½ years' standing. The operation was followed by complete paralysis. Later the reaction of degeneration appeared. At the end of three months there was partial return of volitional movements, and of the faradic excitability in some branches. One month later the spasms reappeared, and soon the former condition was completely established.

Altogether, in the four cases observed by B., stretching had only a temporary result. With the disappearance of the paralysis following the operation, the spasms returned.

From an analysis of seventeen cases so far published, it appears that in only one case (Southam) was the operation successful. The results remained unknown in two, improvement followed in four cases, no effect in ten.

The Therapeutic Effects of Hypnotism.—In the *Neurologisches Centralblatt* (1885, No 3,) is given an abstract of Prof. de Giovanni's observations. Dr. G. obtained favorable results in cases of obstinate contractures, long-standing neuralgias, nervous sleeplessness accompanied with vomiting, and all kinds of convulsions. Attention is called to the danger from the careless use of hypnotism, which in some cases was followed by convulsions. One patient, who was cured by this means of hysterical contractures of the legs, etc., used to put herself to sleep on the slightest provocation, and consequently, it was thought, suffered from periodical convulsions.

Even when the sleep is not deep, Dr. G. obtained good therapeutic effects. The physiological effects noted are not particularly new. In one case pressure on one ovary caused the head to be turned to the opposite side, while when pressure was made on both ovaries the head was raised from the pillow.

In the discussion which followed the reading of the paper, Prof. Tamburini related two cases of hystero-epilepsy in which the attacks ceased after hypnotising the patients. While, in a third case, the attacks came on after hypnotism.

Prof. Morselli has hypnotized twenty persons, and has not seen any ill effects follow, but has been able to effect cures, as, for example, in hiccough.

Cannabin Tannate as an Hypnotic (*Berlin. klin. Wochen.*, 1884, No. 7).—Pusinelli was led by Fronmüller's recommendations of this drug as an hypnotic to make extended experiments to test its value. F. gave it in doses of 0. 1 to 1. 5 grms. and found no effect produced only in twelve cases out of sixty-four. Merk states that in the formation of the tannate an intensively poisonous substance, an etherial oil, is separated out. This oil, if injected subcutaneously, produces dangerous symptoms of poisoning, local and extensive abscesses, with high fever. Indian hemp

also contains this oil, but cannabin tannate is free from it, a fact which explains the mild effect of the latter, and the absence of poisonous symptoms. Pusinelli gave the drug sixty-three times, in doses varying from 0. 1 to 1. 5 grms. The cases embraced various forms of disease His results, on the whole, were good. He concludes as follows: It is a mild hypnotic, which deserves a place in the list of such drugs. Properly used, it is prompt in its action, and unaccompanied by other effects. It cannot always replace other hypnotics, but only when others are without effect from one cause or another. The indications for its employment are: 1, in purely nervous, habitual, and neurasthenic sleeplessness; and, 2, in the sleeplessness occurring in chronic, painless diseases, with prolonged rest in bed. Cannabin tannate is not an anodyne. The dose depends on age, etc., varying from 0.3 to 1. 5 grms. It is well to begin with 0.5 grms. to 1.0. The drug loses its effect only after it has been given for weeks. P. cannot agree with the extravagant praise of Fronmüller, who recommends it in the place of morphia, and in the sleeplessness due to painful affections.

THE CURE OF WRITER'S CRAMP (*Br. Med. Journ.*, Feb. 14, 1885).—Dr. De Watteville speaks highly of Mr. Julius Wolff's treatment of writer's cramp by massage and gymnastics. Dr. De W. having had the usual discouraging failures with all methods of treating this affection, put two well-marked cases under the care of Mr. Wolff, who had come over to England to demonstrate his method, and watched the results. The first case was of "many years'" duration, and the second ten. Both were severe cases. The operations of stretching massage and local gymnastics were repeated twice a day for from twenty-five to forty minutes each time. The first case remained under Mr. Wolff's care four weeks; the latter five (?) weeks. Both were cured. Dr. De Watteville mentions a third case, which he sent to Mr. W. after his article was written, and was still under treatment. "The case, one of the worst he ever saw, was of seventeen years' duration; and yet before a fortnight had elapsed, the use of the pen had returned to such a degree as to allow the patient to write for several hours a day, and with almost normal rapidity and firmness. Mr. Wolff's method is roughly as follows: the massage consists of rubbing, kneading, stretching, and beating of the fingers, and the several muscles of the hand and arm, with or without the simultaneous assistance of elastic bands. The gymnastic exercises are active and passive. The latter consists of fluxions and extensions of all the joints of the fingers, hand, and arm. Active exercises include systematic voluntary movements of the parts affected; and, if the general condition of the patient requires it, of all the limbs and trunk. As a rule, at least two sittings daily are required, extending from twenty to forty minutes each on an average; and in addition to this the patient may be required to practise the gymnastic exercises at home. Later on, graduated exercises in writing are prescribed.

POISONING FROM A CANTHARIDAL BLISTER (*Gazette des Hôpitaux*, 1884, No. 128).—Dr. Lautri, being attacked with pleurisy, applied, himself, two large blisters to his chest, anteriorly and posteriorly. Poisonous symptoms followed. The skin became warm, and covered with profuse perspiration, then cold; frightful headache; slight convulsions and delirium followed; severe pain in epigastrium and hypochondrium. There was also vomiting of a glairy, then bloody matter. He had a feeling of intense heat in the region of the bladder, but no erections, nor frequent desire to urinate. The acute stage lasted nine hours. Dr. Lautri remarks that poisoning by cantharides from blistering is very rare, and that his case differs from others in that genito urinary symptoms, which all writers describe as peculiar to cantharides, were absent, while symptoms of excitation general of the nervous system predominated; there were no symptoms of satyriasis and of priapism. The least noise, light, and the sound of the voice sufficed to bring on a spasm.

ACONITINE IN NEURALGIA (*Gazette des Hôpitaux*, 1885, No. 11).—Dr. Th. Guibert strongly renews the claims of aconitine for neuralgia. Its physiological action recommends it in the first place as a remedy. In neuralgia of the trigeminus the effects of the drug are truly marvellous, according to G. He cites a case of Nelaton's, in which the latter had resected all the branches of the nerves without effect. He was then about to remove the Gasserian ganglion, when, on the recommendation of Prof. Gubier, aconitine was given instead. At the end of a short time the patient was so well that he described himself as being in paradise. As some persons are very sensitive to the drug, G. recommends beginning with very minute doses, at long intervals, viz.: giving pills containing two fifths of a milligramme three times a day. If no amelioration follows this dose, it may be increased one pill a day till six are given in the twenty-four hours. If diarrhœa is produced the dose should be diminished. MORTON PRINCE, M.D.

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Inaugural Address, N. Y. Academy of Medicine, by A. Jacobi, M.D. (Reprint from *Medical Record*, February 14, 1885.)

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Sulla Malattia del Friedreich (Atassia Locomotrice Ereditaria), Note cliniche de Dott. Giuseppe Musso. Estratto dal *Giornale la Rivista Clinica*, Ottobre, 1884.

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Archiv. fuer Anatomie u. Physiologie.
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Archiv. fuer Psychiatrie und Nervenkrankheiten.
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Canada Medical Record.

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Centralblatt für Klinische Medicin.
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Original Articles.

METHODS OF STAINING NERVOUS TISSUE.

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DURING the past year a number of new staining methods have been discovered which enable the histologist to differentiate distinctly various parts of the nervous system. These methods have been published in different foreign journals, having originated for the most part in German laboratories. For the benefit of those who are studying nervous histology or pathology they are brought together and reproduced here, with a few additions which experience has suggested.

I.—WEIGERT'S HÆMATOXYLIN METHOD.

This is at present the most satisfactory of all the methods of staining, and is therefore given the first place. It brings out in strong contrast, even to the naked eye, the difference between gray masses and white fibres, and under the microscope differentiates so perfectly each fibre that it stands out like a stiff black hair in the field. The gray matter is colored a brownish yellow, the nerve cells being more deeply stained than the basis substance, and their nuclei and nucleoli coming out with great clearness. The network of fine fibres in the gray matter is demonstrated satisfactorily;

hence the method is of use in studying both the spinal cord, medulla, and brain cortex. Connective tissue does not retain the dye, and therefore in pathological specimens which contain sclerotic tissue this appears unstained and white in the dark field of normal substance. The sharp limitation visible to the naked eye makes class demonstrations of the location of system diseases easy, and under the microscope it is possible to contrast varying degrees of sclerosis, and even to count the number of axis-cylinders which have escaped destruction in the hardened area. The method is as follows: The specimen to be stained should be hardened in Müller's or Erlicki's fluid, and then cut into sections. If it has already been removed from the Müller's fluid and kept in alcohol it may be cut, but the sections must be placed in Müller's fluid for twenty-four hours before staining. In cutting the sections in either case the knife is to be wet with alcohol, and the sections are to be transferred to Müller's fluid and not to water or alcohol, as is customary. Having been placed in the Müller's fluid, and allowed to become thoroughly impregnated with it, the excess of fluid is removed by dipping the section for a moment into water, or by pouring a stream of water over it. The section must not, however, remain more than a minute in contact with water. It is then placed in the following solution of hæmatoxylin:

Hæmatoxylin (Merck's crystal.) . .	0.75
Alcohol (97%)	10.
Water	90.

This solution is prepared by boiling the hæmatoxylin in the alcohol and water until all the crystals are dissolved. It is then allowed to stand exposed to the light and air for four days before using. In placing the section in the hæmatoxylin it is well to spread it out flat upon a piece of tissue paper, as it becomes very brittle after absorbing the dye. The solution may be poured into a glass box, and the sections on their separate papers laid one upon another in it, but there should always be an excess of the dye. If the sections are large, the papers may be held apart by small bits of wood laid across their sides, in order to secure free

access of the dye to all parts of the section, else the staining will be deeper at the edges than in the middle. Very large sections should be stained singly to prevent this.

The glass box containing the sections is then covered and placed in an oven, whose temperature is kept at a point between 35° and 45° C. (95°–112° Fahr.). It remains there an hour. If the temperature rises above 45° the process is not spoiled, but the specimens are liable to swell; if it remains below 35° the sections are not clearly stained. After being heated in this way the sections become very brittle, and therefore it is a good plan to immerse the box containing them in a large basin of water after pouring off the excess of dye. They can then be floated out of the box on the paper in the water, and washed by renewing the water in the basin. The washing should be continued until no more dye can be extracted from the section. It then appears uniformly black. It is then transferred to the following solution:

Ferricyanide of potash (red prussiate) . .	2.5
Borax	2.
Water	100.

in which it remains until a portion of the hæmatoxylin is removed. The length of time differs with different sections. They may be ready for removal in half an hour. They may have to remain for twenty-four hours.

The solution of potash has the power of dissolving the dye out of the gray matter and connective tissue rapidly, but acts very slowly upon that which has been taken up by the axis-cylinder and medullary sheath. The desirable degree of staining for the gray substance is a matter of personal taste. The longer the section remains in the potash solution the lighter will be the staining. For thin sections of the cord or medulla the time required in the potash is not more than an hour. The exact stage of decolorization can be watched if the specimens lie in white porcelain dishes. When they are sufficiently decolorized the sections are to be removed and washed in water until no more of the potash solution can be extracted. They may then be dehydrated by absolute alcohol, cleared up with oil of

origanon, or cloves, or cedar, and mounted in Canada balsam. If a double stain is preferred they may be placed in a solution of alum-carmine before being dehydrated. This gives a pink color to the nerve-cells, but does not make them any more distinct than is done by the yellow potash. The only objection which can be made to this process is that the sections are rendered brittle by it, but if they are removed from solution to solution upon paper or a spatula, and not grasped at all by forceps, they need not be broken. Both the dye and the potash solution can be used a second time. It is sometimes impossible to conduct a staining process from beginning to end at one time. It may be a matter of convenience to leave the specimens indefinitely before the process is completed, They may be left in the staining mixture covered, or in the water after decolorizing with the potash, or in the alcohol used for dehydration, for any length of time. While they are in water after being dyed, and while they are in the potash solution, they should be watched. If left too long in the water they swell, if too long in the potash solution too much of the dye is removed.[1]

II.

Weigert has recently published[2] a modification of this method. He recommends that, after hardening in Müller's fluid, the specimen be placed in a saturated solution of neutral acetate of copper, which has been diluted with an equal part of water, and allowed to stand for two days in a heating box at a temperature of 40° C. From this it is removed to alcohol, in which it may be kept indefinitely. After cutting, the sections are placed directly in the hæmatoxylin solution, previously described, which is modified by the addition of a cold saturated solution of lithium carbonate in the amount of one part to one hundred of the dye. They remain in this for several hours, not being heated. Sections of spinal cord will stain in two hours; sections of brain must be left in a day. After removal they are treated

[1] Weigert's original article is to be found in the *Fortschritte der Medicin* Bd. ii., No. 6, 1884.

[2] *Fortschritte der Medicin*, April 15, 1885.

as in the other method by the prussiate of potash. Weigert claims that the pigment produced by the union of the dye with the copper salt is more distinct and more sharply differentiated than that produced with the chromic salt. The addition of the lithium carbonate changes the color from black to dark blue. I find that sections which have been cut may be placed in the copper solution for a day and then stained by the aid of heat. If this is done, the differentiation in the prussiate-of-potash solution occurs much more rapidly, and must be carefully watched. The advantage of this modification is, however, not very great.

III.—WEIGERT'S ACID FUCHSIN METHOD.

This method, like the preceding, has for an object a sharp definition of nerve fibres. It accomplishes the object equally well with the hæmatoxylin method, but has certain disadvantages. The gray matter is less deeply stained than in the first method, and there is no contrast between the color of the gray and of the white, except one of shade, both being a magenta. The process is also a more complex one, though it has the advantage of being a rapid one.

The nerve fibres are well stained when the process succeeds, the nerve cells are slightly stained, the connective tissue is hardly colored at all. In sclerosis of the cord the method has much value, as the line of demarcation between normal and degenerated columns is distinct. In general myelitis it is not satisfactory, little differentation between the pathological products being obtained. It is evident, therefore, that nothing can be obtained by fuchsin which is not better obtained by hæmatoxylin. The method involves the preparation of the following solutions :

Sol. No. 1. A saturated watery solution of acid fuchsin (Fuchsin, S. No. 130 of the Baden anilin factory).

Sol. No. 2. A saturated absolute alcoholic solution of caustic potash, diluted with an equal part of alcohol.

Sol. No. 3. A five-per-cent. watery solution of hydrochloric acid.

The section, however hardened, is after cutting, to be first washed in water, then placed in Sol. No. 1, in which it

remains one hour or longer, at the ordinary temperature. It is then removed and washed in water till the excess of the dye is taken off. It is then placed in Sol. No. 2, for a moment only, as it must be removed as soon as a distinction appears between the gray and the white matter. The gray matter will rapidly lose its color, while the section is in this solution, and the white matter will also be decolorized if the section is left in too long. A little experience will enable one to judge of the right moment for removal. The section is then placed in water, upon which it swims about as the alcohol evaporates, giving off red clouds of coloring matter. Here, too, it must be watched, and as soon as the clouds cease to be given off, it must be dipped in a fresh dish of water, and thence transferred to Sol. No. 3. This fixes the color definitely in the course of five minutes, when it is again washed in water, and then dehydrated with alcohol, cleared up with oil of cloves, and mounted in balsam.

If the section is thick it must remain several hours in the dye. If too much color is removed by Sol. No. 2, the section is to be washed in water and then replaced in the dye. If Sol. No. 2 has not taken out a sufficient amount of the color the section may be replaced in it at any time before it has been put in the oil of cloves. It is better, however, to have a specimen too deeply stained than too pale.

The sections do not become brittle in the dye, and no particular care is needed in the handling.[1]

Both of these methods of staining may be pursued with a specimen which has been embedded in celloidin. They have, therefore, some advantage over the carmine staining which has for so long been the favorite among neurologists. That staining is somewhat interfered with by the necessary soaking of the specimen in alcohol and ether, which precedes the embedding process. As no embedding mass can equal celloidin for convenience and cleanliness, this is an important consideration. It is to be remembered that celloidin is dis-

[1] The original article of Weigert is to be found in the *Centralblatt für medicin. Wissensch.*, 1882, Nos. 40 and 42.

solved by oil of cloves. Oil of origanon may be used to clear the section which is embedded, as it does not dissolve the celloidin.

I have secured a pleasing result by combining these two methods; using first the hæmatoxylin and then the acid fuchsin. The gray matter is by this means stained red, and contrasts well with the black lines of fibres. The nerve cells become somewhat more distinct than by the yellow stain of the potash salts alone, and the network of fibres in the basis substance is very distinct. It has a little advantage, therefore, over the combination of hæmatoxylin with carmine suggested by Weigert.

IV.—SEGUIN'S MODIFICATION OF THE ANILIN BLUE METHOD.

Anilin blue-black, or nigrosene, was used as a staining color by Sankey as long ago as 1872. Its use was revived by Bevan Lewis in 1882. He found it especially advantageous as a dye for the cortex of the brain. The solution which he used was a dark, concentrated one, and after immersing the section in the dye it could not be seen, and consequently it was occasionally broken in being removed. On account of this objection Seguin tried a weak solution of a color not too deep to be translucent. He recommends a solution of one to three or even four thousand parts of water. The section is to be first soaked in water after being cut, as alcohol interferes with the staining process. It is allowed to remain in the solution of aniline blue for six to eighteen hours, when it becomes a dark blue color. It is then washed in water until a distinct difference is apparent between the gray and white matter, or until no more of the dye will wash out. The gray matter is seen to be a deep blue, and the white is a lighter shade. The specimen is then dehydrated with alcohol, cleared up by oil of cloves, and mounted in balsam.

This method stains the nerve cells a deep blue, but does not enable one to distinguish the nucleus from the cell body. The fibres are only lightly stained and do not come out with great distinctness. Connective tissue is stained deeply;

hence sclerotic tissue can be contrasted with normal tissue very well. The process is a simple one and easily carried out. The result is, however, not as satisfactory as the old carmine method.

If a section first stained in blue is then colored with acid fuchsin the appearance is very striking, as the mixture of the dyes makes the gray cells very distinct, and the fuchsin at the same time colors the fibres. Such a combination, however, involves considerable time, and the result, when attained, is in no respects superior to that reached by the simpler hæmatoxylin process.

V.—SAHLI'S DOUBLE STAIN WITH METHYL BLUE AND ACID FUCHSIN.[1]

The specimen must be hardened in Muller's fluid or in a 3–4 % solution of bichromate of potash. It is to be stuck upon a cork with gum arabic, and put in alcohol only long enough to fix the gum. Specimens preserved more than a few days in alcohol cannot be stained without being first soaked for an hour in the bichromate solution after being cut. If the specimen is embedded in celloidin it must be cut very thin, or the celloidin must be removed after cutting. After cutting the specimen the sections should not remain more than ten minutes in water. They are then placed in a concentrated watery solution of methyl blue for several hours, until deeply stained. They are then washed in water to remove superfluous dye, and placed in a saturated watery solution of acid fuchsin for five minutes. After the excess of fuchsin is removed by washing in water, the section is placed for a few seconds only in a 1 % alcoholic solution of caustic potash, and then again in water, where the differentiation takes place. The gray matter is stained red, the white matter is stained blue. Dehydration with alcohol, clearing up with oil of cedar, and mounting in balsam complete the process.

Sahli claims that when this stain does not succeed the difficulty lies rather in some defect in the hardening process than in a defect in the staining process. The fuchsin stains

[1] *Zeitschrift für Wissensch. Mikroskopie*, ii., S. 1.

the axis-cylinder, the methyl blue stains the medullary sheath. In some fibres, however, the medullary sheath is stained with fuchsin instead of with blue, and Sahli hazards the conjecture that the difference of selective action of the sheath to absorb the blue or the red dye indicates a difference of function in the fibre which the sheath surrounds.

Repeated trials of this process have convinced me that the varying colors obtained is a matter of accident, depending upon the length of time the section is left in the various fiuids. If after staining with blue they are left too long in water much of the dye is dissolved out. If after staining with fuchsin they remain a few seconds too long in the potash too much of the fuchsin is dissolved out. Thus a slight variation in the process gives results which differ greatly. The conjecture of Sahli seems therefore unwarranted.

VI.—SAHLI'S METHYL BLUE STAIN.

Sahli has also proposed[1] a single stain obtained by placing sections, however hardened, for ten minutes in the following solution:

Sat. sol. of methyl blue	24 parts.
5 % sol. of borax	16 "
Water	40 "

Mix. Stand for twenty-four hours and filter.

They are then removed, washed in water to take off the excess of the dye, and dehydrated with alcohol. As the alcohol also dissolves out the dye they must not be left more than five minutes in it. They are then cleared up with oil of cedar and mounted.

This method has the advantage of being rapid and simple. It gives a clear blue color, and the fibres appear quite distinctly differentiated from the surrounding substance. The only objection is the rapid fading of the dye when exposed to light, which prevents its use for any specimen which is to be preserved.

[1] In the same Journal.

VII.—THE SAFFRANIN STAIN.

This stain was proposed about a year ago by Adamkievicz,[1] and has been used by him in the study of pathological specimens. By means of it he claims to have observed a constant change in the vesicular column of Clarke in cases of locomotor ataxia, consisting in a disappearance of the fine reticulum of fibres which surrounds the cells of that column. The advantage of the stain is its power to bring out the finest fibres in the gray matter. The process is as follows:[2]

The specimen, however hardened, is cut, and the sections washed in water. They are then dipped in distilled water, which has been acidulated by a few drops of nitric acid. Thence they are transferred to a saturated solution of saffranin, where they remain from a few minutes to several hours, according to their thickness. Then the excess of the dye is removed by washing in alcohol, and the section is dehydrated by absolute alcohol. If a double stain is desired, it may now be washed again in water which has been acidulated with acetic acid, and then put in a concentrated solution of methyl blue. After a few hours it is taken out, washed in alcohol, dehydrated, and mounted. Specimens which have been hardened in alcohol show to better advantage by this method than those which have come in contact with chromic salts. The dye is taken up by the medullary sheath, and not by the axis-cylinder. The depth of color obtained will vary with the time the section remains in the dye, and the time it is allowed to stay in the alcohol subsequently to staining.

My own results with this method have not been satisfactory. So much of the dye is removed by the alcohol of dehydration that the specimen is very pale, and it is with difficulty that the fibres are seen. They certainly do not appear as distinctly as in the acid-fuchsin method.

These are the methods which, among a large number re-

[1] *Anzeiger der K. Akad. d. Wissensch.*, iii. Abt., 1884, No. 7.

[2] For the details of this method, as well as for many useful suggestions regarding technique, I am indebted to Dr. C. F. Freeborn, Instructor of Technique at the Col. of Phys. and Surg., N. Y.

cently brought forward and tested, have seemed of sufficient value to warrant mention. Each has its peculiar advantages, as already stated. The hæmatoxylin and fuchsin methods of Weigert are of the greatest importance, and should be adopted by all who are doing pathological work here, as they have already been adopted in Germany. In staining embryonic tissue they have been of great service, and a number of discoveries of new tracts and bundles of fibres have been made by their aid. The dye in both cases is taken up by a portion of the medullary sheath, called the chromoleptic substance. Hence, in a fœtal brain, where some tracts are medullated and others non-medullated, these dyes select the medullated parts and define them clearly. In staining normal specimens they are also of service, since the various constituents of nerve tissue are differentiated distinctly. In staining sclerotic tissue their advantage has already been noticed. These methods are superior in all respects to the older carmine method, and should take its place.

No. 34 West Thirty-eighth St.

MASSAGE IN NERVOUS DISEASES.

I.

PHYSIOLOGY.

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Introduction.

THAT the question of the influence of massage upon the nervous system is a perfectly legitimate one, must be acknowledged. The advantages which are claimed to have accrued to other specialties through its use are so great, that we neurologists are naturally anxious to discover whether we also may not find it a valuable adjuvant. Nervous diseases are frequently so obdurate, and their treatment so perplexing, that it is necessary to have at our command every therapeutic agent that offers any increased hope of success. In order to establish its actual value it will be necessary to specify as clearly as possible the indications for its use, and also to oppose the exaggerated hopes and assertions of certain authors. Years of experience and practice are necessary in order to gain a clear idea of its action, and not to be misled by apparent results, which would probably have been attained by any other remedy. It is a fact worth meditating upon, that as yet we have not decided upon the value or worthlessness of massage in these affections, and that such a work of revision and inquiry should still be requisite. As a reference to any general work upon massage will show, we are notdealing with a new the ra-

peutic measure, or with one which has lately been applied as such, but with one which is among the oldest, and which is probably even older than medical literature itself. The manuscriptory evidence of its use dates back to three thousand years B.C., and traditional proof of its existence is still older than the documentary evidence.

The history of the use of massage in diseases of the nervous system can be told in a few words. According to *Plutarch*, Julius Cæsar subjected himself daily to a pinching of the entire body, as a means of relief from a general neuralgia. *Celsus* says: "Chronic pains of the head are relieved by rubbing the head itself." "A paralyzed limb is strengthened by being rubbed."

Paullini ("Flagellum Salutus," 1698) cites historical passages which show that flagellation, percussion, *claquement*, and *ebraulement*, have cured melancholia, insanity, paralysis, and epilepsy. But as he also claims that deafness, toothache, luxation of the maxilla, deaf-mutism, goitre, empyema, pleurisy, obstinate hiccoughs, irregular menses, and many more ills that flesh is heir to, have been cured by this means, we can only mention it as having historical interest without further criticising the value of the testimony.

In 1808 *John Barklays*, in an essay upon the muscular actions of the body, published in Edinburgh, relates a case of severe muscular contracture which, not being curable by any other means, was finally cured by beating of the sterno-cleido.

In 1818 *Piorry*, in the "Dictionnaire de Médecine," published in sixty volumes, spoke of the anæsthetic actions of massage, and even relates the following case in support:

"The wife of one of the most distinguished savants with which France is honored, is relieved from a severe rheumatic pain to which she is subject, only when a pressure analogous to massage, is exercised upon the affected part. This remedy is not curative with her, but it is certain that it relieves the pain."

Balfour, Edinburgh, 1819, in a book entitled "Illustrations of the Power of Compression and Percussion in the Cure of Rheumatism, Gout, and Debility of the Extremities,

and in Promoting Health and Longevity," makes some general remarks which approach modern accepted ideas. In 1837 *Dr. Martin* addressed a Mémoire to the Société de Médecine, in which he extols the action of massage in lumbago, and mentions over one hundred cases which were benefited by this means.

About thirty years ago Meding used massage successfully in the treatment of writers' cramp. These few facts, notwithstanding that they should have been sufficient to at least attract attention to the action of massage in nervous diseases, were until within a very few years all that was known upon the subject.

The general literature of massage is very large, particularly among those nations by whom it was soon accepted—namely, Norway, Sweden, France, and England. It is only since about ten years that this method has been recognized by Germany; and American authors, with the exception of Douglas Graham, of Boston, have paid it very little attention. As regards its relations to nervous diseases, we can find very little; nothing which would entitle us to a positive opinion as to its value. One author attaches more importance, another less, according to individual dexterity and the amount of experience.

Physiology.

The question as to the physiological action of massage is probably the most important; without a thorough comprehension of its *modus operandi*, its successful application, no matter how dexterous we may be mechanically, will be a matter of impossibility. The form to be used, the velocity of the blows in *tapotement*, the force of the beat, or the lightness of the touch,—in short, the discrimination between minutiæ, which is so essential, cannot be effected unless we are able to satisfactorily answer the question which we should always propound to ourself in a given case: "What do you desire to accomplish?" The manner of doing it is entirely secondary, and is a natural result of the correct answer to our question.

The general physiology of massage is, if we are expected

to believe all the results claimed to have been obtained, almost commensurate with physiology itself. Indeed, in order to explain all these successes, it would be necessary not only to bring into requisition all that is known of general physiology, but also then to confess our inability and ignorance in regard to many points. The older writers explained all the phenomena produced by massage by saying: "It increases the action of the skin, it strengthens the muscles, and decreases nervous irritability." Just what was explained by this paraphrasing probably no one knows, notwithstanding the fact that a very recent book upon the subject eludes explanation by a similar system.

It is essential to be on our guard against theories; the only deductions permissible are those from facts. When a person argues, as *Neumann* does,—"Since peristaltic contractions of the stomach may be increased by excitation of the pneumogastric and the parts of the brain where it originates, therefore in chronic gastric affections pressure upon the pneumogastric and beatings of the back of the head are useful,"—then indeed is it imperative for us to separate the chaff from the wheat. It is not the object of this paper to enter at all into the general physiology of massage, but only to attempt to show in how far and in what way massage is capable of influencing the nervous system, either directly or indirectly. Its influence may be produced directly by:

a. Nerve or muscle stimulation (excitant action).

b. By nerve or muscle depression (sedative action).

Indirectly by:

a. Action upon the lymphatic system.

b. Local or general action upon the blood current.

c. Reflex action.

We will first consider its indirect action.

I.—ACTION UPON THE LYMPHATICS.

Through the labors of *Ludwig* and his pupils we have become thoroughly acquainted with the physiology of the lymphatics and the laws which govern the flow of lymph. We know that the motion of this current is brought about

by various factors, chief among which is the action of the muscles between whose tendons the lymphatics take their course. While the muscles are at rest the flow of lymph is very sluggish, but as soon as muscular action is developed, an increase in its rapidity takes place. *Colin* ("Traité de physiologie comparée des animaux domestiques," Paris, 1856) has practically and conclusively proven that muscular movements do exert this action. He found that when a tube was introduced into any of the lymphatic vessels of the neck in the larger ruminants, the discharge of fluid during a certain period of time, was from one fourth to one half greater during mastication than during repose. If, then, muscular action in general has this effect, we would be justified in expecting a similar result from massage, and that massage does increase the rapidity of the lymph current is shown by the experiments of *Lassar* (Ueber oedem und Lymphströmung bei der Entzündung, *Virchow's Archiv*, B. 69, xxix., p. 516) and by those of *v. Mosengeil* (Verhandl. der Deutschen Gesselschaft für Chirurgie, 4th Congress, Berlin, 1875, pp. 159 and 160).

Lassar produced an artificial inflammation in the paws of dogs. The principal vessels were then severed. If passive movements were then executed with the inflamed limb, or massage applied to it, the lymph poured out in a stream from the divided ends of the vessels. An analogous effect may also be produced upon the lymphatic glands. Whereas electrical excitation has no influence upon their secretion, mechanical irritation produces a strong flow of lymph. We thus see that massage has a direct influence upon the acceleration of the lymph current, and therefore promotes the absorption of pathological products. V. Mosengeil's experiments clearly elucidate this last point. Into various joints of rabbits he injected a concentrated solution of black india ink. Certain joints were then massaged repeatedly, and others, for purposes of comparison, were not treated at all. The swelling, which occurred after the injection, disappeared much sooner from the massaged joints than from those not so treated. The animals were then killed and the joints opened. Those joints which had been manipulated during

a certain period of time were found to be entirely free from the ink, whereas a considerable amount of ink was present in those which had not been treated. Numerous deposits of ink were found also in the interstices of the muscles and along the course of the lymphatics for a considerable distance above the joint. Upon the non-massaged limbs these deposits were entirely absent. The crural and subcrural muscles in particular were the seat of a black inky discoloration, whereas upon the non-massaged limb they retained their normal red color. The centrally situated lymphatic glands of the massaged extremity were colored intensely black, and the lymphatics leading to them were prominently designed as black cords. These deposits of color were entirely absent upon the other limb. By these experiments, therefore, it was distinctly shown that the absorption of normal and pathological products by the lymphatics is very much aided by massage.

V. Mosengeil very strikingly compares the mechanical action of massage upon the lymphatics to the action of strokings executed upon an elastic rubber tube which is filled with fluid, the lower end of it being immersed in a reservoir of the same. The continuous advancing pressure thus forces the fluid forward; that part of the tube then from which the pressure has been removed as the hand glides forward, becomes dilated by its own elasticity, and sucking up the fluid from the reservoir, thus refills itself. The conditions in the human body are, if any thing, even more favorable than this, for here the veins and lymphatics are supplied with valves which prevent a retrogression of the fluid.

We are therefore entitled to conclude that:

1. Massage accelerates the flow of the lymph current.

2. Massage sometimes produces, always aids, the absorption of pathological products, which are through it forced into the centripetal lymphatics.

2.—ACTION UPON THE CIRCULATION.

The action of massage upon the circulation is produced in various ways. The lighter manipulations, such as light

effleurage for instance, act in very nearly the same manner as any irritation of the skin ; and that dermal irritants have an indirect action upon the circulation is well known. The experiments of *Naumann*, *Schede*, and others, show that weak irritation of the skin produces contraction of the vessels, and consequently an increase in the velocity of the blood current. Strong irritants produce the reverse—a dilatation of the walls of the vessels, and therefore, as a direct result, a retardation in the rapidity of the current. If we were to apply these facts directly to the lighter manipulations, our inference would be : weak effleurage produces increased rapidity of the blood current ; strong effleurage decreases its rapidity. We have, however, another factor which enters into consideration, and that is the purely mechanical action of effleurage. By this action the blood is forced directly forward and the action of strong effleurage is antagonized. Therefore our second deduction is incorrect. Practically, what we find is, that effleurage in any form increases the rapidity of the blood current.

The stronger forms of massage, such as *pétrissage* and tapotement, act in a different way ; their action upon the vaso-motor nerves and upon the muscular fibres of the walls of the vessels is analogous to that produced by other modes of irritation. The innervation of blood-vessels, we know, is brought about in two ways : first, by ganglia in their walls, and secondly, by exterior nerves which when irritated have an influence upon the lumen of the vessel.

These ganglia and nerves, as well as the muscular fibres in the walls, may be acted upon either directly or indirectly. The direct action of mechanical irritation upon them is shown very nicely by Goltz's "Klopfversuch." By means of this well-known experiment Goltz showed that there is produced a change in the vessels themselves which chiefly concerns their contractility, and which is entirely independent of the action produced reflexly upon the heart by means of the pneumogastric. If the abdomen of an animal upon whom this experiment has been performed be opened, the vessels of the peritoneum as well as those of the abdominal cavity will be found dilated and distended with blood.

This is particularly noticeable upon the veins. The result of this species of tapotement, or beating, is, then, a distension of the vessels due to paralysis of their walls. If this same experiment be performed upon an animal with an opened abdomen, so that the changes take place directly under our observation, the blows being applied to the stomach and intestines, we notice at first an increasing pallor spreading over the peritoneum, due to contraction of the vessels. In a short time, however, if the beating is not interrupted, a dilatation of the vessels takes place which is ultimately increased to complete paralysis of their walls. Indirectly also we are able to act upon the blood-vessels by means of the sensitive nerves of the skin, which then reflexly act upon the vaso-motor nerves. *Zabludowski* (Physiologische Wirkungen der Massage, etc., *Archiv für klin. Chir.*, p. 374, 1884,) in his experiments upon dogs, noticed this fact, that there is a reflex action from the sensitive nerves upon the pneumogastric. The natural tonus of this nerve seems to be diminished by massage of the skin. In a dog, upon whom the skin of the thigh was massaged, the pulse, which at the commencement of the experiment was twenty-six per minute, rose quickly to sixty-four. The massage then being kept up for a still longer period it gradually fell, and at the end of the séance had fallen to thirty-six. As a check experiment the vagi were then cut and the massage applied in the same manner as previously. This time the increase in pulse failed to occur. Therefore from these various facts we are entitled to say:

1. Massage has an influence upon the local and general blood supply.

2. Massage executed for a short period of time, up to a certain point, produces contraction of the vessels, and thus localized anæmia.

3. Massage kept up for a longer period produces a dilatation of the walls of the vessels, and thus hyperæmia of the part.

4. Massage acts upon the general circulation by reflexly increasing or decreasing the contractile power of the capillaries, and thus increasing or decreasing the velocity of their circulation.

3.—ACTION UPON THE NERVES.

As long as general physiology cannot inform us what nerve conduction really consists of, so long will there remain a number of points in nerve physiology which we will have to acknowledge as facts, but which cannot be satisfactorily understood. The various theories explanatory of the process of nerve conduction have been very numerous: The direct mechanical theory, according to which a movement of the entire nerve is produced, analogous to the ringing of a bell by pulling upon a wire; the theory of wave-like propagation; the electrical theory, upon the strength of *Dubois-Reymond's* experiments; the theory of a chemical change in the nerves,—all these have been advanced, accepted for a time, and ultimately either rejected, or labelled with the Scotch verdict of "not proven."

Lately *Mortimer Granville* has advanced the theory that all cells and fibres vibrate during action, and thus has endeavored to explain the results attained by his so-called "nerve-vibration," to which we shall again refer.

Heitzman and others, for whom cells do not exist, and for whom the entire body is one mass of connected living matter, believe that nerve conduction consists in a contraction of this living matter, propagated by contiguity.

These latter theories, also, do not fill the void any more than the former. We will be obliged to keep strictly to those physiological facts which have been gained by experiments, and leave the correct theory to be proven later, if possible. What light can be cast upon the subject by this mode of examination will have to suffice. What we do know positively is, that the nerve is not only an intermediary between excitable parts, but that it can also be excited itself in any part of its course. This action of excitation consists only in that, that the process of conduction, whatever that may be, which is normally originated in the excitation organ, is artificially introduced at any part in the course of the nerve. We know that physiologically such excitations in the course of nerves do not occur; but we also know that the result is always the same, and is entirely independent of the seat of irritation. It is totally immate-

rial whether the irritation originates from the physiological point, or whether it is artificially introduced at any point along the nerve. Irritation of a motor fibre always produces contraction, whether this irritation occur as the result of will power, of reflex action, or is artificially produced; and so also irritation of a sensitive fibre produces sensation, and that of any nerve of special sense will produce that special sense, as, for instance, pressure upon the optic nerve will produce an impression of light. It is important for us to recognize these phenomena, and to know the laws which govern them. What process it is that takes place during their production, and upon which they are dependent, is after all, for our purposes, only of secondary importance. The facts, then, which will probably elucidate the action of massage upon nerves better than any amount of theorizing, are those physiological experiments which were made with a view to determine the action of mechanical irritants in reference to the excitability of nerves. In the majority of physiological experiments made to determine this point electricity was made use of as the source of irritation. Unfortunately, however, this force consists of a number of conglomerate factors, chemical, thermal, and perhaps some unknown ones, which render the deductions from experiments so conducted somewhat difficult. Independently of this there are other reasons which make the results of these experiments with electricity useless for our purpose. These reasons consist in the diffusion of the current, in the unipolar action, etc. The excitant to be used, in order to be made available for comparison with massage, must be capable of being applied directly to a nerve without producing any chemical change in its substance, and at the same time of being so localized as to act only upon a single spot. These factors we have in purely mechanical irritants, as well as in massage. In the experiments with purely mechanical irritants, pressure, extension, and percussion are the ones which have been most used. In practical massage these three manipulations, especially the last one, will be found to possess the greatest action upon nerves. The results of these physiological experiments will, then, satisfactorily explain the phenomena produced upon nerves by massage.

a.—Tapotement—Percussion.

Physiologically, one of the oldest known facts in experimental nerve physiology is probably that every mechanical irritation, from a slight touch to entire crushing of the nerve, can produce a contraction of the muscle supplied by the irritated nerve. In *Haller's* "Physiology," published in 1766, attention is called to this fact, and we also there find an acknowledgment of its having been known by the ancients. Haller made use of simple touching, cutting, or tying as an irritant. *Haidenhain*, in 1856, by a process of reasoning and by deductions from the above and from other well-known facts, arrived at the idea that mechanical irritation, not sufficiently strong to produce disintegration of its constituent elements, might, nevertheless, cause sufficient action to produce excitation.

He therefore made experiments in this direction, and the results proved the correctness of his supposition. Thus by inducing strong vibrations in a pair of forceps and holding them to a nerve, he produced a true tetanus in the muscle supplied by the nerve. The tips of the forceps were covered with ivory plates, and these were placed in direct contact with the nerve. Thus every possibility of electrical action was excluded. After this Haidenhain constructed a special apparatus for tetanizing muscles, and called it tetanomotor. This apparatus consists of an ivory hammer, which, being drawn upward by means of an electro-magnet, is allowed to fall down upon the nerve whenever the connection is broken. By these experiments the proof was gained that it is not necessary to destroy a nerve in order to mechanically excite it. There was very little more known about the reaction of nerves to mechanical blows than this until about ten years ago. The reaction of nerves to single mechanical blows is even of more importance for our purpose than that of mechanical tetanization of a nerve. These, however, have been employed in physiological experiments even less than the latter. The experiments of *Eckhard* and of *Wundt* ("Untersuchungen zur Mechanik der Nerven," Bd. i., pp. 196–202, 1871) are the only important ones. Wundt's experiments were addressed particularly to the investigation

of the secondary or late action of single blows falling upon a nerve. He came to a very important conclusion, and one which is of great service to us in enabling us to comprehend the action of massage in general and of tapotement in particular, and that is: *Weak mechanical excitation, which is insufficient to produce a contraction*, nevertheless increases the irritability of the nerve to directly applied electrical currents; or, in other words, an amount of irritation so small as to be unable to produce any contraction of a muscle, is, however, able to produce an increased excitability. The most careful and most complete experiments in this field are those of *Tigerstedt* ("Studien über mechanische Nervenreizung," i. Abth., Berlin, 1880). The apparatus which he used is rather complicated, as may be seen from the following qualities which it possesses. For a full description we refer to the original work. 1. It allows of the measurement of the intensity of the irritation. 2. It admits of an increase in the force of the irritation from zero to a given maximum. 3. It allows the nerve to be irritated at any point along its course, from its exit from the spinal column to its entrance into the muscle, without moving the nerve. 4. It is so constructed that the falling weight rests only the shortest possible time upon the nerve, and thus no more pressure than necessary is exercised upon it. 5. It allows of the simultaneous application of some other mechanical irritant than blows from the hammer. 6. It prevents exsiccation of the nerve. 7. The apparatus may be used together with the ordinary instruments for recording muscular movements. Tigerstedt thus found that, in allowing a certain amount of time to intervene between each experiment, the nerve possesses a great deal of endurance, and that, if he was careful that it did not dry out, but kept up a supply of moisture, *no particular destructive action was produced by the mechanical irritation.* He then made another series of experiments in reference to the endurance of nerves to quickly consecutive strokes. It was thereby shown that *the nerve endures these quickly repeated blows very well.*

During the course of these experiments several peculiarities were noticed, which deserve special mention, and

which are particularly important in bearing a direct practical relation to massage. If one and the same place in a nerve was repeatedly irritated at short intervals, it was noticeable that the contractions increased in intensity up to the third or fourth contraction, which limit being reached, they remained stationary for a certain length of time. If an interval of from 2–3 minutes was allowed to elapse between each irritation, it was noticeable that, after a repetition of irritation of the same amount of intensity, no similar increase in the force of the contraction took place. Therefore the cause of this phenomenon, the increased excitability, must be sought for in the frequent repetition of the irritation within a short space of time. Such repeated irritations, therefore, seem to produce some molecular change in the structure of the nerve which enables it to react more forcibly to one and the same excitation. When the maximum has been reached it remains constant during a long period of time, before, in consequence of exhaustion of the nerve, the muscular contractions begin to decrease in intensity. Practically, what we know of the action of tapotement corresponds to the results of these experiments.

1. Light tapotement increases the irritability of the nerve.

2. Quickly repeated tapotement increases the contractility of the muscles supplied by the nerve operated upon.

3. Slow and strong tapotement produces exhaustion of the nerve.

These statements can none of them, except the first, be taken categorically. The second is true only up to a certain point, but if kept up for a long period of time, exhaustion of the nerve occurs. The action of tapotement upon *sensitive nerves* is similar to its action upon motor ones; just as light tapotement increases the irritability of a motor nerve and thus promotes the contractile power of the muscles, so when applied over a sensitive nerve we notice at first an increase of the pain, which, however, soon subsides, then disappears, and ultimately is replaced by complete anæsthesia. Naturally, the more delicate the nerve in its anatomical con-

figuration, the less is the amount of force and time necessary to reach this result. Experiments upon man or animals in reference to the excitability of sensitive nerves to mechanical irritants, do not exist. Whatever investigations may be made in this direction will naturally be entirely subjective, as the results will depend upon the evidences of pain given by the subject. *DeWatteville* has found that there is cumulative action in sensitive nerves analogous to that observed in motor ones. DeWatteville's experiments were conducted with electricity as an irritating agent. Very soon after beginning to use percussion as a treatment for pain, we made a similar observation in reference to the action of tapotement upon sensitive nerves. The greater the frequency of the blow, the more the pain is increased. Thus very rapid and light percussion applied to a sensitive nerve which is the seat of pain, will increase that pain instead of alleviating it. This fact, however, only holds good up to a certain point, for if we continue the percussion for a sufficient length of time we will eventually obtain relief. Practically, however, this is not feasible, for many patients cannot endure the increasing pain long enough to reap the benefit of their perseverance. Therefore, notwithstanding opinions to the contrary, it is better to begin the treatment of a neuralgia with strong and slow blows, or with some other form of massage—effleurage for instance,—and only when the pain has almost subsided, to make use of rapid blows. Naturally the rapidity and the force of the blow will depend upon each individual case. A light blow over the sciatic, would become a very severe one if applied over the supra-orbital. These practical points were obliged to be interpolated here in order to explain the cumulative action to mechanical excitants, which takes place in sensitive nerves.

b.—Pressure and Extension.

All effleurage, or kneading, applied over nerves produces extension of the terminal filaments. For this reason we can treat of the various manipulations, with the exception of percussion, in reference to their physiology under the one heading of "Pressure and Extension." This is all the more

justifiable because, as has been shown by *Valentin* about twenty years ago, extension of a nerve acts analogously to an increase of pressure applied to it; for by extension the nerve sheath presses laterally upon the softer medullary substance, and the medulla in its turn presses upon the axis-cylinder. Therefore, the experiments made in reference to the action of one, will also cast light upon the action of the other. Physiologically, during every movement that is made, even through every change in the position of the body, an extension and pressure is exercised upon the nerves: extension, by the movements themselves; and pressure, by contraction of the various muscles and groups of muscles. For this reason we need not be surprised that physiologists early began to inquire into the *modus operandi* of extension and pressure, naturally without a thought of the practical bearing of the result. Valentin, who was the first to experiment in this direction, produced extension of the nerves, by hanging weights to the nerve trunks of the extremities of a decapitated frog. The excitation used was the induced current. The result of his experiments was,—that a moderate amount of extension has no influence upon the excitability of the nerves, whereas a greater amount reduced it. Here, no mention of an increased irritability, occurring at any time, is made. *Haber* (*Archiv für Physiologie*, 1859, p. 109), and later *Cornet* and *Ranke* (J. Ranke: "Die Lebensbedingungen des Nerven," Leipzig, 1868, p. 122), found that a certain amount of extension, the amount, however, not being specified, increases this irritability. *Schleich* (*Zeitschrift für Biologie*, 1871, p. 370), *Tutschek* (Ein Fall von einer Reflexepilepsie, geheilt durch Nervendehnung. Dissert., München, 1875), *Conrad* (Experimentelle Untersuchungen über Nervendehnung. Dissert., Greifswald, 1876), and *Vogt*, all did not succeed in adding any thing to our knowledge. Tigerstedt, in 1880, made the action of the milder forms of extension a special object of study. He made a number of experiments in reference to the increase and decrease of irritability of a nerve after extension, and his results were constant and conclusive. They show incontrovertibly, that the irritability of the nerve increases under

slight extension, but that it again sinks when extension is increased above a certain point. In reference to the first of these two points, he found that a gentle extension, which was gradually increased from 0–25 grammes upon the sciatic nerve of a frog, produced a gradual and continuous increase in the irritability of the nerve. This point, however, being surpassed, a decrease began to take place. Practically we can, of course, not express in definite terms what amount of pressure or extension is to be applied in order to produce the desired effect upon certain nerves. We can only qualify it by the terms light and strong. The diameter of the nerve, the elasticity and thickness of the perineurium and of Schwann's sheath, and even the individual irritability will naturally exert a modifying influence. One thing is sure, and that is that pressure applied directly has more influence upon the nerve than when applied indirectly in the form of extension.

Zederbaum (*Archiv f. Physiologie*, 1883, p. 160. Nervendehnung and Nervendruck), whose experiments in reference to direct pressure are the most valuable, has shown that when a large amount of pressure is applied to a nerve at once, the irritability decreases rapidly, but that this decrease is not nearly so marked and takes place more slowly, when the pressure is gradually increased up to the same amount. The action of pressure or extension upon sensitive nerves corresponds very nearly to that upon motor ones. *Luderitz* (Versuche über die Einwirkung des Drucks auf die sensiblen und motorischen Nerven. *Zeitschr. f. klin. Med.*, Berlin, 1881, Bd. ii., Heft i.), however, has shown that they possess a greater power of resistance than motor nerves, and that motor nerve fibres are much more easily paralyzed by continuous pressure than sensitive fibres. What we really know then, and what is of practical value, is:

A mild pressure or extension, increased up to a certain point, will correspondingly increase the irritability of a nerve; increased beyond that point, it will decrease or abolish it. This change in the irritability of the nerve, be it an increase or decrease, lasts for some time after the source of pressure or extension has been removed.

4.—ACTION UPON THE MUSCLES.

Massage, acting as a mechanical irritant, exerts a special influence upon muscles. Besides its indirect action through the nerve which supplies the muscle, and by means of the increased circulation which it produces, thus increasing the nutrition, it also exerts influence upon the contractile power of the muscular fibres themselves. Thus it is necessary to keep muscle irritation and nerve irritation distinctly separated. According to *Pick* (Zur Lehre von den Wirkungen der mechanischen Muskelreizung. *Prager med. Wochenschrift*, 1884, pp. 123, 136, and 145), the first observations in reference to the idio-muscular furrow, which is the contraction of a muscle limited to the point of irritation and brought about by mechanical excitants, were made by *Bennet-Dowler* in 1846. In 1851 *Schiff* commenced his work upon this subject, and to him we are indebted for the expression, "idio-muscular" contraction. If in a warm-blooded animal he stroked or percussed a muscle in a transverse direction to the course of the fibres, a localized stationary elevation of the fibres at the point of irritation was noticed. The eminence which was thus formed lasted for some time after removal of the irritant. This phenomenon was noticeable not only upon living but also upon dead animals. In 1861, *Auerbach* (Ueber topische Muskelreizung. *Jahresbericht der Schlesischen Gesell.*) made similar experiments upon human beings, but using the blows from a percussion hammer as the irritant. He found that in the majority of instances, the result of this was the formation of a cone-shaped eminence at the point of irritation, and that this cone remained unaltered for a period varing from three to five seconds, after which time it gradually disappeared. Lately Zabludowsky has experimented directly as regards the action of massage upon the muscles. He has shown that muscles of an uninjured frog, after having been exhausted by a series of maximum blows from an induction coil, regained their power rapidly under massage, whereas rest alone was of little service. Upon rabbits also he showed that the exhausted muscles recuperated much more completely under the influence of massage than after rest alone;

and that, furthermore, in some instances the massaged muscles were able to accomplish more than the non-exhausted muscles which had not been massaged. Also upon human beings he noticed that after exhausting physical work, a short rest (fifteen minutes) did not produce material recuperation, but that after the same period of massage the amount of work could be doubled. Thus, for instance, in one case the person lifted a weight of one kilogram 840 times, at intervals of one second. The weight was placed upon a table, the forearm also resting horizontally upon it. The weight was each time lifted to the shoulder by flection of the elbow. After this amount of work the subject was unable with the utmost exertion to accomplish any more. The arm was then massaged for five minutes, after which he was able, without any exertion, and in the same rhythm, to lift the same weight, in the same manner, 1,100 times. He has also shown experimentally what we have long known practically, that the diseased condition which frequently arises in over-exerted muscles, or in extremely irritable ones, known under the designation of "contracture," can be entirely relieved by massage. In his experiments he produced a tetanus in the muscles of the leg of a rabbit; then allowed them to recuperate by rest, then again irritated until ten minutes' rest was unable to produce any recuperation. Ten minutes' massage on the other hand being substituted for the ten minutes' rest, the muscle was not only restored to its original state, but was enabled to vibrate four to five times as long. That massage also directly increases the nutrition of muscles is a fact which needs very little explanation. It is well known that contraction of a muscle produces heat in that muscle during such contraction, and therefore any increase in the contractility of the muscle will increase the amount of heat produced in it, and thus also increase its nutrition. *Danilewsky* has shown that in addition to this, and independently of the contraction produced, any mechanical shock produces heat in the muscles to which it is applied; the heat production of a muscle is therefore increased in two ways by massage.

Before closing this physiological chapter, a few remarks

on the special action of some forms of massage must be referred to. Particularly the hypnotic action of effleurage merits attention. Effleurage has by many writers been denied the possession of any special qualities, and its chief function asserted to be the habituation of the patient to the hand of the operator, and to prepare him to more easily endure the more energetic rubbings which are to follow. This opinion does not accord with well-known facts. The anæsthetic results, described by observers like v. Mosengeil, *Berghman* and *Helleday* and *Gerst*, obtained after effleurage, prove that it has an action upon the nerve filaments of the skin. But besides this action there is another, and it is upon this that we desire to lay particular stress, that is, its hypnotizing influence. While treating very impressionable patients, hysterical women particularly, it has occasionally happened to us that after a few minutes' effleurage they entered into an hypnotic state. The point that is important is to recognize this action, and to distinctly separate it from any remedial power that massage possesses. Otherwise we may occasionally be led astray by phenomena which are produced in a subject through effleurage, but which could just as easily have been brought about by any other of the well-known modes of producing hypnotism. The following citations from several works on hypnotism show that this fact is acknowledged by investigators in that field. All the more strange, that more notice has not been accorded to it by writers on massage.

Weinhold, A. F. ("Hypnotische Versuche," Chemnitz, 1880) says: "For an intense development of the hypnotic condition, besides continuous fixation, *the irritation of the skin produced by stroking*, and the influence of the imagination, are of great importance." "The action of the irritation of the skin produced by stroking, seems to depend in different persons upon the various manners of stroking. It appears that, in some, the application of pressure which is hardly appreciable; in others, that of a strong pressure, is the most operative; whereas still others seem to be more easily influenced by the exceedingly weak irritation, which is hardly appreciated by a skin of normal sensibility, of the current of

air produced by stroking without actually touching the skin."

Schneider, G. H. ("Die psychologische Ursache der hypnotischen Erscheinungen," Leipzig, 1880): "Stroking of the skin produces continuous muscular contractions, stiffness of the joints, and anæsthesia." Our advice, therefore, briefly is: if you wish to subject massage to reliable tests, beware of histerical subjects.

The action of massage of the neck merits a few words. This form of massage is principally depletory in its action; and that this is an energetic one may be understood when we take into consideration the venous configuration of the parts to which it is applied. It exerts a general derivatory action upon the brain and its membranes, and, therefore, by its use the pressure of blood in the cranium may be lowered in a very short time. In general terms, its action corresponds to that claimed for compression of the carotids, the same results being obtained by another route and for obvious reasons in a more complete and less injurious manner. It may, therefore, be used either as a preparatory remedy to the use of other depletories, or, as can be clinically shown, its energetic action may be made use of in many conditions dependent upon an increased flow of blood to the brain, or an intercepted reflux producing stasis.

RACE AND INSANITY.[1]

By JAS. G. KIERNAN, M.D.,

MEDICAL SUPERINTENDENT, COOK COUNTY HOSPITAL FOR THE INSANE, DUNNING, ILL.

I.—THE NEGRO RACE.

OF all the races inhabiting the United States the present one bears the most peculiar relations to the civilization pervading the country, and hence most deserves special study. Its members were transported under the most unfavorable circumstances from the depths of the lowest barbarism to the height of civilization, but were brought in contact with this in a way most likely to furnish but a caricature of civilization, since it was tinged with the inconsistent way in which the benefits of civilization were bestowed. They were forced to adopt one code of ethics theoretically, while another was taught, or rather forced on them practically. The normal psychological condition of the negro was one resembling that of many Aryan and Shemitic insane,—a condition of unstable mental equilibrium. When to this condition was added the contrast between the code of ethics theoretically taught and the code of ethics practically enforced by the social conditions in which the negro found himself placed, the instability of mental equilibrium must have been increased, and to the instability thus engendered is evidently due the undeniable increase of crime, pauperism, and insanity among negroes *since* the war.

The number of negro insane coming under my observa-

[1] A Series of Studies in Ethnological Psychiatry.

tion in the Cook County Hospital for the Insane was 28 out of 921 insane. The negro population of Cook County is about 6,000 out of 625,000,[1] or a little less than one per cent. The negro race, therefore, furnishes three times its proportion of insane. It must be remembered that in Cook County the agencies which most produce insanity are in active operation, and the negro is treated as an equal in commerce and politics. The direct influence of the social stress to which the negro is exposed is best illustrated by the types of insanity found among the negroes in Cook County:

Form of insanity.	Male.	Female.	Total.
Epileptic	3	9	12
Periodical	1	1	2
Chronic Hysterical		1	1
Hebephrenia	1		1
Paranoia	3	2	5
Paretic Dementia	5		5
Rheumatic	1	1	2
	14	14	28

The types of insanity are not quite equally divided among the two sexes. Epileptic insanity appears to predominate among the female negroes. Hebephrenia is not as frequent among the negroes as one might expect from the relative frequency of the other psychoses of degeneracy. Paretic dementia is more frequent among the negroes of Cook County than among those in New York. According to statistics cited by Spitzka, out of 204 *male* negro insane in New York but 18 were paretic dements. That there should be such a disproportion between New York and Chicago in this respect was to be expected. The negro is expected to combat with the white in the struggle for existence much more in Chicago than in New York. He has imbibed the speculative spirit of the former city, to the lack of which his race owed its relative immunity from paretic dementia.

(*To be continued.*)

[1] School Census of 1884.

THE PATHOLOGICAL ANATOMY OF ACUTE LOCOMOTOR ATAXIA.[1]

By Dr. L. PUTZEL.

THE following is a brief history of the case which forms the basis of my remarks this evening:

J. D., æt thirty-five years, a salesman, married; entered Randall's Island Hospital on September 4, 1883. The family history is unimportant. The patient has had gonorrhœa four times; gives no evidence of syphilis; habits regular, but he used to drink hard on holidays.

The present illness has lasted nine months; it began with ptosis of the right eye, the patient seeing double; shortly afterward he began to have shooting pains in the legs and arms. The pains were worse at night and before a storm. In a few weeks he had to quit work on account of the pains and weakness in lower limbs. Failure of appetite. About five months ago the patient got so weak that he was unable to walk, and had trouble in holding his water.

Present condition (Oct. 4, 1883). Patient walks with assistance, but has a characteristic heel gait, and must watch the motions of his feet; he reels to and fro, when standing with eyes closed.

Anæsthesia and analgesia are present below Scarpa's triangle in both thighs and legs; the patellar reflexes are absent. Slight inco-ordination of upper limbs and some numbness of the fingers. Partial ptosis of right eye; both pupils very much dilated and react poorly to light; optic papillæ normal; special senses normal.

The dynamometer is forced to 40 by the right hand, to 36 by the left hand.

October 24th.—Had a pulmonary hemorrhage; dulness and a few moist râles over upper lobe of left lung.

The power of the lower limbs improved, but the inco-ordination rapidly grew worse, the limbs jerking in all directions upon at-

[1] Read before the Section on Neurology of the N. Y. Academy of Medicine May 8, 1885.

tempting any voluntary movements. There is very marked emaciation of all the limbs, but the muscular power appears to be normal compared with the amount of muscular tissue retained. The ptosis disappeared almost entirely ; eyesight remained normal. The phthisis kept on advancing, and patient died January 7, 1885, without the development of any fresh symptoms on the part of the nervous system. The gross muscular power of the limbs remained good until within a short time of death.

The post-mortem examination revealed exquisite sclerosis of the posterior columns throughout their entire extent, and what seemed to me to be a multiple sclerosis in various other parts of the cord. The gray matter appeared entirely normal.

Microscopic examination shows exquisite sclerosis of the posterior columns (enormous increase of the neuroglia and of nuclei), together with a general increase of the connective elements in the remaining portions of the cord, with the exception of the gray matter, which seems to be perfectly normal. In addition, the blood-vessels of the posterior columns are very much dilated, and their walls are exceedingly thickened, particularly the adventitia, in which the nuclei are enormously increased. In the anterior portions of the posterior columns, particularly in the vicinity of the posterior commissure, the nerve elements proper are very well preserved, despite the great proliferation of the neuroglia. The changes are also less marked in the posterior root zones. In addition, a number of intact nerve fibres can be seen in the more posterior portions of the posterior columns, and even very close to the pia mater. Under a high power these appear in no wise different from the fibres in other portions of the cord. The nuclei around the central canal are increased in number, and there seems to be, also, an increase of fibrous tissue in this locality. Here and there in the other columns of the cord are seen blood-vessels which also present a considerable increase of nuclei.

If we take into consideration both the histological appearances and the clinical history of this case (the rapid loss of power and the acute onset of the ataxia, with the subsequent restoration of power to the normal), I think we are justified in concluding that the disease was primarily a dif-

fuse myelitis, and that this inflammation cleared up in great measure in all other parts of the cord except the posterior columns. In these it continued to advance, and thus gave rise to the typical symptoms of locomotor ataxia.

According to the current theory of ataxia, the disease is primarily a degeneration of the axis-cylinders of the posterior columns, the increase of the neuroglia being regarded as secondary. For the majority of cases this theory, in my opinion, is well founded, and it is unnecessary for me to present the arguments usually advanced to support this view.

But during the last five or six years I have observed clinically quite a number of cases in which this theory did not appear to me to explain the clinical symptoms. These cases were all marked by their rapid onset and by the fact that, as in this case also, loss of power was a prominent initial factor—this symptom only clearing up as the ataxic symptoms became more prominent. The subsequent history presented no peculiarities.

I may here mention that I have under observation at the present time a case which seems to me to be similar in character to those referred to, but differs from them in the situation of the lesion. In this case, the primary symptoms for a long time were those of primary lateral sclerosis (rigidity of the limbs, greatly increased tendon reflexes, stiff gait), but after the lapse of a year or more, the symptoms of multiple spinal sclerosis have been super-added.

Very little attention has been paid by writers to the variety of ataxia under consideration, In fact I do not, at the present time, remember a single writer except Vulpian who has discussed the subject, though I must confess that, on account of lack of time, I have been unable to make a careful study of the literature of the question.

Vulpian merely mentions, in a few cursory remarks, that ataxia is sometimes secondary to other diseases of the cord, viz.: Pott's disease or compression of the cord from other causes, chronic spinal meningitis, meningo-myelitis, chronic pachymeningitis, descending secondary lateral leucomyelitis, etc.

The subject seems to me to be an important one since, if we may indulge in *a priori* reasoning, this variety of ataxia is the only one which offers any hope of therapeutic relief. I must confess, however, that in my own experience thus far this hope has proved fruitless.

Clinical Cases.

A CASE OF MYXŒDEMA IN THE MALE.

By ALLAN McLANE HAMILTON, M.D.

Upon the 16th of April of the present year I was requested by Drs. J. S. Crane and Petit, of Elizabeth, N. J., to see with them Mr. S., an Italian, forty-eight years of age. Mr. S. was born in a small Italian town between Milan and Turin, and has been in this country many years. He is a well-educated man, and the editor of a daily journal. So far as I can learn, he has been engaged in no injurious occupation, and his habits have been remarkably good. He has never had syphilis, nor any disease of moment except a "gastric fever" some years ago. His family history is decidedly neurotic. His father died of cerebral apoplexy, a paternal uncle and sister were insane, and there is a vague account of other trouble.

About eight months ago (August, 1884), while working with a lawn mower in his little garden, he caught cold, as he supposed, and the same evening suffered from pains of an intense character, which first involved his left shoulder, and afterwards his right arm. So intense was their character that large hypodermic injections of morphia were required for his relief. The pains have been paroxysmal in character since that time, subsiding for a few months and returning the last time about one month ago. Besides the arms, they affect the right side of the face, and the gums and lips, and the right half of the tongue. In some respects they resemble neuralgia. A peculiarity of their appearance is that there is a certain periodicity—an afternoon exacerbation—which lasts several hours. He has for some time suffered from migraine and paroxysms of cardiac distress somewhat resembling angina pectoris, and this was a feature of the cases of myxœdema reported by Hopkins, Morvan, and Ballet, and of female case reported by me in 1882. After the first weeks of pain, both hands became swollen, and then both legs, and finally the face, but the swelling seemed to bear no relation to the district of sensory trouble.

He has been able to go about with great difficulty, and upon the occasion of my first visit was in bed. I was impressed at first sight by certain cutaneous and hairy changes which were very striking. His face was swollen, and of a peculiar pasty-white color; his lips were thick and blanched, and his eyes were dull and lustreless. His hair and beard, which had become silvery white several years ago, presented a curious appearance, for within the past two or three months streaks of coarse new black hair have sprouted out in distinct masses, in great contrast with the white. This was found to be the case in his beard, and on top of his head, which had been bald for some time, but is now covered by a new growth.

His tongue was thick and indented at the edges, and was used with some, though not great, awkwardness.

Either labio-nasal fold was found to be hard and dense, and there is a well-marked tissue thickening, and in various spots about the eyes and at the side of the face a scleroderma had taken place. The thyroid could not be felt. Both hands were enormously swollen, and all the joints were enlarged and the seat of a hard, non-resilient swelling. So great was this, that he could not flex his fingers except to a very limited degree. There was no pain either upon pressure or movement. The left hand was much the weaker of the two. The ends of all the fingers were broad and clubbed, and the nails horny and brittle.

Both legs and thighs were affected, those of the left side being the weakest, and the movements of flexion and extension were of the feeblest description. Both feet were swollen, and though in places pitting which did not resemble that of albuminuria was obtained, there were hard territories which resisted the impress of the finger. The skin not only of the legs but elsewhere was of a dead white color, and it was impossible to produce redness even by violent slapping or friction. The cutaneous surface of the legs was exquisitely hyper-æsthetic. Deep pressure was poorly distinguished. There was general and prompt cutis anserina. For two or three months he has not perspired, and it has been impossible to stimulate the sweat glands, and his surface is dry and shining.

Certain curious skin changes have marked the progress of the disease. Over the lower part of the abdomen is a large area of bronzing, with crescentic patches of blanched skin having sharply defined edges. The supra-pubic hair is black, and in places it has disappeared in limited spots. His chest and arms, since the commencement of the disease, have been covered with dense growths of black hair, and resemble in these places the body of an animal.

His mind has undergone a decided weakening, and he is petulant, irritable, and very despondent. So far he has been able to do a great deal of literary work upon the newspaper of which he is the editor, he has had no delusions nor hallucinations, and his memory is fair.

Digestion is impaired, and like other patients he is troubled by

flatus, sour eructations, and epigastric uneasiness. His appetite is capricious, and his stomach does not tolerate many drugs.

No valvular trouble exists, though the vascular tension is greatly increased. Pulse averages 80. The deep temperature upon the right side is slightly higher than on the left, though the surface temperature which has been repeatedly taken is sometimes as much as one or two degrees higher upon the left side and *always higher* than the right. There is no loss of the senses of smell or taste. His tendinous reflexes are all absent, but his skin reflexes are, if any thing, exaggerated.

Repeated and careful examination of his urine by Dr. Crane revealed no evidence of renal disease whatever, and there is no significant alteration in quantity. The symptom so constantly observed by those who have reported cases, namely, the increase of the secretion of saliva, is present here. The patient's mouth is often filled with a tenacious, jelly-like saliva, which he is obliged sometimes to remove with his finger.

His speech is slow and has been for two months or more, and is somewhat ataxic, but he can with deliberation pronounce quite distinctly. His hearing, so far, has not suffered to any great degree.

His eyesight is not good, though there is no history of scotoma, which certain authors have mentioned. Examination of the fundus revealed no change except greater pigmentation, and he had no paralysis of the ocular muscles. His color-sense is good.

He is very susceptible to the influence of heat and cold, especially the latter. He complains of subjective coldness, tires easily, and seems to have lost strength to a marked degree. The treatment has consisted of opium for his pain and nitro-glycerine in doses of $\frac{1}{50}$ of a grain thrice daily.

I saw him a second time on May 8, 1885, and found a most curious change had taken place, the beard having become almost uniformly dark. His abdominal staining had increased, but his face was not so swollen as on the previous visit. For a week or so the function of the sweat glands had been restored, and at night he had profuse sweating. A curious condition of affairs existed—when any joint was flexed, or when the hand was held beneath the tendo Achilles and the foot moved, a distinct and peculiar crepitus was detected.

So far as I know this is the first male case of this rare disease that has been reported in this country, and I only know of five or six American female cases. The only Continental male cases are those reported by Rösch, Bourneville, Ollier, and Morvan.

Some possible interest is attached to the history from the fact that the patient was born in a part of Italy where cretenoid idiocy and pellagra are not uncommon, and the relation of these two conditions with that under consideration has been hinted at by Gull, Duckworth, and certain French authors. So far as I know there is no other cause which could account for its origin.

Society Reports.

NEW YORK NEUROLOGICAL SOCIETY.

Stated Meeting, April 7, 1885.

W. J. MORTON, M.D., President, in the chair.

Dr. A. D. ROCKWELL read a paper on "The Treatment of Exophthalmic Goitre." He had had experience in the treatment of fifteen cases of this disease, of which four had been reported in the *New York Medical Record*, vol. xvi., No. 14; six in vol. xviii. of the same journal, and one in the *New York Medical Journal* for June, 1881. Under the use of the galvanic current, mainly, six of these cases were either completely or approximately cured, two decidedly improved, one slightly benefited, while in two cases no results followed the most varied and persistent methods of treatment. The four remaining cases had never been reported. Other cases had been seen and treated by the author of the paper, but not with sufficient persistency to render them of statistical value. Dr. Rockwell considered that the prognosis in this condition was far more favorable than it was generally considered, and for this reason, and because the tendency was to reserve for final trial the form of treatment that is of primary importance, he was tempted to again call attention to the subject. Efforts in the management of these cases should be of a threefold nature: 1. Attention to diet and hygiene. 2. Internal medication. 3. Electricity. In some cases he had found that the most rigid and conscientious observance of certain fixed rules in

regard to eating and drinking, and the avoidance not only of *excess* in every department of mental and physical hygiene, but the repression of ordinary and legitimate emotions and passions, became absolutely essential. A bland, milk diet was to be generally recommended. Of all forms of internal medication that had been suggested, there were none that Dr. Rockwell's experience so entirely approved as the formula including iron, zinc, digitalis, and ergot. The therapeutical measure, however, which stands prominent, and to which all other forms of treatment must, as a rule, be but supplementary, is the constant current of electricity.

One of the most satisfactory cases of which he had knowledge occurred in the person of a young lady aged twenty, referred to him by Dr. A. R. Carman and Dr. Van Santvoord. The eyes were unusually prominent, the goitre large, and the pulse from 140 to 160. The patient was weak, unable to take but little exercise, and the symptoms were in every way of a most aggravated character. The patient was treated from June 11, 1882, to March 29, 1883, a period of nearly ten months, and received in all sixty-nine applications of electricity. The result was a complete dissipation of every symptom, with the exception of a slight prominence of the eyes, which the parents thought might be congenital. Upon examining the case with her physician a short time since, Dr. Rockwell found no trace of the disease. If his results had been more satisfactory than those generally obtained, he would ascribe it to persistency and method. Another of the four remaining cases was sent to him by the late Dr. Sims. The three cardinal symptoms were present to a noticeable degree, the gland being enlarged to about the size of a hen's egg, and similar in shape. The pulse averaged only about 105, although under excitement it went up to 135. Under treatment with the occasional introduction of a needle, the pulse was reduced to the uniform frequency of 80, and the measurement around the neck over the tumor reduced from fifteen to fourteen inches. In a case sent by Dr. J. Chauveau, the benefit obtained, although decided, was much less satisfactory than in the two preceding cases; the pulse has been lowered

some fifteen beats, and the goitre very much decreased, but symptoms of an asthmatic character have developed, complicating the case, and rendering the improvement less marked. The fifteenth and last case occurred in the person of a lady aged thirty-seven, and followed childbirth. When first seen by Dr. Rockwell, the measurement around the neck was fourteen and three-fourths inches, the eyes slightly but distinctly protuberant, and an average pulse of 115. The health of the patient was exceedingly poor in many ways. This patient received fifty-two applications, with results almost equal to those obtained in the case first mentioned. Dr. Rockwell's method of treatment in Basedow's disease is to first place the cathode over the cilio-spinal centre, and the anode in the auriculo-maxillary fossa, gradually drawing the latter, after a few moments of stabile application, along the inner border of the sterno-cleido-mastoid muscle until the sternum is reached. The second step in the operation consists in placing the cathode over the goitre and the anode in the region of the solar plexus. Variations in the method can be adopted according to the exigencies of individual cases and the experience of the physician. In one case which resisted the usual method of application, immediate and permanent improvement followed the use of currents that were increased and decreased with exceeding rapidity by means of a rheostat.

Summary of results.—Of the fifteen cases that were persistently and steadily treated by Dr. Rockwell, electricity being the main reliance, nine were either completely or approximately cured, three decidedly improved, one only slightly benefited, while in two cases no appreciable result followed persistent effort.

Dr. SEGUIN asked why Dr. Rockwell placed the electrodes as described by him.

Dr. ROCKWELL replied that he placed the negative pole over the goitre because it was generally admitted that any absorptive processes were more energetically performed at the cathode than the anode. Still he did not wish to lay any special stress on this point. The main factor contributing to successful treatment was persistence on the part both of patient and physician.

Dr. SEGUIN had seen a few cases of Basedow's disease, mostly, however, in consultation. The method advised by him was the same as Dr. Rockwell's. But his results had been much less satisfactory, and in no case did he remember a perfect cure.

In cases of rapid pulse, associated or not with exophthalmos, he had for the past five years employed aconitia with very gratifying results. A progressive, and at length permanent, diminution of the pulse-rate had followed the exhibition of the drug.

One woman, aged fifty-five, who had come to him with a pulse of 160 and slight exophthalmos, had her pulse reduced to 85, after six or eight months' treatment. The subjective sensation of internal heat, and tremors, had at the same time disappeared. He generally gave the drug to the amount of $\frac{1}{100}$ of a grain for the twenty-four hours. The directions being to dissolve this quantity in a tumblerful of water, and take a mouthful of the solution for each dose. After one week the amount was increased to $\frac{1}{50}$ of a grain, taken in the same way. In one case he had given as much as $\frac{3}{100}$ of a grain in the same manner. He had also used the fluid extract in two-drop doses.

Dr. WEBBER related the case of a woman, fifty years of age at the time of her menopause, who had come under observation with slight exophthalmos and a pulse-rate of 146–160. There were subjective sensations of heat, but no measurable rise of temperature. In a comparatively short time this patient lost about twenty pounds in weight. But at the end of a year all these symptoms disappeared, and during the past four years had not returned.

Dr. DANA believed that there were irregular types of Basedow's disease, and that in many galvanic treatment produced no marked results. Persistent bed-rest would then act better. He thought the purely neurotic type of the disease was always very difficult to relieve. But there was a second variety that might be called accidental or symptomatic goitre, and which might perhaps be a self-limited affection. It was to be remembered that such simple measures as a milk diet had been reported to have resulted in a cure of the disease.

Stated Meeting, May 5, 1885.

The following officers were elected for the ensuing year: W. R. Birdsall, M.D., President; L. Weber, M.D., First Vice-President; C. L. Dana, M.D., Second Vice-President; G. W. Jacoby, M.D., Recording Secretary; W. M. Leszynsky, M.D., Corresponding Secretary; E. C. Harwood, M.D., Treasurer; E. C. Seguin, M.D., T. A. McBride, M.D., E. C. Wendt, M.D., A. D. Rockwell, M.D., B. Sachs, M.D., Councillors.

PHILADELPHIA NEUROLOGICAL SOCIETY.

Stated Meeting, December 22, 1884.

Vice-President, Dr. CHAS. K. MILLS, in the chair.[1]

Dr. MILLS read a paper on "The Treatment of Epilepsy," of which the following is an abstract:

His remarks applied chiefly to the medicinal treatment of epilepsy proper—grand mal and petit mal. He did not intend to refer to the treatment of convulsive seizures due to tumors, meningitis, spinal diseases, etc.

As to the curability of epilepsy, some apparently authentic cases of cure were on record. After looking over the subject, he could only recall seven cases of apparent or real cure in his own practice, private and hospital. In all of these the attacks remained away for from more than one to more than three years. Gowers mentions a number of cures, at least cases in which seizures had not recurred for as much as four, five, six, or seven years. Several of these cases were children. Three of the seven cases alluded to by Dr. Mills were children. All observations as to the cure of epilepsy were necessarily imperfect. After a number of years the attacks recur again. Although, however, the absolute curability of epilepsy might be doubtful, certainly great benefit from treatment is to be derived in most cases. It is a wrong to such patients not to treat them.

He had used the following remedies, singly, three or four times daily, in a series of cases, during the last ten years: Bromide of potassium, grs. x to ʒj; bromide of sodium, grs. x to ʒj; bromide of ammonium, grs. x to ʒss; mono-

[1] The report of this meeting should have appeared in our last number.

bromide of camphor, grs. iij to vj; hydrobromic acid, f ʒ ss to f ℥ ss; iodide of potassium, grs. v to ʒ ss; biborate of sodium, grs. xv to xx; chloral hydrate, grs. x to xv; oxide of zinc and valerianate of zinc, grs. iij to x; nitrate of silver, gr. ¼ to gr. ½; tincture of belladonna, ♏x to xv, or extract of belladonna, gr. ¼ to gr. ½; extract of cannabis indica, gr. ⅛ to gr. ¼; fluid extract of cocculus indicus, ♏j to iij, or tincture of cocculus indicus, ♏v to x; nitrate of potassium, grs. v to viij. Other remedies which he had only used in combination with some of the above drugs, were as follows: Conium juice, f ʒ j, or fluid extract, ♏iij to x; tincture of digitalis, ♏v to x; sulphate of strychnia, gr. $\frac{1}{40}$ to $\frac{1}{30}$; Fowler's solution of arsenic, ♏ij to v; fluid extract of ergot, f ʒ j to f ʒ ij, or extract of ergot (Squibbs), grs. iij to vj; iron, cod-liver oil, and quinine.

The bromides were certainly the best remedies, and the bromide of potassium, in his opinion, stood at the head of the list. The bromide of sodium came next best to the bromide of potassium. He thought the bromides affected the nerve centres directly. The mixed bromides were better, usually, than any one of them used singly.

The bromides could be advantageously combined with other drugs. The combination which he had found, on the whole, the best for long-continued use was: Bromide of potassium, grs. xv; bromide of sodium, grs. xv; solution of the arsenite of potassium (Fowler's solution) ♏ij; conium juice, f ʒ ss, or the fluid extract of conium, ♏iij to v. This was generally made up with syrup of orange and some bitter infusion. Another good combination, mentioned also by Gowers, was the bromide of potassium and tincture of digitalis. It was only especially valuable in cases complicated with weak heart or mitral disease. Monobromide of camphor had no advantage over the bromides. Hydrobromic acid was efficient in very large doses, but so much water had to be given with it that the amount to be swallowed was appalling to the patient. It sometimes irritated the stomach. Borax was not of established value, but helped a few cases temporarily. He found the iodide of potassium, unless especially indicated, had little value when

used alone in the treatment of epilepsy. Chloral hydrate is not of much value when given alone, but with the bromides, in cases uncomplicated with cardiac disease, sometimes makes a useful combination. Trousseau's belladonna had been used without noteworthy success. Cannabis indica was not to be depended upon. He had tried cocculus indicus in six cases at the Philadelphia Hospital. None improved, and four were made worse by its use, one of the four becomming insane while taking the drug. At the request of Drs. Reichert and Hinsdale, he had used the nitrite of potassium in seven cases. Of these only one seemed to be benefited, and some were made worse by its use. When the bromides had to be stopped, the zinc salts or the nitrate of silver were the best substitutes; but they could only be relied on for a short time.

The way to treat epilepsy, in his opinion, was to simply have a plan of treatment, and carry it out over a series of months or years. He would, for instance, first put a patient upon a single bromide—say fifteen grains three times a day—to be increased until a decrease in the number and severity of the paroxysms was produced. He kept him upon this perhaps for a month. He then used the mixed bromides, or some combination of bromides with other drugs, preferably the bromides, arsenic, and conium prescription. He watched the condition of the patient, and, if necessary, put him on cod-liver oil, quinine, or iron. With reference to nitrates, bromates, etc., he said that there was probably some chemical or chemico-physiological reason for inefficiency. The *ites* and *ates* would probably *never* give as good result as the *ides*. Dr. Mills believed with Dr. Pepper (*Med. and Surg. Reporter*, January 12, 1884), that close attention should be paid to every point in the daily life of an epileptic—to diet, rest, and hygiene; but he did not, with his present experience, believe that a genuine case of thoroughly developed epilepsy could be cured, or even greatly benefited, without drugs. Harm, however, might be done by over-use of drugs.

Among the surgical and external means of treatment he had successfully used, were excision of cicatrix, removal of

neuroma, actual cautery, and blistering to the neck or head. He says he did not use counter-irritation to the scalp, but was a strong believer in the actual cautery, used after Brown-Séquard's method, to the nape of the neck.

DISCUSSION.

The discussion was opened by Dr. E. T. REICHERT. He said that the efficacy of the bromides was certainly not due to the bromine, for bromide of potassium is the best of the bromides, and it contains less bromine than any of the others. The amount of bromine in the chief bromides, as given by Gowers, is as follows:

Bromide of ammonium	81 per cent.
Bromide of potassium	67 per cent.
Bromide of sodium	77 per cent.
Bromide of lithium	92 per cent.

All the bromides act alike, but with varying degrees of efficiency. The bromates, nitrites, etc., are not as useful as the bromides. A certain line of similar chemical salts seem to give uniform physiological and therapeutical results.

Dr. GUY HINSDALE said that, in regard to the cases in which Dr. Mills used the nitrite of potassium, some four years ago, one was benefited, some remained the same, while others were apparently made worse by its use.

Dr. WHARTON SINKLER wished to know if any of the members of the Society had used hyoscyamus, and with what results. He said that Althaus, of London, reported cases in which tincture of hyoscyamus had been used successfully, in doses of from one, two, or three drachms. He said that he had reported one case of epilepsy which had been greatly benefited by cannabis indica, after the bromides and other remedies had failed.

Dr. H. M. WETHERILL said that, in his experience, the bromide of potassium was the best remedy. He said he had never tried the tincture of hyoscyamus. He had never seen a case of epilepsy entirely recover.

Dr. F. DERCUM said that his experience was summed up in the statement that he had found the bromides the best.

Dr. MORRIS LEWIS spoke of the cure of a child, three

years old, at the Episcopal Hospital, in which he could obtain no results with the bromide of potassium. The seizures continued, and were worse, if any thing. He then resorted to bromide of ammonium, and with immediate good results.

Dr. J. H. LLOYD said he thought that in cases of epilepsy attention to the digestive functions and to sleep was highly important. He called attention to the observation of Dr. Radcliffe, that epileptics have a tendency to over-eat and to sleep too much. In his own experience he had found that when constipation was present the seizures were likely to be more frequent and severe. Dr. Radcliffe and other English physiologists seemed to prefer comparatively small doses of the bromides long continued. Dr. Lloyd believed the combination of three bromides with the iodide of potassium to be one of the best in the treatment of epilepsy.

Dr. A. J. PARKER said he believed we could not say that the effect of a drug like bromide of potassium, bromide of sodium, etc., was due either to the bromine, or potassium, or the sodium, etc. Each of these salts is an individual drug, each molecule of which has its own form of motion. Bromine is a substance with its own peculiar molecular condition of motion. Potassium, similarly, has its own motion. Bromide of potassium is the resultant of the two motions. Certain members of the same chemical families, as the bromides, iodides, and chlorides, would seem to go together in therapeutical efficacy, due to similarity of their forms of molecular motion. At any time, we may expect, however, to find wide differences, since our chemical equations simply represent an idea of structure, and tell us nothing concerning the form of molecular movement; and therapeutic effects must certainly depend more on the energy and form of motion that upon any other qualities.

Dr. E. T. REICHERT made a few remarks on "The Use of Hydrobromic Acid and the Bromides in Sea-Sickness."

He said, while crossing the ocean, he had the opportunity of studying the effect of hydrobromic acid and some of the bromides in sea-sickness. Hydrobromic acid was effectual, but had to be used in such large doses that, owing to the

dilution with water necessary, the bulk to be taken was excessive. The bromides were therefore, he thought, to be preferred. Bromide of sodium, in large doses, was effectual in one bad case. He believed that all the bromides were good.

Dr. J. M. TAYLOR spoke of "The Use of Nitrite of Potassium in Angina Pectoris."

In an aggravated case of angina pectoris he had obtained very good results with nitrite of potassium. The patient had been suffering for over a year with paroxysms of increasing intensity, until death seemed imminent. After giving the nitrite of potassium for four weeks, the patient recovered. Nitrite of amyl was used sparingly, to control the paroxysms. LEWIS BRINTON, M.D., *Recorder.*

Stated Meeting February 23, 1885.

The President, Dr. S. WEIR MITCHELL, in the chair.

Dr. H. C. WOOD read a paper on "Chorea," and presented a patient with post-paralytic chorea of peculiar character. He also exhibited a dog suffering from chorea, chiefly affecting the hind legs; and gave the results of some physiological experiments which seemed to point to the spinal origin of at least some choreas.

The discussion on Dr. Wood's paper was opened by Dr. CHARLES K. MILLS, who said he did not fully agree with Dr. Wood in regard to the spinal origin of chorea. As to the treatment of such a case as he presented, with movements limited to one limb, he thought that nerve-stretching might give at least temporary relief. He mentioned cases of athetosis which had been operated on in this way, in which the movements remained away for many months. He also mentioned a case of spastic paralysis in which nerve-stretching proved partially successful.

Dr. WHARTON SINKLER said he could not agree with Dr. Wood's spinal theory if he meant to apply it to children.

Dr. A. J. PARKER referred to the researches which Dr. Dercum and he had made some time ago, and which had been presented to the Society. He said that one inference

that might be derived from their experiments was that certain choreic as well as other convulsive movements were not of spinal origin, but were due to disturbance of the equilibrium of the entire nervous system.

Dr. DERCUM made some remarks to the same import.

Dr. CHARLES K. MILLS exhibited the brain and a cast of the skull of James Burke, a delusional monomaniac, who killed several persons; also the brain of L. W. Beach, the uxoricide.

Dr. J. K. MITCHELL read a paper on "A Case of Paralysis, with Hypertrophy of Muscular, Cutaneous, and Alveolar Tissues."

Stated Meeting March 23, 1885.

The President, Dr. S. WEIR MITCHELL, in the chair.

An abstract of the paper by Dr. J. T. ESKRIDGE on "Tumor of the Cerebellum, with Monocular Hemianopia,"[1] which was presented at the January meeting of the Society, and the discussion on which was postponed, was read.

The discussion was opened by Dr. CHARLES K. MILLS, who said that Dr. Hughes Bennett had reported a remarkable case of brain tumor where there was no neuritis, but hysteria was present for many years.

Dr. W. SINKLER spoke of the value of ophthalmoscopic examination in such cases.

Dr. MITCHELL said it was very common to have hysterical symptoms in cases of tumors of the brain.

Dr. LAMBERT OTT said that while in the wards of the Jefferson Hospital, Dr. Eskridge was kind enough to show me this case. When I first saw her she appeared to me as a pale, anæmic, simple-minded, hysterical woman. After his examination, she asked him for permission to go home, and before he could reply she burst into a violent fit of crying, which was not appeased by a most favorable reply. After he had repeated some points of his examination, she again made the request, with the same emotion increased in intensity, and no amount of promising could subdue her until

[1] For a full report of this case, see this JOURNAL and vol., p. 1.

she had exhausted herself. The question of headache in cerebellar disease is of interest to me on account of a case I reported in the *Med. Times*, November 6, 1880, of abscess occupying the entire right side of the cerebellum, where there was absolutely no other symptom except a severe headache, which was confined to the right occipital region, corresponding to the side of the lesion, and during the violent exacerbations the pain became diffused, but the seat of intensity remained over the lesion. In Dr. Eskridge's case, the pain was not so much localized, but was more diffused, and mostly confined to the top and frontal region. In other reported cases where the tumor of the cerebellum was large, the pain in the head was more diffused, whereas small tumors and abscesses of the same region produced more or less localized headache.

The next paper read was entitled "Notes on the Idiot Skull and Brain," by A. W. WILMARTH, M.D., Assistant Superintendent Pennsylvania Training School for Feeble-Minded Children.

While fully conscious that the value of statistics depends on their amplitude, and that the number of cases I have to present to-night is comparatively small, yet the literature on the pathology of idiocy is meagre, and even the few cases I shall endeavor to describe in this paper may be of interest to those who have made a special study of the nervous system and its diseases.

Asymmetry of the skull in idiots has received considerable attention. The characteristic forms accompanying microcephalic and hydrocephalic brains are too well known to require any mention here. Slight deformities, aside from evidence they may furnish of former violence, would hardly seem to be of much importance as affecting the soft and yielding brain beneath.

Asymmetry of the vault, with the exception which I will shortly describe, is not of frequent occurrence among our children.

Among the cases in our institution are a noticeably large number who have behind and before the ear (commonly the right) a considerable depression. In a very few of these cases,

a second depression exists in the opposite temporal region. Unfortunately it is difficult to obtain facts in relation to the birth of these children. In two cases where depressions exist near the right ear and left temple, a reliable history of a difficult forceps delivery has been obtained. Both of these children, who were among the more intelligent groups, were aphasic. We have been led to believe from these, and from other similar cases, that the violent localized pressure of the valuable obstetric forceps on the fœtal head is not always so harmless as it is generally believed to be.

Hypertrophy of the skull has been found in only one case ; the skull in some parts of the section being a full half inch thick.

Our attention has been frequently attracted to peculiarities about the interior of the base of the skull in congenital idiots and imbeciles.

These consist principally of projection of the bony prominences beyond their normal limits, particularly observable in the lesser wing of the sphenoid and the petrous portion of the temporal bone ; less frequently stenosis of the foramen magnum is found. This was seen in three cases, two of which were epileptics.

Deformity of the crista galli is also common, it being more pyramidal in shape, and bent to the right or left. Even more frequently we find encroachment of the middle and posterior clinoid processes on the pituitary fossa, in some cases nearly closing the upper portion of the fossa.

Localized thickening of the membranes with adhesion to the brain is frequently found. In two cases out of fifteen observed, this adhesion was general, and any attempt to separate them brought away portions of the cortex.

Sixteen brains from idiot and imbecile children were deprived of their membranes, where practicable, dissected, drained for one hour, and then carefully weighed.

The average weight was found to be thirty-six and a half ounces. In all but two cases the patient was over fifteen years of age. One brain taken from an idiot boy weighed fifty-one ounces. From its firm consistency we were led to suspect hypertrophy. One child of eleven years had a brain

weighing only twenty-two and three fourths ounces. In another case, a girl of nine years, the brain weighed twenty-five and one fourth ounces. Still another, a young man of twenty-two, had a brain weighing twenty-five and one fourth ounces.

As a rule, in these cases the weight has been directly proportional to the intelligence of the case to which the brain belonged.

The weight of the cerebellum varied from three and a half to six and a quarter ounces, with an average weight of four and three-quarter ounces. In two cases where the weight of this organ was three and a half and three and three-quarter ounces respectively, both cases were mutes and paralyzed.

According to Sharpey and Gray, the relative weight of the cerebellum and cerebrum is 1:8¼ in the male, and 1:8½ in the female. In sixteen cases, of which thirteen were males, the proportional weight was found to be 1:7½ or, counting only such cases as were certainly congenital (ten in number), the ratio was 1:7, making a marked contrast between the relative development of the cerebrum and cerebellum.

Clevenger, in an article on the relation of the position of the fissure of Rolando to intelligence (JOURNAL OF NERVOUS AND MENTAL DISEASE, 1880), lays down this rule: If the superior arc of the hemisphere, along the great longitudinal fissure, be divided into ten equal parts, the distance from the tip of the frontal lobe to the superior extremity of the fissure of Rolando, would represent from six to six and a half of these parts.

In seventeen brains measured by me, these distances were as five and three eighths to ten.

The frontal lobes are often more narrow and pointed, and show a simplicity of convolution development that forms a decided contrast to the normal brain.

Deficient development in this portion of the cerebrum is most evident in the third frontal convolution, where a small operculum tends to leave the anterior convolutions of the island of Reil exposed.

In six out of sixteen brains the island was not completely

covered. In four cases the exposure was evident on both sides; in two cases, on one side only. In four cases it was very slight; in two cases, marked.

The case of C. M., an apathetic idiot and mute, presents points of considerable interest. No motor or sensory disturbance was apparent during life, except defective vision. The exact extent of this infirmity we were never able to ascertain during life, owing to his low grade of intellect.

While it was very evident that sight was not perfect, he could certainly see well enough to find his way around without difficulty, and to distinguish objects and persons.

After death the following portions of the cerebral cortex were found thin, soft, and wrinkled: the posterior horn of the lateral ventricle being much dilated, and the undeveloped portions of brain substance not over one eighth to one fourth of an inch in thickness.

On the left side were involved the posterior portions of the supra-marginal, the angular posterior portion of the superior parietal, and a considerable portion of the second and third temporal, convolutions. On the right side, the second and third occipital, the angular, the posterior part of the supra-marginal and third temporal, convolutions.

The cuneus on either side was very small. In the usual situation of the angular gyrus no normal brain tissue existed; all other portions of the brain below the cortex, supposed to be connected with sight, appeared normal.

In eight out of eighteen brains the cerebrum failed to cover the cerebellum.

Two cases of defective corpus callosum have been found.

I copy the following notes from our post-mortem records:

"L. A., aged nine, mute; can neither walk nor speak; left arm and leg paralyzed; died in an epileptic convulsion.

"The brain, on removal, showed a tendency to flatten out, the hemispheres separating from each other. On pulling them apart, no corpus callosum was found, its place being supplied by a fold of membrane passing from one hemisphere to the other, through which the fluid of the ventricles could be seen. No trace of a septum lucidum or a velum interpositum was found. The anterior pillars of the fornix, instead of joining, passed directly back to the hippocampal region. Anterior and posterior commissures normal. Instead of a middle commissure, the optic thalami were joined together for a space three eighths of an inch in diameter.

"On making a transverse section of the hemisphere, a projecting process, about three eighths of an inch in length, was seen on either side, in the usual situation of the extremity of the corpus callosum. The gray matter of the gyrus fornicatus was continued along the upper surface of the process, over the end, growing thinner on the lower surface, and giving place to the ependyma of the ventricle."

A block of sclerosis in the right central region explained the paralysis in the left side.

A smaller block existed in the right occipital lobe; while from the movements of the child, and his manner of turning his eyes, we were led to suspect left hemianopsia; but of this we have no certain assurance.

Another case was H. F——, aged eleven. A profound mute; unable to walk; of a very low grade of intelligence. Died of chronic meningitis. The corpus callosum in this case consisted of a narrow band, five eighths of an inch in width, and not over one twentieth of an inch in thickness. So slight was the connection, that in using very slight force to separate the hemisphere sufficiently to photograph the parts, it tore apart. Back of this portion the two parts, very thin and having a sharp edge, separated rapidly. The posterior portions were entirely absent. The septum lucidum was absent. Velum interpositum present, but incomplete. The commissures were all present, but very small. The pillars of the fornix were not connected with each other, and followed the same course as in the other brain.

No trace of a pineal gland was found. Development of the corpus callosum must have stopped at an early period of fœtal life.

The heart was small, weighing less than two ounces. The right auriculo-ventricular valve admitted the tip of the little finger only by using force.

The genital organs were peculiar. An enlarged clitoris, fully an inch in length. A vagina divided into two nearly equal parts by a longitudinal membranous partition, terminated by a small uterus, much flattened in its antero-posterior diameter, and not over an inch in length. In the upper part of the uterus was a cavity which communicated by separate passages with the two parts of the vagina. Ovaries and fallopian tube normal.

Three cases, all of them confirmed epileptics, have been found with destructive lesions of the hemispheres.

1. A case of paralysis of the right arm and leg, complete in the arm, less so in the leg, with progressive aphasia, which had become nearly complete at the time of death. With the infirmity mentioned, a decided change in his disposition occurred, the boy becoming excessively irritable, and even violent at times. Two

patches of sclerosis were found; one in the upper third of the ascending frontal convolution, the other at the junction of the middle and upper thirds of the same convolution. The aphasia was probably due to the lower mass of sclerosis, which extended quite deeply into the brain substance, implicating the fibre leading from Broca's convolution. There was no sensory disturbance in this case.

2. In a case dying of apoplexy, a small spot of white softening was found in the superior parietal convolution near the parietal occipital fissure. There was no symptom that indicated its presence during life except an occasional spasm.

3. A case where atrophy and hardening of the left hippocampus major was found. No accurate examination for symptoms was made during life. We are sure there was no paralysis. During the last months of her life here, with the frequent occurrence of violent spasms, her memory failed fast. Piano-playing, of which she was very fond, was gradually given up, not because of inability to use her fingers, but because she could not remember her notes. The same was true of needle-work, in which she had been quite expert. She apparently forgot how to do it. To the last she would button a girl's dress neatly and quickly, from which we infer there could have been no decided loss of tactile sensation.

It is in the arrangement of the convolutions that some of the most interesting features are met. In congenital imbeciles, and particularly in idiots, striking differences are found.

One type of brain, in this class of children, is very simple in its outward configuration. The convolutions are usually coarse, but little convoluted, and comparatively free from secondary folds. The fissures tend to assume a confluent type, and as we pass to lower grades of intellect this tendency increases.

Another variety, found so far among the lowest grades of idiocy, might well be termed an "atypic" variety. The brain previously described as without a corpus callosum, is a marked example of this type. The short description I present can be readily followed by means of these photographs.

In the frontal lobe of the right hemisphere the first frontal convolution is quite regular. Below this, from the centre of the lobe, seven radiating fissures pass in different directions, cutting the tube into a number of radiating convolutions, entirely different from its usual appearance. The short

fissure of Sylvius, about three inches in length, passes upward, turns sharply at nearly a right angle, and passes almost directly backward. Two parallel gyri curve round its posterior extremity. The arrangement of the convolution of the temporal and parietal lobes are so exceedingly irregular and complex, that it is impossible to classify them. In the occipital lobe, on the contrary, the gyri are complete in number and regular in their arrangement.

In the left hemisphere the arrangement of the frontal convolutions is more regular, but the temporal and parietal lobes present the same complicated area of surface folding, bearing but little resemblance to the normal brain.

The tendency of the convolutions to arrange themselves in parallel curves around the posterior extremity of the fissure of Sylvius, is well shown in this brain of F. N., a boy of exceedingly low intellect. The frontal lobes in this brain are proportionately large, the convolutions straight, especially the third frontal; the fissure shallow. In the left temporal lobe they are nearly obliterated from pressure of fluid in the ventricles. The ascending frontal convolution on each side appears to be wanting. On the left side a large bridging convolution crosses the middle of the fissure of Rolando.

A few other points deserve notice. Confluence of fissure, I have already mentioned as a decided feature of idiot brains. Even where confluence is not complete, the tendency of the principal fissures to cut through separating convolutions is very evident; and should I include in the cases below those where confluence is *nearly* complete, the number would be considerably augmented. In these cases confluence is complete, and the examination comprises fifteen brains from children of all grades of imbecility.

The fissure of Sylvius passes into the fissure of Rolando, in one case on both sides, in another on one side only. In two other cases they are connected by deep secondary fissures.

The inter-parietalis has its orgin in the fissure of Sylvius, in four cases on both sides, in five cases on one side only.

The calcarine fissure passes completely across the gyrus

fornicatus; on both sides in two cases, on one side in four cases.

In one case the first occipital convolution sank nearly beneath the surface, the next occipital gyrus projecting over it, forming a partial operculum.

There also seems to be a strong tendency to form annectant gyri in the upper part of the parieto-occipital fissure In no less than six hemispheres of the fifteen brains were these supplementary gyri found more or less complete.

In one case on both sides, in five cases on one side, we find the parieto-occipital fissure cutting through the first occipital convolution into the inter-parietal fissure. A tendency of the transverse occipital fissure to approach the parieto-occipital fissure is very apparent, though in no case do they coincide.

I will close these remarks without further comment. Why the folds of the cerebral cortex, from a lack of the stimulus of healthy growth, should assume the forms we have seen them possess, sometimes reverting to forms resembling those found in other groups of the animal kingdom, again forming a tangled group bearing little resemblance to what we usually find on the brain surface, we can scarcely venture to attempt to say.

While in a few cases lack of development or coarse lesion, which can be recognized by the unaided eye, may readily account for the loss or congenital want of mental power, in more instances grave impairment of brain-power exists without commensurate lesion, and in the microscope, if in any thing, we shall find the means of unravelling the mystery.

The paper was discussed by Drs. CHARLES K. MILLS and A. J. PARKER.

The following cases were shown to the Society by Dr. S. WEIR MITCHELL: "Atrophy of Upper Half of Body with Well-Developed Lower Half."

CASE I was that of a girl, eleven years old, in which her limbs were well developed, while the upper part of the body was atrophied.

"Two Cases of Spinal Disease with Unusual Symptoms."

CASE 2. Patrick M., æt. 50, Irish, married; no specific history; no previous illness; fell while wheeling barrow three years since; no injury to spine. Soon after noticed burning pain in left foot. Two months after, fell again, without warning, while in house. Soon recovered and went home, and to work twenty-four hours after. Worked with difficulty six months; stopped, and has grown gradually worse ever since. Pain, heat, formication in legs. Occasional spasmodic rigidity in legs at night. No loss of sensation. Faradic reactions normal. Ankle clonus; patellar reflex exaggerated. Cremaster, abdominal, epigastric, and scapular reflexes, present. Reflex action on percussion of deltoid, biceps, or triceps tendons, or extensor tendons at wrist. The chin reflex, noticed by Dr. M. J. Lewis, is present. Sensation in legs is peculiar. On the foot and ankle, and part way up the lower leg, a needle prick was felt as a prick, and perfectly distinguished from a touch. The surface was analgesic, but pain was produced on deeper pricking. From the middle of the leg up, the sensation improved gradually to the level of the eighth dorsal vertebra; above this, it was natural. A prick, or a pinch, or sometimes even a touch, produces spasmodic jerk of muscles; if touch on leg, of soleus; on thigh, of quadriceps; great exaggeration of all reflexes. Ankle clonus. Tetany, if blow on patella is repeated; "spinal epilepsy" (Brown-Séquard); epigastric and abdominal reflexes present. A weak faradic current applied to the nerves produced normal contractions in the supplied muscles; contraction by direct application, like normal. Thickening of skin and areolar tissue of leg, somewhat like Mrs. S., but here appears to be atrophy of muscles.

CASE 3. Mary M., 18, U. S., mill-hand; family history good, except that her father died of consumption, The patient has never had any serious illness. About two years since she discovered on the left side a spot which she does not describe as painful, but says that she had a "curious feeling" in it. Soon after, at a party, she wished to dance, but found herself so lame in the left leg as to make dancing impossible. The toe dragged when walking, and the feebleness of the leg increased slowly, spreading from below upward. At the end of a year the right leg began to weaken, first in the thigh, and then gradually downward, until she was unable to move about or stand without assistance. This complete loss of power has now lasted about eight months She is, she says, weak in the back, and has sometimes numbness of the inner side of the forearms and hands. She can assign no cause for the trouble.

Dr. MORRIS J. LEWIS made the following remarks on "The Chin Reflex. A New Clinical Observation":

In the winter of 1882, while examining at the Infirmary for Nervous Diseases connected with the Orthopædic Hospital, Phila., a case of section of the inferior dental nerve, I discovered a new reflex. For report of the case

see *Phila. Med. News*, March 11, 1882. This consists of a sudden elevation of the lower jaw immediately following a blow upon the lower teeth, or chin, and is most easily produced by striking the parts mentioned in a downward direction with a rubber plexor. The mouth of the patient is of necessity open, and the muscles should be relaxed.

Since then I have observed this symptom in two cases of spastic paralysis, one case of congestion of the spinal cord, one of cerebral tumor, probably specific, one of hemiplegia, one of unilateral tumor of doubtful origin, and occasionally in perfectly healthy individuals.

In some of these the reflex was plainly due to a contraction of the temporal muscles, while in others the masseters seemed to be mainly instrumental in causing it. The clinical significance of this symptom is not as yet clear, but I wish to place it upon record, and to direct attention to it, hoping later to be able to report more fully.

Gowers, in his "Diseases of the Spinal Cord," mentions that irritation of the skin in the intrascapular region gives us the highest reflex available; the *chin reflex* is, therefore, of considerable interest, as being, as far as I am aware, *the highest deep reflex yet discovered.*

LEWIS BRINTON, M.D., *Recorder.*

Reviews and Bibliographical Notices.

Text-Book of Medical Jurisprudence and Toxicology.

By JOHN J. REESE, M.D., Prof. of Medical Jurisprudence and Toxicology in the University of Pennsylvania, etc. Philadelphia : P. Blakiston & Co., 1884., pp. 606.

The author's preface constitutes probably as correct a criticism as can be made of the book before us. He says : "This text-book has been written more particularly to meet the wants of students of legal medicine." To avoid the objection of extending the book to a large size, the author has "endeavored to condense in a handy volume all the essentials of the science, and to present the various topics in a simple and familiar style, giving greater prominence of course to those of the greatest practical importance."

The author has certainly attained his object. As a text-book for the general student who wishes to make himself familiar with the elements of medical jurisprudence, the book will be found very valuable, all important facts receiving attention, and the style of writing being clear and entertaining. Unfortunately, however, for the more advanced student, the size of the volume has been kept within its narrow limits by the omission of illustrative cases. In no other branch of medical science are these so valuable as in medico-legal studies, and when a book is written which, of necessity, is unable to incorporate them, very much of its value is naturally lost. The pages of this work, however, are so full of facts and leading statements that we readily acknowledge the necessity for this omission. In the introductory chapter, attention is again called to the conflict of opinion which is frequently met with among so-called "experts," and which does so much towards rendering such testimony ridiculous in the eyes of the public. The following sensible advice is given : "No one should presume to assume the position of an expert witness who has not devoted his special attention to the matter under consideration, and who is, therefore, not really able to enlighten the jury." The incorrectness of the American manner of obtaining expert testimony is also dwelt upon, and the German plan recommended, according to which the expert is not called by the prosecution or defence, and paid by them, but experts are appointed by the state ;

they are state officers, and their entire time must be devoted to this duty. The advantages of this plan are so manifest, and it has received such ample discussion, that it is strange that we still cling to the old and insufficient method. The toxicological part of the work is particularly complete, and very great attention has evidently been bestowed upon it. The chapter on insanity, in contrast to that on toxicology, is very brief and inadequate, but it contains considerable information which will be of service to the beginner. A short chapter on medical malpractice, and one on life insurance, completes the work. Besides being of value to all medical students who wish to master the rudiments of medical jurisprudence, the book can also be recommended to the advanced student who may desire to refresh his memory upon forgotten, fundamental principles. The index is a particularly full one, and greatly enhances the value of the work. G. W. JACOBY.

Topographical Anatomy of the Brain. By J. C. DALTON, M.D., Professor Emeritus of Physiology in the College of Physicians and Surgeons, New York; and President of the College. 3 vols. 4to. Philadelphia: Lea Brothers & Co., 1885.

The methods of studying the brain have suffered many changes. Not content with the knowledge to be obtained from gross anatomical preparations, anatomists took refuge in the microscope and carefully studied the thousands of sections into which the brain had been divided. Some eight or ten years ago, Flechsig published his embryological (developmental) method, which at the time promised startling results. More recently the experimental (atrophy) method has had its praises sung by Gudden, Forel, and v. Monakow.

Prof. Dalton's volumes come to us as a reminder that the oldest, purely anatomical method is still worth pursuing; that its resources are not yet exhausted, and that much may be learned from such sections as are here presented.

The work before us is essentially an atlas and not a text-book. The author evidently started out with the intention of making it both; for, upon the introductory remarks follows a remarkably lucid statement of the configuration of the hemispheres. For some reason unknown to us, he does not treat of other parts of the brain in the same happy manner. The remainder of the text contains nothing more than an explanation of the various plates.

By these plates the book must be judged. Their artistic excellence was secured by the skill of the photographer, Mr. Mason, to whom especial praise is due. We do not remember ever to have seen more faithful representations of the external appearance of the brain than those given on the first three plates of Series *A*, and on the series *B*, of horizontal sections, the gray and the white masses are differentiated with astounding clearness.

In the introduction to these volumes, the author gives a detailed account of the manner in which these sections were prepared. After careful injections of the ventricular cavities with a warm solution of gelatine, the whole mass of the brain was imbedded in

an apparatus so constructed as to allow of a large number of sections being made, all of which sections are of equal dimensions. (For further particulars see p. 7, etc., of book.) From these cuts a certain number were selected for reproduction. The author has shown good judgment in the selection of these views. From each picture some instruction may be got. By far the most interesting sections are those of the second (horizontal) series. Strangely enough horizontal sections of the brain have been studied far less carefully than either longitudinal or vertical cuts. This applies to microscopical investigations as well. In his excellent chapter on the mammalian brain in Striker's "Handbook of Histology," Meynert has given but two or three horizontal sections; Wernicke ("Lehrbuch der Gehirnkrankheiten") gives three horizontal sections through the monkey's brain, and none from man. On the other hand it was a notable feature of Dr. Spitzka's paper[1] on the lemniscus, that he departed from this custom in giving a number of highly instructive horizontal sections.

Each plate in the atlas is explained by an outline drawing on an opposite or neighboring page. These tracings are capital guides to a careful study of each and every plate. In regard to the nomenclature we notice that the author has not departed from ancient usage. We have the various parts of the central organ designated in the good old-fashioned way. The plates are, beyond a doubt, more intelligible to the average reader than if these time-honored designations had been crowded out by odd-sounding, unfamiliar, though possibly more correct, technical terms. Of these diagrammatic explanations one thing may be said, and that is, that they do not in every instance take into account all that the plates show. On plate VII., series *B*, the occipital radiations are brought out with unusual distinctness, yet no reference is made to them in the outline drawing. On plate XII., series *C*, those who are familiar with microscopical sections of the brain will recognize the posterior longitudinal fasciculus and the lemniscus of each side; but they are not alluded to in the accompanying diagram. Prof. Dalton ought to have pointed to these formations with particular pride, for the fact that they are visible on such views as these proves the excellence of the reproductions.

The mysteries of the pons and the medulla oblongata could never have been solved by this (gross) sectional method; and yet those to whom microscopical sections of these divisions o fthe brain are most familiar will enjoy seeing how distinctly their connections, with the cerebellum in particular, are brought out on plates XII. and XIII. of series *B*.

Enough has been said to assure those interested in brain-anatomy, that a study of these plates will prove both instructive and refreshing.

When we shall have added that the press-work is perfect, the paper elegant, and the volumes not too unwieldy in size, we may

[1] *N. Y. Med. Record*, 1884.

well desist from further praise. The teacher of anatomy will find it advantageous to use these plates for purposes of demonstration, but he ought to be privileged to re-arrange the plates to suit himself, so as to be able conveniently to exhibit horizontal and vertical sections side by side. We understand that a very limited edition of this work has been published. We trust that the author and publishers may see fit to issue another and larger edition before long. B. S.

Treatise on Therapeutics. Comprising Materia Medica and Toxicology, with Special Reference to the Application of the Physiological Action of Drugs to Clinical Medicine. By H. C. Wood, M.D., Professor of Materia Medica and Therapeutics in the University of Pennsylvania, etc. Fifth edition, revised and enlarged. Philadelphia : J. B. Lippincott & Co., 1883, pp. 740.

Whether an author is to be envied in having to re-issue a work after scarcely six months' time, may be an open question. Certainly this fact alone is sufficient to show the esteem in which such a book is held ; and when to this fact the author in a very brief preface tells us that he has by this been stimulated to render the volume, as far as lay in his power, worthy of the kind judgment and continued favor of his co-laborers, then we may rest assured that the book before us presents the newest and broadest thoughts and facts in therapeutical science. At this late day a review of the work is entirely superfluous, and that which has been said about the fourth edition will also apply to this one. New and insufficiently tried drugs and reported new actions of old ones have, with Dr. Wood's wonted conservatism, been entirely ignored or only slightly referred to. This, in the eyes of many, will appear a virtue instead of a fault, but even since the appearance of this fifth edition, the action of certain drugs has attracted the attention of the medical world, which, in the next revision of the work, will have to receive attention. In turning over its familiar leaves it becomes noticeable that, particularly in the parts treating of the physiological action of drugs, facts follow facts with such bewildering rapidity that the study of page after page becomes an absolute necessity. It would be invidious to specify any part of the work as better than the rest. The entire work is one which can receive unreserved recommendation to both students and practitioners. G. W. Jacoby.

Zur Einleitung in die Elektrotherapie. By Dr. C. W. Müller. Wiesbaden, 1885. J. F. Bergmann.

The title of this little book is somewhat misleading, but in a way that does great credit to its author. It is not an introduction to electro-therapeutics after the manner of other works with similar titles ; it is a strictly scientific treatise on some of the most intricate problems suggested by the application of electricity to the human body. Dr. Müller is a practising physician at Wiesbaden, who, as the book proves, has not only had a vast experience in

electro-therapeutic matters, but in his practice has aimed at purely scientific methods.

The author is of the opinion that at the present day no good work can be done in electro-therapeutics without the use of an absolute galvanometer. The first part of his treatise is, therefore, taken up with a consideration of the various instruments that have been constructed for this purpose. He has no hesitation in recommending Hirschmann's vertical astatic galvanometer [1] as by far the best instrument of the kind. Three of these galvanometers were carefully compared with one another, and found to be exceedingly accurate.

In the second part of his little book, Dr. Müller sets out to demonstrate the necessity of measuring accurately the current strength employed in the treatment of various forms of diseases. His conclusion is that the strength of current generally employed is far in excess of what is needed or beneficial. His rule is, "weak, short, and frequent" applications. The author's views have met with considerable opposition in Germany, and will perhaps be a surprise to all those who were in the habit of thinking that, as a rule, the greater the current-strength the more pronounced the therapeutic effect. In our own opinion, while we insist that further proof of the correctness of Dr. Müller's views must be forthcoming before they can be finally accepted, we wish to remind the reader, that until very recently the difficulties of estimating the current-strength were very great, and that few electro-therapentists can be as certain of the electric doses they administered as Dr. Müller is of his. The author has already published an answer to his critics in *Mendel's Neurologisches Centralblatt* (1885, Nos. 9 and 10); and in those articles refers to a number of cases in which his method was eminently successful. A case of tic douloureux was cured by his method after two years' treatment! The question arises (and this the author recognizes), Was the improvement due to the treatment? and what would have been the effect in this very case of stronger applications and longer sittings? As we have said, judgment must be deferred on this head.

To return to the book under consideration. The author treats at some length of the necessity of noting the *density* of current,—a point which is too often disregarded. He suggests that in all electrical applications, not only the milliampères but the size of the electrodes also be noted. The expression $\frac{1}{5}$ or $\frac{1}{20}$ would mean that a current of 1 milliampère is applied to the body through an electrode of 5 or 20 sq. c. m. of surface.

There is a good chapter on resistance, and much else of interest that cannot be referred to here.

All interested in the *science* of medical electricity will do well to *study* this little book; those who are interested simply in the *art* of applying electricity may *read* its pages to advantage. B. S.

[1] For a description of this instrument see p. 19 of this volume.

Untersuchungen über den elektrischen Leitungswiderstand des Menschlichen Körpers. Festschrift, etc., Von Prof. FRIEDRICH JOLLY. Strassburg, 1884, Karl J. Trübner. 4to, 42 pages.

Prof. Jolly, like Dr. Müller, attempts to shake some of our electro-medical traditions. Most of us are convinced that the palms of the hands and the soles of the feet offer a greater resistance to a passing current than any other parts of the body. Prof. Jolly claims the reverse to be true. He tested the resistances with the aid of the Wheatstone-bridge method—the only reliable method in work of this kind. The size of the electrodes, the pressure exerted by each, the nature of the epidermis were properly allowed for. The electrodes were of a uniform size, the pressure was always the same, for the electrodes were attached by rubber bands to the parts to be tested, and as regards the nature of the epidermis the author states that the hands of workingmen and of delicate women yielded similar results. The current used was generated by one Siemens' element. The resistances were noted in Siemens' units (1 S. unit = 0.97 ohms). By comparison with accurate physical instruments it was proved that the galvanometers (Edelman's and Hirschmann's) were true.

While the average resistance (in men) of the palm of the hand was 41,300, it was 30,400 on the back of the hand, 42,300 on the cheeks, 92,500 over the temples, 375,000 on the volar surface of the forearm ! But the difference between individuals was equally great. 22,000 and 55,000 are the extremes of a series of resistances offered by the palms of the hands ; and yet in the individual whose hands offered a resistance of 55,000, all other parts of the body offered still greater resistances.

Prof. Jolly holds that these figures do not represent the original difference of resistance between the various parts, but that they simply imply that in certain parts of the body resistance is more quickly overcome than in others.

The author attempts the following explanation of these phenomena : Placing one electrode on the volar surface of each arm, and measuring the resistance, with the skin intact, and then again after removing an area of epidermis on each arm equal to a silver dollar, it is found that the resistance of the two layers of epidermis is 150 times greater than that of the entire area of the body included between the two poles. The reduction of electrical resistance, the author thinks, is due in part to the physiological effect of the current ; to the dilatation of the blood-vessels determining an increased flow of fluid into the inner layers of the epidermis ; and in part to the physical effect of the current passing through porous conductors. The same results are obtained if the increased cutaneous secretion be set up by the administration of pilocarpine or amyl nitrite.

We acknowledge that Prof. Jolly's investigations bear the stamp of careful work, but his conclusions are sufficiently startling to require further substantiation. B. S.

Insanity and Allied Neuroses. By GEO. H. SAVAGE, M.D., M.R.C.P. Philadelphia : H. C. Lea's Son & Co., 1884.

"What I want is facts," is the declaration of M. Grandgrind, a type of the British philistine, and of the Grandgrind type is the author of this book. The author grandiloquently remarks in his preface : "To those who have been engaged for years in the culture of any branch of science, and in the imparting of its data to others, there naturally comes a time when the facts, and the apparent relations between them, seem to demand some permanent registration. One has, as it were, to take stock of one's facts and see what has been learnt. I have for some time felt that my period of observation without registration must terminate, and that I owe it to my position as physician to a large hospital, to give the younger members of my profession the results of my more than twelve years' experience in Bethlem,"—and this is the *raison d' être* of the present work.

In the opening chapter there is shown the same tendency to the sensational which disfigures so many British works. The author states that : "No man is perfectly sane in all his mental faculties any more than he is perfectly healthy in body." The author attempts to avoid by this paradox any criticism on his definitions on sanity and insanity. His demarcation and distinction of eccentricity from insanity is not at all lucid. Isaac Ray, not to speak of others, had clearly pointed out that there were two great types of "eccentric" people. One so clear-minded and well-balanced as to be a law unto society rather than *vice versa*, and the other, whose mental defects were visible in every act ; but of such a distinction Dr. Savage seems totally unaware, and here is to be found one defect of the work as a manual for students. Had Dr. Savage a little less tendency to the mere registration of what he calls fact, and greater power of analysis, he would have perceived the relationship his so-called eccentric bore to the paranoiacs. The dilettantism of the Grandgrind school of alienists comes out strongly in the remarks on genius and crime in relation to insanity, although the author's experience prevents him from being utterly puerile. The classification of the author is modified on, but sadly degenerated from, the ideas of Morel as enunciated by Skae. The author's experience, even veiled as it is in the mass of words forming this chapter, tends to justify the broad principle of classification which is slowly being adopted in this country, and is already dominant in continental European psychiatry, namely : that there are pure psychoses and complicating psychoses, but of this he himself is unconscious. The author leans to the view, unconsciously it would seem, that paretic dementia is a psychical manifestation of a brain disease. The egotism of the author and his estimation of his classification may be judged from the following language : "My division of insanity being provisional, and in no way pretending to be final, will be found more useful than elaborate new plans which would entail labor to the student to master, and which will in the end have to

be thrown aside." Considering that the classification is largely hypothetical and somewhat inconsistent, this language is rather hyperbolic. The author, for whom psychical phenomena must be well demonstrated to be accepted, says: "Perversion of the moral nature may be so great as to justify the use of the term moral insanity." The chapter on causation contains nothing new nor newly put. The remarks on heredity are, however, much more judicial than might have been expected from the philistinish tendencies of the author, and the same might may be said of the remarks on masturbation, alcohol, and religion. In his discussion of acute delirious mania, he confuses the confusional insanities of exhaustion, Bell's disease, and transitory frenzy in one disease. The remarks on the pathology of mania sound strange in the light of American and Continental researches. Under hypochondriasis the author confuses very different conditions. Under melancholia he confuses stuporous insanity, katatonia, phthisical insanity, and many diverse types with persecutional delusions. The author entertains views as to the responsibility of the insane unjustifiable from the standpoint of abstract justice. To the alienist the book is of some value. To the general practitioner and medical student it is a very deceptive guide on account of its plausible simplicity. J. G. KIERNAN.

The Adjudged Cases on Insanity as a Defence to Crime. By JOHN D. LAWSON, St. Louis. T. H. Thomas & Co., 1884.

This work has for motto the following citation from (Cunningham *v.* State, 56 Miss., 269) a judge's charge: "There is perhaps no subject connected with the common law upon which the authorities are more hopelessly in conflict than this." To a work of the kind projected by Mr. Lawson this motto is eminently appropriate, since, as he says, its object is to present in a single volume all the reported cases where insanity has been set up as defence of a criminal charge, and has been passed upon by a court of justice in America or Great Britain, and these cases illustrate very decidedly that the proverb about doctors disagreeing was more applicable to doctors of law than to doctors of medicine.

The first chapter is devoted to tests of insanity, and the legal tests of insanity advanced are as follows: The first test is the child-test enunciated by Lord Hale: "Such a person as, laboring under melancholy distempers, hath yet ordinarily as great understanding as ordinarily a child of fourteen years hath, is such a person as may be guilty of treason or felony." Chief-Justice Tracy a little later enunciated the dictum that: "Such a madman as is to be exempted from punishment . . . must be a man that is totally deprived of his understanding and memory, and doth not know what he is doing no more than an infant, a brute, or a wild beast." The test of knowledge of right or wrong in the abstract was first enunciated by Judge Mansfield on the trial of Bellingham,

an undeniable lunatic, who was thereby convicted and condignly hung. This test was very soon modified into a test of knowledge of right and wrong as applied to the particular case. Of these four legal tests the fourth is only to any extent accepted in the United States, and reigns supreme in Alabama, California, Delaware, Georgia, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Texas. In Illinois, Indiana, and New Hampshire the doctrine is accepted that there can be *no* abstract legal test of insanity. Mr. Lawson makes the astonishing statement that Judge Cox's "learned" charge in the Guiteau case has gone a great way to establishing the rule that delusion to constitute a defence must be objective as distinguished from subjective. It is hardly credible that in making this statement Mr. Lawson has clearly comprehended the meaning of the words used. From a scientific psychiatrical standpoint Mr. Lawson's discussion of delusions is an absurdity, and his ideas denote a belief that legal enactments or decisions can annul scientific facts.

Chapter second is devoted to discussion of the question of the burden of proof of insanity. In Delaware the burden of proof is on the prisoner. In Alabama insanity must be proved beyond a reasonable doubt. In Iowa insanity must be established to the satisfaction of the jury. The same is the case in Kentucky, where a doubt does not justify acquittal. In Maine the same view is held. In Missouri it is not necessary that it be proved beyond a reasonable doubt. In Ohio the jury must be satisfied that the prisoner is insane, and the same is the case in Pennsylvania. In Illinois it suffices to raise a reasonable doubt, and the burden of proof does not lie on the prisoner; the same view is held in Indiana, Kansas, Michigan, Mississippi, New Hampshire, and Nebraska. In New York and Tennessee it has been *at times* held that the burden of proof is on the prosecution. It is obvious that legal dicta are decidedly contradictory.

The third chapter is devoted to drunkenness, and contains the usual contradictory decisions. Chapter four is devoted to kleptomania and somnambulism, and it appears that legal decisions in Texas recognize kleptomania as a type of insanity, from which it logically follows that uncontrollable impulse is legally recognizable. The fifth chapter is devoted to evidence and practice. The sixth chapter is devoted to the discussion of decisions bearing on the question of insanity at trial or after conviction. Taking the work as a whole, it is of decided value to the forensic alienist, more particularly in the English-speaking countries, for in all of these, English common law prevails. The notes of Mr. Lawson are of unequal value, and do not manifest that familiarity with psychiatry which one would expect from a gentleman whose psychological knowledge is of no mean character, and who evidently has a decided penchant for medico-legal topics. The style is, as a rule, excellent. The work is fairly well issued. J. G. K.

Editorial Department.

THE SECTION FOR NERVOUS DISEASES AND PSYCHIATRY OF THE INTERNATIONAL MEDICAL CONGRESS.

SOME of our foreign correspondents have inquired whether the nature of the work to be done in this section had been determined upon or not. We believe that no steps have been taken in this matter as yet. Without wishing to obtrude our advice upon the special committee, we would suggest that the meetings of this section will be of far greater interest if the committee were to consult the preferences of prominent neurologists and alienists, at home and abroad, as to the subjects which most need discussion; not only the subjects themselves, but the order, too, in which they should be taken up, would then be determined by the opinion of the majority. This plan was adopted by some, if not by all, of the sections of the London Congress. Thus we know, that the majority of physiologists decided that the question of cerebral localization should be the first to be discussed.

Some such plan as this must be adopted, for we cannot expect our European *confrères* to come to this country to listen to a number of heterogeneous papers on subjects which may not be of special interest to any but the writers of those papers.

THE following is a list of the officers appointed for the section (12) on Nervous Diseases and Psychiatry:

President, S. Weir Mitchell, M.D., Philadelphia. Vice-Presidents, Charles F. Folsom, M.D., Boston; John P. Gray, M.D., LL.D., Albany, N. Y.; J. S. Jewell, M.D., Chicago. Secretary, Charles K. Mills, M.D., Philadelphia. Council, Roberts Bartholow, M.D., LL.D., Philadelphia; Allan McLane Hamilton, M.D., New York; Walter Hay, M.D., LL.D., Chicago; Francis

T. Miles, M.D., Baltimore ; James J. Putnam, M.D., Boston ; Samuel G. Webber, M.D., Boston ; Horatio C. Wood, M.D., Philadelphia ; John P. Van Bibber, M.D., Baltimore.

A NEW CLINIC FOR MENTAL AND NERVOUS DISEASES

has been established at Halle in Germany, and has been placed under the direction of Prof. Hitzig. For the present but forty patients can be received into these special wards. They need not be formally *committed* to this clinic ; they are received upon the same conditions as in the other wards of the hospital. The advantages of this system are manifest to all. The director is not burdened with the duties of a manager ; patients in the early stages of mental trouble, who would not be sent to an insane asylum, will receive proper treatment, and students will have access to these clinics as they have to all others. We have no doubt that other German universities will soon follow suit. Up to the present time there are, if we mistake not, but three clinics of the kind in Germany and Austria, the other two being Westphal's in Berlin, and Meynert's psychiatrical clinic in Vienna.

Periscope.

a.—ANATOMY OF THE NERVOUS SYSTEM.

EXPERIMENTAL RESEARCHES ON THE CONNECTION OF THE VISUAL AREA AND THE SUBCORTICAL CENTRES AND OPTIC NERVE.—V. Monakow has been investigating the course of the visual tract by the method of Gudden, extirpating from new-born animals various parts of this tract and observing the subsequent atrophy. His results are as follows. The first series of experiments was upon rabbits :

1. If one eyeball be extirpated there follows an atrophy of the optic nerve, and of its continuation through the chiasm, and in the optic tract of the opposite side, the decussation being complete. This atrophy can be traced into the gray masses in which the tract ends, viz., the corp. genic. ext., the pulvinar, and the ant. corp. quadrigem. These gray masses are not atrophied in their entire mass, but certain layers only are affected. In the corp. genic. ext., the white capsule which surrounds the ganglion on its lateral, ventral, and dorsal surface is reduced to a very thin layer ; and the gelatinous substance in the lateral part of the dorsal nucleus is atrophied. The number and appearance of the ganglion cells are not changed. In the pulvinar the similar portions, viz., the capsular fibres and the basis substance, and not the ganglion cells, are the parts which atrophy. In the corp. quadrigem. ant. the atrophy is limited to the first two layers, viz., the surface gray and superficial white layer. In the surface gray the upper zone is reduced by the disappearance of the zonal and ependymal fibres and of the small cells of this layer—the cells which remain however presenting a normal appearance ; the lower zone is reduced by the shrivelling of the polygonal cells which it contains, many of which had lost their processes. In the superficial white layer the axis-cylinders of the fibres had almost wholly disappeared, and this atrophy could be followed into the brachium of the corp. quad. ant. The other layers of the corp. quad. ant. were not affected.

2. If the cortex of the occipital convolutions of one side be extirpated, there follows an atrophy of the tract (known as Gratio-

let's radiation) which joins these convolutions with the corp. genic. ext., the pulvinar, and the ant. corp. quadrigem. This atrophy can be followed through the posterior portion of the posterior half of the internal capsule and into these ganglia. In the corp. genic. ext. the entire ganglionic mass is much reduced in size, the ganglion cells being the part affected. The gelatinous substance is somewhat atrophied and the white capsule is thinner than normal, but these parts are not as much changed as in the first set of cases. In the pulvinar both ganglion cells and basis substance are reduced in number and size, and the zonal fibres are less fully developed than on the sound side. In the corp. quadrigem. ant. the first two layers are not affected to any extent, but a marked atrophy occurs in the deep white layer, and in the brachium corp. quad. ant. The deep gray layer did not appear to be affected, nor were the other layers involved. From these experiments v. Monakow concludes that in the rabbit the visual tract leads from the retina of one side to the occipital convolutions of the opposite side—a tract which is not direct, but is broken by the interposition of the basal ganglia named. The fact that in both experiments the gray network of the gelatinous and basis substance of the ganglia were affected, while in each, separate parts of the ganglia were atrophied, indicates that the two tracts are not independent. The optic fibres end in the gray network of the ganglia, whence impulses reach the cells of the ganglia, which in turn are in direct connection with the cortical cells.

3. If the posterior portion of the internal capsule, through which this visual tract passes, be divided, there follows an atrophy both of the Gratiolet radiation and of the cortex. The cortical atrophy was not, however, uniform, but was limited to the third and fifth layers of the cortex, viz., the layer of large pyramidal cells, and the layer of multipolar ganglion cells. The ependymal layer, the layer of small pyramidal cells, and the layer of spindle cells were not involved in the atrophy. Hence v. Monakow concludes that it is with the third and fifth layers of the cortex that the basal ganglia are directly connected, and that it is in these that visual impulses are perceived.

A second series of experiments has been performed upon kittens. This series shows that in these animals the optic nerves decussate partially, not wholly as in rabbits. The optic tracts end in the white capsule and in the gelatinous substance of the corp. genic. ext., in the basis substance of the pulvinar, and in the upper two layers of the corp. quadrigem. ant. The occipital cortex is in connection wirh the ganglion cells of the corp. genic. ext., the pulvinar, and the deep gray of the corp. quadrigem. ant. Extirpation of various parts of the occipital cortex produces various changes in the ganglia. So that the conclusion is warranted, that the median portion of the visual area of the cortex is connected with the lateral portion of the basal ganglia, and the lateral portion of the cortical area with the median portion of the ganglia. Hence the fibres from these two portions cross one an-

other in the posterior part of the internal capsule. But inasmuch as different parts of these basal ganglia atrophy, when one or the other optic nerve is divided, it follows that the median half of the occipital cortex is connected with the eye of the opposite side, and the lateral portion of the cortex with the eye of the same side. This is the same conclusion which was reached by Munk from his physiological experiments. The corp. quadrigem. ant. appears to have less connection with the optic tract in cats than in rabbits, inasmuch as it is less involved in the secondary atrophy. This is also the case in man.

That these conclusions are true of man as well as of lower animals, v. Monakow is able to prove by means of the examination of pathological cases. In a case of porencephalie both occipital lobes were destroyed in fœtal life by embolism of the post.-central arteries. The infant lived two days. After death large defects of substance were found in both hemispheres, and, as a result, a secondary atrophy occurred in the subcortical centres. The appearance was the same as in the experiments by extirpation of the cortex in cats. Associated with the defective development of the occipital lobes there was a defective development of the corp. gênic. ext., the pulvinar, and, to a less extent, of the corp. quadrig. ant. The optic tracts and nerves were also atrophied to a considerable degree. The fact that in both experimental cases, and in the case of porencephalie, the corp. genic. int., Luys' body, and the corp. quadrigem. post. were not affected, is proof that these ganglia have nothing to do with the visual tract.

In a case of thrombosis and softening of both occipital lobes in patient seventy years old, who lived four years after the onset of the symptoms, a secondary degeneration was found from the atrophied right occipital lobe, through the radiation of Gratiolet into the corp. genic. ext., the pulvinar, and the corp. quadrigem. ant., and thence along the right optic tract to the chiasm and into both optic nerves. The lesion in the left occipital lobe was of more recent date, and had not produced any atrophy. This case supports in all respects the conclusions reached from the examination of the porencephalic brain, and of the animals subjected to Gudden's method of experimentation. It is, therefore, of great value.

The results reached may be summed up as follows : Each eye is connected with both optic tracts, and thus with both corp. genic. ext., with both pulvinars, and to a slight extent with both corp. quadrigem. ant., the connection with the ganglia of the opposite side being more extensive than with those of the same side. The optic tracts end in the gray network and gelatinous substance of these subcortical centres. The ganglion cells of these subcortical centres, into which impulses pass directly from the gray network and gelatinous substance, are in direct connection with the cortex of the occipital lobes ; the median portion of the subcortical centres being joined to the lateral part of the cortical visual area, and their lateral portion being joined to the median part of the cortical area. Thus the median half of each

occipital region receives impulses from the nasal half of the eye of the opposite side, and the lateral half of each occipital region receives impulses from the temporal half of the eye of the same side.

This conclusion is in perfect accord with that of Wernicke and Wilbrand, reached by a study of pathological cases. It confutes finally the scheme of Charcot, and demonstrates that a lesion of one occipital lobe must produce bilateral hemianopsia.—*Arch. für Psychiatrie*, xiv., 698–750 ; and xvi., 151–200.

THE RELATION OF THE GRAY MASSES OF THE NERVOUS SYSTEM TO THE PERIPHERAL ORGANS.—Prof. Alex. Hill has subjected the doctrines of localization to the test afforded by a study of comparative anatomy. In the light of the theory of localization of function, the different regions of the brain are as separable one from another as different organs of the body. This specialization of function must be associated with specialization of structure. If the different regions of the brain have different kinds of work to do, the extent to which they are developed will vary as to the amount of work apportioned to each. One brain receives no sensations of sight, another none of hearing, another none of smell.

If the regions which physiologists regard as the centres of these functions be equally developed, the theory falls. If an obvious distinction in development obtain, it may stand. Any attempt at exact delimitation of areas is impossible, until a method has been invented by which the percentage of superficies of different regions can be obtained in a large number of brains. Accepting this principle, Hill applies it to the ungulate and carnivorous types. Herbivora depend for safety almost entirely upon the eye and upon rapidly repeated, but simple, movements of the limbs. Carnivora depend upon the sense of smell and upon complex co-ordinated movements of the whole body. With great muscularity is associated a large sigmoid gyrus. Animals in whose daily life sensations of smell play a large part present long brains with considerable development of the gyrus hippocampi and of a part of the temporo-sphenoidal lobes. The development of the inner part of the occipital lobes varies with the sense of sight.—*British Medical Journal*, March 14 and 21, 1885.

Prof. Hill seems to be unaware that this line of research has been extensively pursued by Spitzka in this country, and by several German anatomists, the authorities whom he mentions being chiefly English. The subject is one, however, which admits of further research, and it is to be hoped that with the large collection of brains in the Hunterian Museum at his command, the Hunterian professor will obtain and publish more detailed results.

THE MIDDLE PEDUNCLE OF THE CEREBELLUM.—Bechterew finds two systems of fibres passing from the hemisphere of the

cerebellum to the pons, which are distinguished from one another by the fact that they develop in the fœtus at different periods.

1. The cerebral system arises chiefly from the cortex of the posterior lateral and basal parts of the hemisphere, only a few of its fibres coming from the superior parts. It lies in the lateral part of the peduncle, and passes in a diagonal direction from behind forward. It ends in the gray masses of the upper half of the pons, being joined with masses in both lateral portions, the majority of its fibres crossing the median line. From these gray masses new fibres arise, which go upward in the pes of the crus to the cerebrum. Some of these fibres go to the frontal lobes, others to the temporo-occipital lobes, while a few end in the corpora striata.

2. The spinal system arises from the cortex of the superior part of the hemisphere, and in part from the vermiform lobe. It lies beneath the cerebral system in the middle peduncle, and passes diagonally from before backwards, only the most caudad part appearing on the surface of the pons. It ends in the gray masses of both sides of the pons. From these gray masses numerous fibres arise which pass dorsad in the raphé between the lemnisci to the formatio reticularis, where they end by turning laterad into a mass of nerve cells recently discovered by Prof. Flechsig and named by him nucleus reticularis tegmenti pontis. These nuclei lie in the middle third of the pons, between the lemniscus and the posterior longitudinal fasciculus, in the formatio reticularis, on each side of the raphé. The ganglion cells of this nucleus resemble those of the gray masses of the pons, but are larger and are embedded in a thick network of fine fibres. Inasmuch as the formatio reticularis caudad of this nucleus contains many more longitudinal fibres than it does cephalad of the nucleus, and as many of these fibres can be traced (?) into the anterior and antero-lateral columns of the spinal cord, Bechterew considers that the nucleus reticularis has a connection with the cord, and that the system of fibres which terminate in it join the cerebellum with the motor portions of the cord. It is the spinal system of fibres in the middle peduncle which first obtains its medullary sheath—at a time when the pyramidal tracts are the only ones possessing a sheath. He considers this system as a centrifugal tract from the cerebellum to the cord in which co-ordinating impulses may pass to the motor centres. — *Neurolog. Centralbl.*, March 15, 1885.

In advancing this view of the function of the tract, Bechterew seems to overlook the view now generally adopted, that the cerebellum governs co-ordination, not by sending impulses outward to the muscles, but by being the organ in which space relations are received from various sensory organs, and whence they are transmitted to the cerebral centres of motion, in which the true co-ordination takes place.

The Origin of the Spinal Accessory Nerve.—Numerous authorities have described a double origin to the XI. nerve, dis-

tinguishing a spinal portion which arises from a long group of cells in the lateral projection of the anterior cornua, and a medullary portion whose cells are not separable from the cells of the vagus nucleus. Darkschewitsch claims that the nerve arises from a continuous column of cells lying laterad and dorsad from the median group of the anterior cornua and preserving the same relation to the hypoglossal nucleus in the medulla. This column extends from the fifth cervical segment upward to the lower vagus nucleus at the lower third of the olivary body. The accessorius nucleus has therefore no connection with the upper or lower vagus nucleus, nor with the solitary fasciculus, as was claimed by Stieda. The roots of the nerve pass from the nucleus laterad, making a sharp curve in their course to the surface. The concave side of the curve is directed ventrad and laterad.—*Neurolog. Centralbl.*, March 15th.

THE POSTERIOR COMMISSURE OF THE BRAIN.—Spitzka has destroyed the entire left thalamo-crural region in a cat and observed the subsequent atrophy. He describes the following changes: The posterior commissure was reduced to half its normal size. The fibres from the left thalamus to the commissure were absent. The fibres from the commissure to the right half of the tegmentum were absent. There was present on the left side a distinct field under the posterior longitudinal fasciculus, close to the raphé, which was continuous with the posterior commissural fibres. This field was atrophied on the right side. There was an atrophy of the reticular field on the left side, lying between the posterior longitudinal fasciculus and the descending trigeminus root. There was atrophy of the right nucleus of Burdach.

He concludes that the thalamus is connected with the fundamental strand of the anterior column of the oblongata by means of the internal fibres of the reticular field—which cross in the posterior commissure,—and that the thalamus or subthalamic region is connected with the nucleus of Burdach by means of fibres which pass in the middle part of the reticular field, and decussate in the medulla. The first tract Spitzka names the thalamo-tegmental tract. It decussates in the posterior commissure. This experiment confirms the conclusion of Meynert, that each thalamus is connected with both reticular fields of the tegmentum by two great strands, one direct and one crossed.—*Alienist and Neurologist*, April, 1885; *Boston Med. and Surg. Jour.*, April, 1885.

M. ALLEN STARR, M.D., PH.D.

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b.— PHYSIOLOGY OF THE NERVOUS SYSTEM.

A HEAT-CENTRE IN THE CEREBRUM.—Herr Aronsohn and J. Sachs have made a series of experiments upon this subject on rabbits and dogs. The experiments were made upon the brain of rabbits with a needle, and the rectal temperature noted. After

the lesion the temperature increased to 42 C. ; the respiration was increased, also the frequency of the pulse, with diminution of the chloride in the urine. The state of the rabbit during the experiment, and many weeks after it, was excellent ; there was no disturbance of the motor, sensory, or digestive apparatuses The point where the needle entered was somewhat to the side of the place of junction of the sagittal and coronal sutures, and then it was pushed to the base of the brain and withdrawn. The increase of temperature lasts two to three days, and then returns to normal.—*Deutsche medicinische Wochenschrift.* No. 51, 1884.

[NOTE.—The location of this centre has been pointed out by the translator in a previous number of this JOURNAL: "The influence of the diabetic puncture upon the temperature of the body, and especially the liver-temperature."]

Herr Aronsohn has made a series of experiments upon this point. Observations at the bedside have shown diabetics to have a subnormal temperature. His experiments were made upon rabbits ; his results were as follows : When the sugar-puncture is correctly made without injury to the neighboring parts, the temperature of the liver sinks, as it also does in the muscles and rectum. By injury to the adjacent parts the temperature in the beginning falls, but returns to the original temperature. If the sugar-puncture fails, or by simple injury of the medulla, or pons or the lateral parts of the medulla, the temperature increases without a preliminary fall about 1.5° above normal.—*Deutsche medicinische Wochenschrift*, No. 46, 1884.

THE VASO-DILATORS AND VASO-CONSTRICTORS.—Drs. von Anrep and Cybulski have made a series of experiments upon this point. They used the plethysmograph, and found that atropia did not cause any paralysis or weakening of the irritability of the nervi erigentes. They arrived at the following conclusions : There is no analogy between the vaso-constrictors and vagi in their relation to atropia. There is no analogy between the vaso-constrictors and the accelerators of the heart, since the strongest irritation of them is not able to overcome the effect of a very weak irritation of the vagus, whilst irritation of the vaso-constrictors with weak or strong currents removes the effect of the irritation of the vaso-dilators. A definite height of blood-pressure is an indispensable condition for the appearance of a marked dilatation of the vessels. There is no important difference between these two kinds of vaso-motor nerves. The facts contradict the view of two complete independent neuro-muscular apparatuses in the vascular walls.—*Centralblatt für Nervenheilkunde*, von Dr. Erlenmeyer, No. 24, 1884.

THE LIVER-FERMENT.—Miss Florence Eves has made a series of experiments upon this subject, and arrived at the following con-

clusions : Since an amylolytic ferment can be obtained from the blood, and since the blood-vessels of the livers used had not been washed out before the livers were placed in alcohol, it is only fair to suppose that a portion at least of the ferment obtained in each case really came from the blood and not from the substance of the hepatic cells. There is evidence of the existence of an amylolytic ferment in the liver which may be extracted in the way described, but the amount is very small. This is the more striking when it is remembered that the liver used in each case had, in order to get rid of glycogen, been kept till the glycogen had disappeared—that is, until such time that it might be expected there would be the maximum amount of ferment present.

The sugar formed *post mortem* in the liver is certainly, as known from the experiments of Seegen and Külz, true dextrose, and this was confirmed by an examination of the alcoholic washings of the livers used in this research. The sugar formed by the action of the liver ferment when isolated is, at all events in the case of starch, and very probably in the case of glycogen also, not dextrose, but some sugar with a much smaller reducing power. It may be maltose, but is certainly not dextrose, which is the really important point. This investigation seems to fully bear out the suggestion expressed at the outset, that the *post-mortem* conversion of sugar in the liver is not to be attributed to a ferment action. Since the sugar formed *post mortem* is true dextrose, and that which can be obtained by the action of the amylolytic ferment which can be extracted from the liver is not dextrose, then either the liver must contain a ferment which differs entirely from the amylolytic ferments of the body with which we are at present acquainted, or else the *post-mortem* production of sugar in the liver is not due to amylolytic ferment action at all.—*Journal of Physiology*, vol. v., Nos. 4, 5, 6.

THE SPINAL REFLEXES.—Helmholtz found the reflex-time ten to twelve times greater than the time required for the conduction in peripheral nerves of about the same length. Prof. Rosenthal has studied this subject, and discovered that the reflex-time (that is, the time elapsing between the moment of sensory irritation till the beginning of muscular contraction), changes in an extraordinary manner, according to the strength of the irritation and the place of it. By direct irritation of a motor nerve, with minimal to strong currents, then within certain limits the extent of the muscular contraction increases, as is well known, with the strength of the current. It is otherwise with the reflexes. He also discovered the remarkable fact, that by irritation of a sensory nerve coming from the lumbar cord, the effect was conveyed to the motor nerves in the upper part of the cervical cord and not to those arising from the lumbar segment.—*Centralblatt für die medicinischen Wissenschaften*, 1885, No. 5.

THE VELOCITY OF ACCOMMODATION.—Dr. Banet has made a series of experiments upon this point and arrived at the following conclusions: The accommodation-apparatus acts with varying degrees of rapidity according to different circumstances, the principal of which are age, lesions of refraction, practice (?), individual characteristics, time of day, and fatigue. Relaxation occurs with very much greater rapidity than active accommodation. That with two eyes of much the same refractive character the accommodation velocity of either, measured separately, is about the same as that of the two acting in concert. That in the present state of knowledge no absolute data can be given as to the time occupied by the action of the local mechanism for any given distance.—*Journal of Physiology*, vol. vi., Nos. 1 and 2.

THE SALIVARY SECRETION.—Dr. J. N. Langley has studied this subject by experiments upon animals. Bernard was the first to show that when the chorda tympani is cut in the dog, there follows a slow continuous secretion of saliva from the sub-maxillary gland. The cause of the secretion was sought for by Langley, and he arrived at the following results: When the chorda tympani is cut on one side, the central secretory centre gradually increases in irritability until the blood supplied to it serves as a stimulus. Nervous impulses are in consequence sent down the sympathetic fibres which are still connected with the sub-maxillary gland and the paralytic secretion begins. The increase of irritability of the central secretory centre is not confined to the side on which the chorda tympani is cut, but extends, although to a less degree, to the nerve cells of the opposite side. If all the nerve fibres running to the gland are severed, the paralytic secretion is caused by the peripheral centre only. The state of the gland suggests also that the growth of protoplasm is not brought about by the secretory nerve fibres.—*Journal of Physiology*, vol. vi., Nos. 1 and 2.

RESPIRATORY CENTRES.—Dr. Richard Nitschman has made a series of experiments upon chloralized rabbits, and arrived at the following conclusions about the centres of respiration. There are automatic respiratory centres in the cervical spinal cord. These cervical centres of respiration can be longitudinally divided without the respiration experiencing any change, so long as the division is in the median line. After longitudinal division of the cervical cord and the calamus scriptorius, the respiration remains alike on both sides of the body, but upon irritation of the vagi, trigemini, and brachial it is not synchronous, whilst irritation of the sciatic causes both halves of the diaphragm to act alike.—*Pflüger's Archiv*, Band xxxv., 10, 11, and 12 Heft.

VAGINAL MOVEMENTS.—Dr. Jastreboff has made a series of experiments upon the vagina of rabbits, and arrived at the following conclusions :

1. In the wall of the vagina are automatic nerve-centres which cause rhythmic contraction of the separate segments.
2. A direct electric tetanization of the vagina causes peristaltic contractions.
3. Weak irritation of the central end of the sciatic causes anti-peristaltic contractions.
4. Extreme anæmia causes an increase of the vaginal peristalsis. —*Archiv für Physiologie*, von Du Bois-Reymond, 1884, Heft 6.

IS THE NERVOUS IMPULSE DELAYED IN THE MOTOR-NERVE TERMINATIONS?—Dr. Hoisholt has made a series of experiments upon this subject, using the nerves of frogs. His results were as follows : A preponderance of the maximum contraction by direct stimulation of the muscle. A great difference in the latent period by stimulation of the nerve-trunk near the hilus, and of the muscle-substance rich in nerves. This is ascribed by Bernstein to a delay in the process of stimulation at the motor-nerve terminations, where the amount of latent power set free is to accumulate until it equals the stimulus necessary for the muscle. More probably, however, it is dependent upon the summation of stimulus. A latent period by stimulation of nerveless muscle-substance, which, in some cases, was the same as that resulting from nerve stimulation, more frequently, instead of being shorter, was longer than the latent period obtained by stimulation of the nerve. Although this last paradoxical result remains inexplicable, the related experiments render at least an affirmative answer to the question heading this article highly improbable.—*Journal of Physiology*, vol. vi., Nos. 1 and 2. ISAAC OTT, M.D.

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c.—GENERAL PATHOLOGY OF THE NERVOUS SYSTEM.

DOUBLE INFANTILE SPASTIC HEMIPLEGIA.—In the January number of the *American Jour. of the Med. Sciences*, Dr. S. J. McNutt reports a case of double infantile spastic hemiplegia, with carefully recorded notes of the post-mortem appearances, illustrated with seven cuts, exhibiting the lesions found. This is believed to be the third, or, at the most, the fourth, case of its kind upon record. Dr. McNutt has collected and tabulated thirty-four cases in which autopsies have been made, and each of them presented atrophy of the cerebral cortex, near the fissure of Rolando. The main features of the cases having autopsies are presented in the following table :

No.	Physician.	Sex and Age.	Seizure.	Symptoms.	Autopsy.	By whom reported and where.
1	Heschl,	M. 26 yrs	From birth left extremities weak.	Left hemiplegia; contractures; speech impaired.	Central segment centrum ovale with convolutions pertaining to it absent on right side from the convexity to the fissure of Sylvius.	Kundrat, Die Porencephalie, 1882.
2	Heschl,	F. 7 yrs	. . . .	Right hemiplegia, with contractures.	Absence of ascending convolutions; left hemisphere defective, communicates with lateral ventricle of that side.	Kundrat, Die Porencephalie, 1882.
3	Brechet,	F. 3½ yrs	. . . .	Right hemiplegia, atrophy.	Left hemisphere defective.	Kundrat, Die Porencephalie, 1882.
4	Maschede,	F. 27 yrs	. . . .	Left hemiplegia.	Right parietal bone defective ½ in. behind coronal suture, the opening 3 in. by ½ to 1 in. Right hemisphere presents cavity in posterior half. Walls of connective tissue of neighboring convolutions rusty brown.	Kundrat, Die Porencephalie, 1882.
5	Rogers,	M. 41 yrs	When 15 yrs unconscious 3 weeks; recovered with paralysis of left leg and arm.	Left hemiplegia with atrophy.	Anterior half of right hemisphere atrophied.	Kundrat, Die Porencephalie, 1882.
6	Rogers,	M. 49 yrs	Dates from convulsions in youth.	Right hemiplegia; weak-minded.	Left hemisphere has a cavity connected with ventricle.	Kundrat, Die Porencephalie, 1882.
7	Hugel,	F. 5 yrs	Asphyxiated at birth.	Left hemiplegia.	Right hemisphere presents an excavation in anterior half 1½ x 2 x ¾ in.	Kundrat, Die Porencephalie, 1882.
8	Brodowski,	F. 12 yrs	. . . .	Right hemiplegia; strabismus, nystagmus.	Communication between fissure of Sylvius and ventricle. Surrounding convolutions converge into this cavity.	Kundrat, Die Porencephalie, 1882.
9	Kundrat,	M. 15 mo	. . . .	Left hemiplegia, contractures.	Right hemisphere atrophied, especially about fissure of Rolando.	Kundrat, Die Porencephalie, 1882.
10	Kundrat,	F. 5 yrs	1 year before death.	Double hemiplegia; idiocy.	Atrophy about lower ⅔ fissure of Rolando; right more affected than left. Sulcus communicates with lateral ventricle. Septum pellucidum absent.	Kundrat, Die Porencephalie, 1882.
11	Sperling,	F. 29 yrs	Difficult labor.	Hemiplegic at birth; shortening of the arm and leg, contractures of hand; intelligent, was a chorister.	Depression behind fissure of Rolando, including the ascending parietal convolution; cicatricial tissue and pigment.	Kundrat, Die Porencephalie, 1882.
12	Cazauvieilh	F. 59 yrs	. . . .	Left hemiplegia, contractures; sensibility and intellect not impaired.	Convolutions of right hemisphere less developed than left.	Cazauvieilh, *Arch. Gén. de Méd.*, 1827, xiv., p. 5.
13	Cazauvieilh	F. 51 yrs	. . . .	Right hemiplegia, including face; right mamma undeveloped	Convolutions left hemisphere less developed than right; intellect obtuse.	Cazauvieilh, *Arch. Gén. de Méd.*, 1827, xiv., p. 5.

No.	Physician.	Sex and Age.	Seizure.	Symptoms.	Autopsy.	By whom reported and where.
14	Cazauvieilh	F. 42 yrs	. . . .	Left side paralyzed and undeveloped.	Right hemisphere atrophied.	Cazauvieilh, *Arch. Gén. de Méd.*, 1827, xiv., p. 5.
15	Cazauvieilh	F. 30 yrs	. . . .	Left half of body emaciated, especially leg; mouth drawn to right side. Epileptic; voracious appetite; intellect obtuse.	Left hemisphere defective.	Cazauvieilh, *Arch. Gén. de Méd.*, 1827, xiv., p. 5.
16	Cazauvieilh	F. 68 yrs	From birth.	No voluntary movements; right side of mouth drawn to left; contractures.	In posterior part of left frontal lobe, a cavity having an "accidental" opening into the ventricle.	Cazauvieilh, *Arch. Gén. de Méd.*, 1827, xiv., p. 5.
17	Cazauvieilh	F. 27 yrs	. . . .	Right hemiplegia with atrophy.	Left frontal lobe less prominent than right.	Cazauvieilh, *Arch. Gén. de Méd.*, 1827, xiv., p. 5.
18	Morgagni,	. . .	. . . .	Hemiplegia.	Atrophied zone from convexity to base, in frontal lobe, most marked in medullary substance.	Cazauvieilh, *Arch. Gén. de Méd.*, 1827, xiv., p. 5.
19	Little,	18 yrs	Instrumental delivery; mother died.	Right hemiplegia with atrophy and contractures.	Whole left hemisphere atrophied; surface of right hemisphere cicatrized with remnant of old clot.	Little, *Trans. Obst. Soc.*, London, 1862.
20	Gibb,	Stillborn.	Mother during pregnancy received an accidental blow on abdomen by a board.	Rigid contractures of joints of limbs of left side, without breaking tendons could not be extended.	Right parietal bone ecchymosed; remains of old clot in right hemispheres above ventricle.	Gibb, *Lancet*, Nov. 13, 1858.
21	Pullain,	F. 8 yrs	. . . .	Atrophy right extremities; intelligence small.	Left hemisphere smaller than right.	Steffen, *Gerhardt's Hdb. Kinderkrankheiten*, xix., p. 243.
22	Bourneville,	F. 16 yrs	At 16 mos. with spasms of right extremities.	Right hemiplegia, atrophy.	Atrophy of left hemisphere, especially of ascending frontal, ascending parietal, paracentral lobule, and 1st frontal convolution.	Steffen, *Gerhardt's Hdb. Kinderkrankheiten*, xix., p. 243.
23	Henoch,	F. 19 yrs	At 3 mos. convulsions, followed by paralysis.	Right hemiplegia, atrophy, contractures; speaks in one syllable; intellect poor.	Middle upper part of left hemisphere occupied by cyst; right pyramid ½ normal size; hematoidin crystals in wall of cyst.	Henoch, Hd. f. d. Kinderkrankh., 1883, p. 231.
24	Henoch,	F. 12 yrs	. . . .	Right hemiplegia, atrophy, contractures.	All convolutions of left hemisphere small, rusty-brown color; pia adherent.	Henoch, Hd. f. d. Kinderkrankh., 1883, p. 231.
25	Henoch,	F. 5 yrs	Healthy to 1½ yrs. After carriage accident suddenly paralyzed.	Left hemiplegia; destructive temperament; speech impaired.	Right upper frontal convolution atrophied posteriorly; dense and white.	Henoch, Hd. f. d. Kinderkrankh., 1883, p. 231.
26	Henoch,	M. 6 yrs	Healthy to 6 months, then had measles with convulsions 8 days, followed by general muscular rigidity.	Double hemiplegia, contractures; stuttering, imbecility.	1st frontal convolution on both sides atrophied, also 2d, but in less degree. Corpus callosum, fornix, and septum lucidum atrophied.	Henoch, Hd. f. d. Kinderkrankh., 1883, p. 231.

No.	Physician.	Sex and Age.	Seizure.	Symptoms.	Autopsy.	By whom reported and where.
27	Rénoy,	F. 4 yrs	From convulsions at birth.	Left hemiplegia, contractures, strabismus; spoke badly, intelligence weak.	Atrophied right hemisphere, especially about fissure of Rolando, with secondary degeneration of pyramidal tracts.	Rénoy, *Progrès Méd.*, 1879, p. 769.
28	Huebner,	2½ yrs	When 15 months had fever with convulsions, followed by complete paralysis.	Double hemiplegia, contractures of extremities; little intelligence, no speech.	Atrophy of both ascending convolutions of left hemisphere, with anterior part of right inferior parietal lobule; right lenticular nucleus. Anterior half of pons, with pyramidal tracts in it destroyed. Embolus found in right middle cerebral artery from root to bifurcation.	Huebner, *Berl. klin. Wochenschr.*, 1882, p. 737.
29	Suckling,	. . .	. . . .	Hemiplegia, contractures, atrophy, epilepsy.	Atrophy about fissure of Rolando.	Suckling, *Bir. Med. Rev.*, 1883, p. 55.
30	Ross,	F. 2½ yrs	Congenital.	Double hemiplegia; monosyllabic speech.	Sulcus occupying central convolutions on both sides; bottom sulcus opened into lateral ventricle; pyramids and lateral columns small. No cicatricial tissue. Giant cells of third layer absent in atrophied part.	Ross, Dis. Nerv. Syst., 1883, vol. ii., p. 480.
31	Lambl,	F. 12 yrs	. . . .	Right hemiplegia, strabismus, nystagmus; intelligence good; practised clairvoyance.	Depression in left hemisphere occupying fissure of Sylvius; lower part of ascending convolution of island of Reil and anterior part of first temporal convolution atrophied.	Lambl, *Arch. d. Psych. u. Nervenheilkunde.*
32	Lachi,	F. 44 yrs	. . . .	Right hemiplegia, with weakness of left leg; atrophy and contractures.	Atrophy about anterior part of fissure of Sylvius on left side; bottom of fissure opens into ventricle; septum lucidum absent.	Lachi, *Rev. Clinical*, Feb. 1884, p. 152.
33	Blanchi,	M. 73 yrs	Convulsions in early infancy.	Right hemiplegia, with weakness of left leg; atrophy and contractures.	Deep sulcus occupying central convolutions of left hemisphere, communicating with ventricle. Similar sulcus occupying superior third of central convolutions of right hemisphere. Paracentral lobule not affected. No descending degeneration.	Bianchi, Abst. *Am. J. Neurol. and Psychiatry.*
34	McNutt,	F. 2½ yrs	Feet presented; instrumental delivery; convulsions for 9 days after birth.	Double hemiplegia, contractures, dysphagia, and dyspnœa; intelligence small.	Atrophy about the fissure of Rolando on both sides. Atrophy affects most the base of convolution, giving mushroom shape. Descending degeneration of both pyramidal tracts. Atrophy of larynx with puckering of mucous membrane over vocal cords.	McNutt, *Amer. Jour. Med. Sci.*, Jan., 1885.

A Contribution to Jacksonian Epilepsy and the Situation of the Leg Centre.—Dr. William Osler, of the University of Pennsylvania, records, in the January issue of *The American Journal of the Medical Sciences*, the history of an instructive case of Jacksonian epilepsy. His case lasted over fourteen years, the convulsions beginning in the left hand, at first monobrachial, then extending to the leg, afterwards becoming unilateral, and finally general; at first without loss of consciousness. For the last nine years of the illness there were remarkable intermissions, lasting for six or seven months, once an entire year. Six months after the onset the left leg got weak and stiff. For four years, the tenth, eleventh, twelfth, and thirteenth of the illness, the seizures were frequent. During this period there were six weeks of unconsciousness in which the spasms were very frequent, fifty to eighty in the day. Ten months prior to the final attacks there was freedom from convulsions. The intellectual faculties were unimpaired. The case is unusual in the limitation of the lesion to the ascending frontal convolution, and to its fasciculus of white matter, scarcely involving the gray substance, which is commonly affected in cortical epilepsy. The accurate localization, and the remarkable absence of tissue-changes in the immediate vicinity, give the case the nature of an exact physiological experiment. With this limited lesion of the motor area, there was permanent paralysis with contracture of one extremity and epileptiform convulsions. Another feature of interest in the case is the light it throws on the situation of the leg centre. The fibrous mass was situated entirely within the anterior part of the paracentral lobule, limited in extent, confined chiefly to the medullary fibres of the superior frontal fasciculus, and only touched the gray matter in places. A point to be referred to is the absence of the paralysis of the leg for the first six years, for, if the convulsions and monoplegia were caused by the same lesion, how explain the late onset of the latter? From the fibroid state of the tumor it might reasonably be inferred that it was originally larger and had shrunk, but the absence of puckering on the surface, and the way in which the margins merged with the contiguous parts, make it probable that the growth was always small—so small, in fact, that at one period of its development, it may have caused sufficient irritation to induce the convulsions, and yet at the same time not involve the special fasciculi of white fibres to the extent of producing weakness of the leg or monoplegia.

A Case of Lodgment of a Breech-Pin in the Brain; Recovery.—Dr. G. W. H. Kemper, of Muncie, Indiana, reports in the January number of *The American Journal of the Medical Sciences*, a very instructive case in which a lad received a compound fracture of the frontal bone, immediately above the right frontal sinus, by a bursting gun. The breech-pin was found imbedded in the brain at a distance of one-half inch, and was withdrawn by the aid

of dressing-forceps. No untoward symptoms were developed until the evening of the fourth day, when a convulsion ensued because of pent-up pus, and after the removal of the cause no further trouble followed. The lesson to be derived from the study of the case is the necessity of maintaining free drainage, thus preventing an abscess from extending in the brain and becoming fatal.

Syphilis of the Nervous System.—Dr. S. G. Webber read before the Boston Society for Medical Improvement, an abstract of a paper which is to appear in the coming volume of the Boston City Hospital Report. The following are some of the conclusions that he has reached: There is no pathognomonic symptom of syphilis of the nervous system; the diagnosis must be made by grouping the manifestations, and viewing them and their history as a whole. Among the more frequent peculiarities is irregularity of the phenomena and their ephemeral nature, disappearing to come again. Headache is the most common and the earliest symptom of the central nervous system, and gives timely warning that the subsequent dangers may be avoided. Its characteristics are severity, with remissions or intermissions. The pain is persistent, or returns again and again. It is often, but by no means always, most severe in the latter part of the day or night. It may be limited or general, unilateral or bilateral. Nausea and dizziness are generally absent. The ocular nerves are more frequently paralyzed than the other cranial nerves, and in general, paralysis is preceded by headache or trifacial neuralgia. Hemiplegia is less likely to be sudden than to occur gradually, to be intermittent, to be preceded by headache, and to be accompanied by numbness of the same parts. Syphilis of the spinal cord is less common than cerebral syphilis. Its prognosis is much less favorable, and it also has no pathognomonic symptom. Perhaps many of the cases of locomotor ataxia reported cured were really cases of syphilitic neuritis. Syphilitic neuritis of peripheral nerves is not common, and is not easily recognized as such. The time at which nervous symptoms appear after the primary sores varies in Dr. Webber's cases from two and a half months to twenty-five years; the majority coming, as is reported by other observers, within three years. The reader hesitated to say much of prognosis. If headache exists alone, or if the symptoms are variable and intermittent, the prospect is fair. If there be organic change, recovery is doubtful, although the disease may be arrested. Some cases must be treated, at least intermittently, for many years, even after symptoms have disappeared. Slight cases may be treated with fifteen or twenty grains of iodide of potassium three times daily, continued many weeks after apparent recovery. In serious cases temporizing is dangerous, and iodide of potassium and mercury should be given in sufficient doses. Of the iodide, from seventy to two hundred and twenty-five grains have been given in the cases reported. Larger doses have been given by the

reader, but without benefit and without harm. In some cases small doses have been badly borne, but on increasing the dose the unpleasant symptoms have disappeared.—*Boston Med. and Surg. Jour.*, No. 12.

Locomotor Ataxy, without Disease of the Posterior Columns of the Spinal Cord.—Dr. A. Hughes Bennett read notes of this case before the Clinical Soc. of London, Feb. 27th. The patient during life presented all the prominent symptoms of tabes dorsalis, while after death the posterior columns and cornua of the spinal cord were found without a trace of disease. From this fact, important physiological and pathological conclusions were drawn. The patient, a man, aged forty-eight, suffered from all the usual symptoms of locomotor ataxia, including inco-ordination of movement, without loss of muscular power, a typical ataxic gait, Romberg's symptom, impaired and retarded sensibility of the lower extremities, lancinating pains, and loss of the knee-jerk phenomena. After death evidences of general acute cerebritis were found, with patches of recent softening. In the medulla oblongata, there was a mass of sarcomatous infiltration occupying its posterior and central aspects ; with the exception of one anterior cornu in a limited portion of the lumbar region, the spinal cord was perfectly normal throughout, as were also the posterior cornu, and roots within the circle of the spinal membranes. Outside these the posterior roots in the dorsal and lumbar regions were found involved in a mass of sarcoma, which extended as far upwards as the cervical portion of the cord. In the lumbar region the anterior roots were implicated, but only to a very limited degree. Microscopic preparations and drawings illustrating these facts were shown at the meeting. In commenting on this fact, special attention was directed to the pathological and clinical phenomena. It was pointed out that the patches of central softening were probably quite recent, and due to the acute cerebritis, which supervened shortly before death. The sarcomatous growth in the medulla was stated to be a rare pathological condition ; and the absence of pronounced bulbar symptoms was explained by the supposition that the morbid material had infiltrated the normal structures, without causing their serious degeneration. Although one anterior horn was implicated, and some of the anterior roots slightly involved in the disease, it was evident that this had caused few symptoms during life, as the motor power was unimpaired, there was no muscular wasting, and the retinal reactions were normal. The clinical point illustrated by this case, to which it was the object of the paper specially to direct attention, was the relation which existed between the spinal symptoms and the lesions in the posterior roots of the cord. It was pointed out that the patient during life suffered from all the prominent symptoms of tabes dorsalis, and presented a fairly typical clinical picture of what was understood of that disease. It was then stated that the universal belief was that the essential lesion of locomotor ataxy

was sclerosis of the posterior root-zones of the cord. In the case under consideration there was no trace of disease of any portion of the posterior columns, proving that, for the production of ataxy, degeneration of the cord was not an essential factor. Reference was made to the cases published by M. Déjerine, in which there were all the symptoms of tabes, and after death only parenchymatous neuritis of the peripheral nerve-endings found, the cord-roots being intact. From this it was maintained that interruption of the different paths, at the periphery, was capable of causing ataxy in as characteristic a manner as when these tracts were diseased in the cord. The case under notice showed that lesion of a third locality, namely, of the posterior spinal roots, might produce the same effects. It was asserted that this was a pathological confirmation of the experimental researches of Van Deen and Claude Bernard, who, by dividing the posterior roots, induced inco-ordination of movements without motor paralysis. It supported the view that those elements which conveyed the impulses regulating co-ordination, were situated in the afferent paths of the nervous system. Whatever theory be advanced to explain the physiology of locomotor ataxy, this case served to show that the point at which, in the causation of the phenomena, the nervous path was interrupted, must not of necessity, as was generally asserted, be primarily situated in the posterior root-zones of the spinal cord. Reflection on this fact suggested that the anatomical substratum of that protean disorder which was at present recognized under the term tabes dorsalis, had not yet been fathomed. The assemblage of symptoms probably consisted of a combination of different pathological conditions, many of which were represented by phenomena common to all, and each of which in time might be distinguished. It was possible that a case such as the present might prove as a link in the chain of discovery.—*Brit. Med. Jour.*, No. 1,262.

Clonic Spasms of Upper Limbs.—Dr. C. E. Beevor read a paper before the Medical Society, London, on clonic spasm of the upper limbs, with anæsthesia of the left side, in a girl aged 16, who had scarlet-fever ten years before she came under observation, and, six months after the fever, began to have twitching of the head and face to the left, and movements in both arms. She came under treatment by Dr. Barlow for choreiform movements affecting all the limbs seven years ago; movements had persisted ever since. A year ago, the left arm alone was affected with pronation, extension of the elbow, and adduction of the shoulder, but voluntary movements were possible ; she also had occasional rapid twisting of the head, and both eyes were turned to the left. In October, 1884, the right arm was affected in a similar way, and the left arm became anæsthetic and analgesic. When the patient was shown at the meeting, the movements of the left arm were much quieter, but the limb was almost completely paralyzed, and

anæsthetic and analgesic. The anæsthesia also affected the whole left side of the trunk, head, and neck,—except the face, which was only somewhat anæsthetic—down to the umbilical level. Below this level there was a less degree of anæsthesia. In the area of complete anæsthesia, touch, pain, heat and cold, and sensibility to a strong faradic wire-brush were all abolished. In the conjunctiva, nostril, mouth, tongue, and fauces, on the left side, sensibility was deficient. In the left arm there was complete loss of muscular sense to weights and passive movement. Sight was not affected, nor the field of vision. The other senses were not affected, and there was no optic neuritis. In the arms, the muscles affected corresponded, according to Ferrier's and Yeo's experiments, to the sixth and seventh cervical nerves. The case was probably an instance of a functional or hysterical nature. The movements were irregularly rhythmical, about sixty to eighty per minute, ceasing during sleep; and, though simulating chorea, were much more regular, and affected only certain muscles; the movements of one arm were synchronous, but the two arms did not move as a rule at the same time.—*Brit. Med. Jour.*, No. 1,265.

Nervous Lesions by Lead-Poisoning.—Arthur Robinson, M.B.,C.M., (from Path. Lab. Owen's Col., England, *Brain*, xxviii., p. 485,) reports a case of lead paralysis with autopsy. (Dr. Leech's case, Manchester Royal Infirmary). A male, æt., 30; a painter for fourteen years, had his first attack of drop-wrist in the summer of 1877. It continued through the winter, recovering the following spring. Every winter after, the attack returned; continuing until spring. He never had colic or cramps, but was troubled by frequent micturition. When examined, in December, 1882, the muscles of both forearms were very much atrophied, the extensors of the wrists and fingers were completely paralyzed, while the flexors retained a fair amount of power. The muscles of the thenar and hypothenar eminences were also atrophied, and the patient could not oppose his thumbs. He could pronate, but could only partially supinate both forearms. The peroneus brevis and longus muscles on the left side were atrophied and paralyzed, and those of the right side were affected with paresis. All the atrophied muscles showed the reaction of degeneration when tested with electricity. The patient was treated with iodide of potassium and the interrupted and continuous currents were applied to the affected muscles. He gradually improved; the atrophied muscles increased in size, and to a certain extent regained their power. Discharged much improved, in 1883, he returned in June, 1884, his muscular status much the same, but with œdema of the extremities, pleuritic effusion, albuminous urine, and granular casts; later ascites developed, and death occurred August, 1884. The autopsy revealed small kidneys with adherent capsule; and, on microscopical examination advanced cirrhosis. The spinal cord and parts of the musculo-spiral nerves

were examined, but not the radial nerve or the muscles. In the cord there was no visible abnormal change in any part of the nervous matter or the neuroglia; the vessels, however, exhibited well-marked hyaline degeneration of the walls of the arteries, both in the gray and white substance of the cord, affecting perceptibly the middle and outer coats of the vessel. The cellular elements were swollen; the nuclei were not visible, and they did not stain with either carmine or logwood. The nerves examined were likewise normal, except that the small arteries in the nerve-sheaths also exhibited a hyaline change. There was no proliferation of the nuclei of the nerve-sheaths, or increase of connective tissue; no fragmentation of the myeline sheaths, or indistinctness of the axis-cylinder. The sections of the cord were treated with carmine alone, and with carmine and osmic acid. The nerves, by longitudinal transverse section, also by teasing; stained with carmine and orsmic acid. The author, in making a summary of recorded cases with autopsy, has overlooked Birdsall's case, and a case of Seguin's reported in Birdsall's article published in 1882.

A Peculiar Atrophic Paralysis in Several Children of the Same Family.—Dr. Schultze, of Heidelberg, reports the cases of three children, aged respectively three, seven, and eight years. All were born healthy, and without any known hereditary taint, learned to walk at nine months, but all became affected in the same manner, when about two years old, with a progressive atrophic paralysis, which first involved the peronei then attacked the tibial and crural groups, producing talipes, and, in the oldest girl, finally invading the hands and forearms. Sensory disturbances were but trifling. The reaction of degeneration was present in the muscles and nerves involved. The author favors the view that the symptoms are dependent on a multiple peripherical affection.—*Centralblatt f. Nerv. u. Psych.*, Feb.

W. R. Birdsall, M.D.

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d.—MENTAL PATHOLOGY.

Puerperal Transitory Frenzy.—Under the title of puerperal insanity cured by timely catharsis, Dr. T. N. Reynolds (*Med. Age*, May 25, 1883) reports the following case, which he saw two and a half days after delivery. For two days unremitting puerperal insanity of the maniacal form had existed. The patient was being forcibly held, screamed almost incessantly, and dashed from her every thing but an occasional drink. There was no uterine inflammation, the bowels had not moved. She was given three drops of croton oil in her next glass of water. A full evacuation followed, with two or three watery passages afterwards; she grew gradually quiet, soon went to sleep, and had not any more symptoms of puerperal insanity. It will be obvious that the

case was one of transitory frenzy which would have recovered without treatment. The treatment adopted was, however, not contra-indicated, although the results are far from illustrating the point raised by Dr. Reynolds.

CAUSES OF SITIOPHOBIA AMONG THE INSANE.—Dr. O. Everts (*American Journal of Insanity*, 84–85) calls attention to certain neglected causes of sitiophobia as follows: "Observant of every thing, the hospital physician should be particularly sensitive to, and careful respecting, little things—things that are likely to be overlooked, or disregarded as 'little,' by the insensitive, indifferent, ill-bred. And there are such—I grieve to say so—in this broad land of freedom and democracy; persons, for example,—I have seen such prescribing for the sick,—who would smile incredulously, or derisively, at the protest of a patient alleging inability to drink from a cup, or dip from a bucket, used in common by the patients of the hospital ward, or complaining of loss of appetite, and inability to eat, because of offensive odors, or the disgusting appearance or habits of table associates. I have known persons, also employed in hospitals in official positions, who could not comprehend the delicacy of feeling that would cause a person of refinement, even when insane, to shrink from bathing in company —two or more persons occuping the same tub and water, and using the same towel,—notwithstanding the impatience of attendants required to bathe a certain number of persons within a given number of hours. But such persons, it is needless to say, are unfit for hospital service; and such 'little things' are too important to be pooh-poohed, or neglected, in the treatment of the insane. They are quite as important, indeed, to be known of, and attended to, as is the occasional necessity for, and skill in, the use of the stomach-tube for involuntary alimentation; or the voting qualification of appointees of political hospital-boards."

MELANCHOLIA AND GLYCOSURIA.—Dr. C. H. Hughes (*Weekly Medical Review*, October 20, 1883) says that notwithstanding the long-recognized association of hepatic and gastric disorders with depressed types of insanity, depending often upon co-existent atonic conditions, it is only of late that a somewhat intimate relationship between them and glycosuria has been noted. In some cases the glycogenic function is markedly disturbed, sometimes co-existently, at others alternately, with mental aberration; and more notably in connection with the depressed types, sufficiently often, it may be justly remarked, to justify an examination of the urine in all cases, especially of atonic melancholia, with a view to ascertaining whether the urine be not surcharged with sugar. Enough of such cases have fallen under his observation to justify the suspicion that others might have been found had the urine been tested during the different stages of mental depression, and during the precursory stage of approaching melan-

cholia. He has had under observation a middle-aged gentleman, who, after unusual business strain, was attacked by glycosuria. His skilled and experienced physician found this conditon existing. After several months' treatment, though the glycosuria improved, his depression persisted and became aggravated. Cannabis indica, codeine, arsenic, strychnine, and hypophosphites, with electricity, change of air and surroundings, caused both melancholia and glycosuria to disappear ; the latter had been most excessive when the depression was least. The gentleman remained robust and well for a year, but is threatened with a return of the trouble. Dr. Hughes believes that this class of cases is far from infrequent, and that glycosuria and melancholia may have prognostic significance. He gives in such cases, disregarding the glycosuria, such treatment as will restore nerve-tone in melancholia, giving preference to sweet- and butter-milk, and animal and vegetable soups. The condition of the nervous system justifies this plan of treatment. The condition of the vaso-motor system is an organic justification for disordered hepatic function, and this is why albumen, as well as sugar, is found in the urine of melancholiacs, even of such as recover. Dr. Hughes is satisfied, from clinical phenomena and results of treatment, that there is an intimate relationship between nervous depression and glycosuria. The influence of agencies that conserve, recuperate, and tranquillize the nervous energies tends to prove this. He has applied galvanism especially to the occipital regions, though he has been better satisfied by a descending cerebral current from the cortex down through the medulla, thence to the dorsal spine and through the liver, not omitting a gentle systemic séance. It seems probable that, as has been suggested by De Wolf (*Journal of the American Medical Association*, Dec., 1883), that there are two types of glycosuria, dependent on opposite cerebral conditions.

Abdominal Lesions in Paretic Dementia.—Dr. Carrier, Lyons, France (*Annales médico-psychologiques*, March, 1885), concludes: First. That congestive thoracic and abdominal visceral phenomena observable in the course of paretic dementia are seemingly due to the invasion by the cortical lesion of centres in relation with the great sympathetic system. Second. Lesions of this kind explain not only the visceral congestions and changes in nutrition, but also the melancholiac symptoms which accompany these phenomena, and especially the hypochondriacal delusions. Third. If the melancholiac delusional conception is to be localized in any part of the cerebral cortex, it should be in those regions most in relation with the grand sympathetic,—a region capable of giving rise to the state of consciousness likely to produce them. Dr. Carrier is not too well acquainted with recent cerebral anatomy.

Pre-Ataxic Psychoses of Luetic Ataxia.—Dr. Fournier (*L'Encéphale*, No. 6, 1885) concludes that the medullary symptoms

of luetic ataxia may be preceded by psychical phenomena bearing a more or less complete resemblance to paretic dementia.

TYPHOID FEVER AMONG THE INSANE.—Dr. Rath (*Allgemeine Zeitschrift für Psych.*, B. xli., Hft. 3) states that an epidemic of typhoid fever occurring among the insane was marked by the absence of psychical symptoms. The fever was brief, and roseola occurred in one case only. Convalescence was rapid. Under the influence of the fever twenty-one per cent. of the cases attacked recovered, forty-two per cent. had a temporary remission of the symptoms, twenty-nine per cent. remained unimproved, and eight per cent. died. These results are much the same as those obtained by Campbell (*Journal of Mental Science*, 1882-83), and de Monteyel (*Annales médico-psychologiques*, s. vi., t. ix.), and seem to hint at the possibility of good results from energetic therapeutic measures, with allied effects to those of typhoid fever.

TRIPLE DIATHESIS IN A MELANCHOLIAC.—Rousseau (*L'Encéphale*, No. 6, 1884) mentions a melancholiac who had been badly treated by her husband, and acquired syphilis from him. She was then attacked with atrophy of the optic nerve ; motor together with sensorial impairment. The patient died, four years after the beginning of psychosis, from lung disease. The autopsy showed a gummy swelling of the dura at the base, and it had become adherent to the left half of the cerebellum. The same part of the cerebellum was also the seat of an isolated, centrally located carcinoma ; the central ganglia, especially the thalami, were discolored and softened. Besides the syphilitic and carcinomatous diatheses, there appeared a third, tuberculosis, which was limited to the lungs.

BLOOD OF THE INSANE.—Dr. H. Sutherland (*Journal of Mental Science*, April, 1884) concludes that in the insane generally a leucocythæmic condition frequently exists ; that any great increase in the number of leucocytes at the expense of the red, and an absence of rouleaux from the blood of the insane, are conditions which generally indicate a very low degree of vitality ; that in paretic dementia, epileptic insanity, and hebephrenia, the blood is most deteriorated and the vitality lowered in the male. In mania, melancholia, and dementia the same is the case with the female. It is obvious that the conditions designated under mania, melancholia, and dementia are not clearly demarcated from each other and from various other forms of insanity, and that this vitiates the value of these results.

THE KANKAKEE SYSTEM OF INSANE HOSPITAL CONSTRUCTION.—Dr. F. H. Wines (Eighth Biennial Report of the Illinois

Board of Charities) concludes: First: The amount of land to be purchased should equal one acre for every patient to be provided for, and it should be remembered that land can be bought for a less price when the institution is first established than at any time thereafter. Second: The first step to be taken, is to lay out the ground, with the aid of a skilled engineer, in such a manner as to ensure thoroughly good and sufficient sewerage, and a proper distribution of water-pipes, gas-pipes, and pipes for steam-heating, so arranged that they can be directly connected by branch-pipes with every building. The plan adopted for the placing of buildings should have reference to this system of pipes. The pipes should follow the lines of the streets which are laid out. The land on each side of these streets should be subdivided into building lots, in sufficient number to admit of the gradual development of the institution by the addition of a few buildings at a time, and of sufficient size to avoid crowding the patients in consequence of the too close contiguity of houses. All thought of connecting the "blocks" by corridors should be abandoned. Third: Large tracts must be reserved for pleasure-grounds, for both sexes. Fourth: Not more than from one fifth to one third of the total capacity of the institution should be in the form of a close hospital, and the hospital proper, instead of being made the prominent feature, should be as inconspicuous as possible. This end may be attained by dividing it, and having a separate hospital for each sex. There should be no centre building for the use of the officers of the institution; least of all should the officers be collected together in the building designed for the care of the acute and paroxysmal cases of insanity. Separate residences for officers and their families, scattered over the grounds, are in every respect preferable. Fifth: The medical offices should be entirely separated from those devoted to the transaction of ordinary business. The business offices should be in a distinct building, in connection with the store-rooms for general supplies; and it is this building, not the hospital, which should be ornamented and made to attract the attention of visitors as the principal feature and central point of the architectural design. It should be devoted exclusively to business, and there should be in it no sleeping apartments or living-rooms. If, however, it is desired to give it additional dignity, the hall for amusements may be included with it, and occupy the upper floor. Sixth: There is no rule for the construction of the detached buildings. In respect of size, capacity, and arrangement, they must be adapted to the probable classification of patients and the needs of each class, remembering that the same arrangement is not equally suited for all patients, and that uniformity is as objectionable in detached wards as in any other form of construction. Generally speaking, such buildings should be only two stories in height; basements should, as much as possible, be discarded; the day-rooms should be on the lower floor; the upper floor should consist of large associated dormitories; the amount of floor-space to be allowed is about fifteen square feet

per patient for dining-rooms, thirty feet for day-rooms, and forty-five feet for dormitories. Bars and gratings should be left off the windows. A single building may contain one ward or more, according to circumstances ; but the larger the building, the nearer the approach to the system for which detached buildings are a substitute, and the sacrifice of the advantages of the new system is proportionably great. In planning these buildings, it must constantly be borne in mind that each ward does *not* need to be complete in itself ; and that general dining-rooms, bath-houses and clothing-rooms obviate, to a certain extent, the necessity for elaborate arrangements for these uses in a portion, at least, of the detached wards,—not in all of them. Neither is it necessary to have a resident physician in each house. Seventh : The abandonment of the "main central building with wings" renders it possible to introduce entirely new arrangements of the kitchens, laundries, shops, boiler-houses, etc., in which the work of an institution is carried on.

Epileptic Violence.—Dr. M. G. Echeverria (*Journal of Mental Science*, April, 1885) says that there is no essential difference between the automatic sudden impulses which occur after an ordinary epileptic fit, and those committed by an epileptic lunatic during a frantic paroxysm. In either case the psychical condition which underlies the act, is the same ; in both instances the violence is automatic. Sudden, impulsive acts, related to the psychical manifestations of epilepsy, very often evince in their automatic execution a coherent, planned purpose, and a deliberation which can be disclosed even in the co-ordinate, intellectual operations during the development of the fit, and in those instances that might, at first sight, appear motiveless ; while the outburst of unconscious violence is again by no means so abrupt and instantaneous to render deliberation impossible. The irascible outbursts of epileptics are frequently the psychical exponents of unobserved fits of *petit mal*, may easily culminate in criminal catastrophes, and therefore are of medico-legal value. Epileptics cannot be held responsible for any act of violence perpetrated during their unconscious automatism, which they have no power to control nor capacity to judge.

Aberrations of the Sexual Sense.—Dr. Tarsanow (*Westnik Psikiatrii*, ii., 1884), having had charge of the clinic of venereal diseases at St. Petersburg, Russia, has had for many years frequent opportunities of observing sexual perversities. Pæderasty in many modifications, and also other forms of perverse sexual activity, have been observed by him. From a clinical and ætiological point of view he gives the following classification : Subjects, suffering from perverse sexual desire are divisible into two groups. First, such as are disposed to it from their birth, on account of hereditary neuropathic constitution, and others who have not

inherited it. In the first case the contrary sexual sensations are in the organism from its birth, like the normal sexual desire in a healthy person (hereditary pæderasty); or they may paroxysmally make their appearance in subjects otherwise capable of normal sexual activity (periodical pæderasty); or they may appear with epileptics as psychical equivalents of epilepsy (epileptic pæderasty). The second group of sexual perversity includes all other abnormal desires of sexual origin, brought on by poor education, bad example, or as expression of vicious habits by immoral persons. In this group he places the pathological expressions of sexual desire which appear in senile and paretic dementia (senile and paretic pæderasty). These different types may be combined with each other, thereby forming complicated cases of sexual perversity.

Insults to Authorities by a Paranoiac.—Krafft-Ebing (*Neurologisches Centralblatt*, April 1, 1885) reports the following case: During several months notes were found near a house, mostly in the hand-writing of the son of the owner, which contained mean insults against the emperor, authorities, and his own family. Upon complaint of this son and his mother and sister, several persons of the place were arrested but had to be discharged as innocent, until at last the complainants were arrested and sentenced to prison for several months. The state's attorney ordered a new trial, and with it an examination, by a forensic alienist, of the son, whose actions during the trial had induced doubts, from the start, about his responsibility. The result was, that J. K. was found to be a paranoiac, subject to hereditary influences, with a diseased heart, and had become neurasthenic in consequence of onanism (übermässig getriebener Onanie) and finally lost his balance through influence of pubescence, and therefore at the time of these actions was in an abnormal mental condition. The proceedings against him were suspended.

Disturbances of Written Language in Half-idiots.—Dr. Berkhan (*Arch. f. Psych.*, 1885, xvi., H. 1.) found that in a class for half-idiots and weak-minded, twenty of the forty-four scholars wrote from dictation words wrongly. Dr. Berkhan calls attention to the similarity of these written changes with spoken changes of the stammering, but he could not be certain that both faults were of equal value, pathologically. With some of the scholars a proper, methodical training removed the fault, showing the possibility of its treatment.

Insanity in Michigan.—Dr. Hurd (Report of the Pontiac, Michigan, Hospital for the Insane, 1884) makes the following contribution to State psychiatry: He says that cases of melancholia are much more frequent in Michigan than cases of acute mania. A marked change in this respect has been noted during the past

ten years. Since the opening of his hospital for the insane 166 cases of acute mania and 312 cases of melancholia have been admitted. It will be noticed that the number of cases of acute and persistent mania combined scarcely equals those of melancholia. During the past biennial period fifty-one cases of acute mania have been admitted and 133 cases of melancholia.

MORAL INSANITY AS A DEFENCE FOR CRIME.—The Supreme Court of Pennsylvania (*American Law Register*, March, 1885) not only affirms the existence of moral insanity, but admits that it may, under certain circumstances, constitute a defence for crime. It says: "Moral insanity is not sufficient to constitute a defence, unless it be shown that the propensities in question exist to such an extent as to subjugate the intellect, control the will, and render it impossible to do otherwise than to yield thereto. No mere moral obliquity of perception will protect a person from punishment for his deliberate act. The jury should be satisfied with reference to the act in question that his own reason, conscience, and judgment were so entirely perverted as to render the commission thereof a duty of overwhelming importance. While a slight departure from a well-balanced mind may be pronounced insanity in medical science, yet such a rule cannot be recognized in the administration of law when a person is on trial for the commission of a high crime. The just and necessary protection of society requires the recognition of a rule which demands a greater degree of insanity to exempt from punishment." This decision rests the issue of responsibility not upon *knowledge* but upon power.

RACE AND INSANITY.—Dr. H. M. Hurd (Report of Pontiac, Mich., Hospital for the Insane, 1883–4) says: The Teutonic races, as a rule, suffer from secondary forms of mental disease, and are liable to be victims of quiet dementia, or to entertain systematized delusions. Epilepsy and paretic dementia are not common among them. The Celtic races, on the other hand, suffer from acute mental troubles, and the terminations of their attacks are largely in noisy, chronic mania or irritable dementia. There is about an equal tendency with the Germans to degenerative forms of disease like paretic dementia, paralytic dementia, or epilepsy. English-born patients are more liable to attacks of acute forms of disease, like mania or melancholia, and to active types of degenerative disease, like paretic dementia or epilepsy. They possess more constitutional vigor and more frequently recover from mania or melancholia than the German or Irish. If the termination is in dementia there is an increased probability that the dementia will present monomaniacal features, and that mental vigor will not be wholly lost. Native-born patients from native-born parents are more liable to melancholia or mania, and the latter form of disease is liable to take the form of mania persistent. In relative curability

native-born patients are first, English-born (including Scotch and Canadian) next, Germans next, and Irish last. Of the native-born the colored or mixed African and white races are almost without exception incurable, and generally develop epilepsy or some other degenerative type of disease. The mixed Indian and French (half-breed) are more curable than the mulatto, because possessing more native vigor of constitution and better suited to our climate. Out of 72 cases of paretic dementia, 33, or nearly 46 per cent., were of American birth from presumably American parentage; 20, or nearly 28 per cent., were of English birth (including Canada); 3 were of English descent but born in the United States; 5 were Irish; 5 of Irish descent; 5 were Germans; and 1 a Norwegian. On hallucinatory psychoses it is found that race and nativity have some bearing. On careful analysis of all hallucinatory cases it is found that these have been recorded in a little more than 28 per cent. In natives, however, they have been detected in 23¾ per cent.; in Germans in nearly 25 per cent.; in English (including Canadians and Scotch) in about 27 per cent.; and in Irish in 39 per cent. The proportion of hallucinated patients among the English is doubtless relatively increased by classing with them patients of Canadian birth, many of whom are doubtless of French or Irish descent. These results vary much from those of Spitzka (*Journal of Nervous and Mental Disease*, 1880), but are not as ethnologically thorough.

Increase of Insanity in the United States.—Dr. Foster Pratt, Kalamazoo, Michigan, (*Detroit Lancet*, Dec., 1884,) says that the proportion of insane to native white population, in the Northern States, is 1 in 597; in the Southern States, 1 in 660; and in the District of Columbia and Territories, 1 in 748. That among the foreign white the proportion in the Northern States is 1 in 248; in the Southern States, 1 in 283; in the District of Columbia and Territories, 1 in 236. That among the colored races the proportion in the Northern States is 1 in 545; in the District and Territories, 1 in 680; in the Southern States, 1 in 1,235. That the average proportion of insanity among native whites in the entire United States is 1 in 618; among foreign whites, 1 in 250, and among the colored races, 1 in 1,097; and that the total average for the entire country of all population is 1 in 545 $\frac{19}{100}$. It is a significant fact that the Northern States, including the District and the Territories, containing about 60 per cent. of the entire population, have 70 per cent. of its insane; and that this 10 per cent. of proportional excess is more than supplied by the excess of foreign insane over the number that would result if the ratio of native insane to native population in the North were made the ratio in the foreign population. To illustrate: The average ratio of insane to all native population (white and colored) in the Northern States is 1 to 642. If this proportion be applied to the 5,763,894 foreign born living in the North, the number of

insane resulting among them would be 9,240 instead of 23,989 as it now is—a difference of 14,749, which is much more than the 10 per cent. of proportional excess of insane to population in the Northern States and Territories. Admitting that census tables, prior to 1880, fail to give the full aggregates of the insane, it will be safe, for present purposes, to assume, that, whatever errors there may have been in the totals, the error of each census was fairly distributed between the various elements of population ; so that the census proportion of insane to each class of population was fair and just. This is assuming much, since the errors in the census tables prior to 1880 would affect the foreign population largely from the lack of intelligence shown by the census enumerators ; many of the foreign travelling insane population would escape enumeration. How large such possible errors are may be conjectured from the facts stated by the Illinois State Board of Charities. In 1870 the difference between the number of the insane on the list of the census enumerators and those on the State Board of Charities was 1,377 ; there being on the lists of the Board taken in 1869 1,434 not on the census list, and 115 names not on the board list were on the census list, while 953 names were common to both. Dr. Clevenger (*Medical Journal and Examiner*, 1883) states that he has known of instances where name after name was copied from the Chicago Directory and placed on the census lists as inhabitants of certain districts in the Territories. Such errors of omission and commission seriously vitiate Dr. Pratt's conclusions which are that : First : Beginning with 1860 the foreign-born population had increased, since 1850, nearly 100 per cent., while the foreign-born insane had increased 181 per cent. Second : That at the close of the next decade, in 1870, the total foreign born had increased only about 30 per cent., but the insane of this class had increased nearly 100 per cent. Third : In 1880 the foreign born had increased less than 20 per cent., but their insane had increased 150 per cent.

SUMMER VACATIONS FOR THE INSANE.—Dr. W. W. Godding, Washington, D. C., (*American Journal of Insanity*, October, 1884,) says, speaking of the summer home at Brattleboro, Vt. : " The latter especially impressed me during a visit in the early autumn. Here were the insane, like ourselves, taking their summer vacation, their quiet rooms and pleasant piazzas open to the air and sunshine, with the rest of the hills and the freedom of the birds and trees about them. To their darkened lives this has come as a dream of Arcadia. And in the direction of enlightened provision in the past, I could not sufficiently admire the far-seeing wisdom of the first superintendent (Dr. W. H. Rockwell), who had, when land was cheap, purchased wellnigh a township of meadow and hill and mountain, so that to-day the insane could enjoy this picnic life far from the hospital walls, and take long rambles over the hills all unmolested within their own domains, a world so wide

that they would seem to have no need to sigh for one outside its boundaries."

HOSPITALS FOR THE INSANE.—Dr. S. V. Clevenger (*American Journal of Neurology and Psychiatry*, August, 1884) concludes that the hospital for the insane is an important element in treatment. It should be constructed on the segregate plan with a predominance of associated dormitories. The attendants should be properly chosen, properly treated, and encouraged to take a *scientific* interest in their patients. Under certain restrictions female attendants should be placed in male wards. Restraint should be reduced to the greatest possible minimum and prescribed strictly as a remedy. Employment of a proper nature should be given the patient. Furloughs may be of service, but should be given with great care. A censorship should be kept over correspondence. Each hospital should have two sick wards. Visits of friends should be permitted only when beneficial to the patient. Schools should be established as a means of employment and treatment. Dr. C. H. Hughes (*Alienist and Neurologist*, April, '85) concludes that every insane community of mixed, recent, or long standing cases, or of chronic cases exclusively, should be a home and not a mere place of detention. It should be as unprison-like and attractive as any residence for the non-criminal. It should have at least 640 acres of ground. It should be in the country, but accessible to the supplies of a large city. It should have a central main building as architecturally beautiful and substantial as the State will erect, provided with places of security for such cases as are excited, with a chapel, amusement hall, and hospital in easy covered reach of the feeble and decrepit, and accessible without risk to health in bad weather. Out-houses should be built with rooms attached and set apart for the residence of trustworthy patients, for farmer, gardener, dairyman, shepherd, engineer. Cottages should be scattered about the ground for the use and benefit of such as might enjoy a segregate life. A perfect but not direct nor offensive surveillance should be exercised over all the patients, with a view to securing them the lagest possible liberty compatible with the singular nature of their malady. The head of such a community should be a physician. The largest personal liberty should be best secured to them by provision for the sexes in widely separated establishments.

J. G. KIERNAN, M.D.

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e.—THERAPEUTICS OF THE NERVOUS SYSTEM.

SECONDARY NERVE SUTURE.—Though secondary suture of nerves is a well-recognized operation, one of the two cases reported by Dr. Thomas H. Markoe (*Medical News*, March 14, 1885) is so unique as to deserve recording. A little girl was admitted to the New York Hospital with a wound in the neck. After the disability of the shoulder from the wound had subsided,

it was found that there was loss of power of abduction of the arm and of flexion of the forearm. Supination was limited and feeble. Pronation good. Extension of forearm slightly, if at all, affected. Flexion and extension of hand and fingers not notably impaired. Anæsthesia well marked over shoulder and outer aspect of arm.

There followed atrophy of the deltoid, supra- and infra-spinatus, biceps, and brachialis anticus. The reaction of degeneration appeared in the deltoid and brachialis anticus. The reaction of the muscles supplied by the rhomboid, supra scapular, and long thoracic nerves could not be satisfactorily obtained, but the muscles themselves showed marked atrophy. Dr. M. diagnosed division of the upper cord of the brachial plexus (5th cervical). After waiting vainly four months to see if recovery under galvanism, etc., would occur, Dr. Markoe determined to reunite the cut ends of the nerve by suture. The operation was done one hundred and thirty-one days after the injury. The nerve, which was found to be the upper root of the plexus, as had been originally diagnosed, was divided in two places, so as to include all that part involved in the cicatrix, leaving a clear cut on both distal and proximal ends, through healthy nerve substance. It was then found, if the macroscopic appearances could be relied upon, that it was the short proximal portion that was degenerated and not the distal ; this opinion was founded on the fact that the proximal stump was smaller, its fibres not so clean and glistening as in the cord below and in the surrounding nerve trunks. No microscopic examination, however, was made, and so the fact lacks scientific value. Nine months after the operation the atrophy of the muscles had disappeared, and considerable motion had reappeared. The case promised to be a complete success. Dr. M. concludes with a summary of the results of the operation as given in Weissenstein's collection of thirty-three cases, together with six additional cases. Of these thirty-nine cases, twenty-nine were successes, in so far that sensibility and motility were partly recovered. In six cases no improvement, or almost none, occurred, and in three cases the data were insufficient for statistical use.

Tonic Spasm of the Accessorious Cured by Gymnastics and Massage.—H. S. Beyer reports (*Med. News*, April, 1885) a cure by these means, after all the ordinary means had failed. B. thinks the disease was central, because both the trapezius and sterno-mastoid were involved. General and local massage was given. The gymnastics consisted in swinging a bar, which the patient grasped with both hands, pacing the room, etc., (to exercise the legs). These were practised twice a day, under the supervision of the physician. The patient was still well a year after treatment ceased.

SICK HEADACHES AND ASTIGMATISM.—H. Bendelach Hewetson reports (*Med. Times and Gazette*, March 21, 1885) a number of cases of headache, some accompanied with vomiting, vertigo, etc., which were cured by the correction of astigmatic and other optical defects present. His conclusions are "that many cases of sick headache, when dependent on visual disorder, are the result of the more ordinary forms of optical error, hypermetropia or myopia, *complicated* by astigmatism. If the astigmatism be completely corrected by glasses, which are *constantly* worn, my cases go to show that the bilious vomiting, headache, and chronic dyspepsia will also disappear." It does not appear, however, from the report that all H's cases were true migraine; some certainly were not, though aggravated cases of their kind.

THE TREATMENT OF HYSTERIA BY ISOLATION.—In the *Medical Times and Gazette* is given an abstract of a lecture by Charcot, in which the latter insists upon isolation in the treatment of certain forms of hysteria, and expresses the opinion that by such means we can stifle in the bud nascent hysteria, especially in male children. In illustration, he gives an account of four interesting cases. Three were cases of hysterical convulsions occurring in children of the same family, and brought on in the first place in one child by witnessing some spiritualistic performances, and excited in the other two children by witnessing the attacks of the first child. The fourth case was one of hysterical anorexia. The case was an aggravated one, the symptoms being most alarming. After isolation was submitted to, the patient, a little girl, recovered and made the following confession: "As long as my parents did not leave me, or, in other words, while you had not triumphed (for I was aware that it was you who separated us in spite of their pretended reasons), I believed that my disease was not dangerous, and as I had a horror of eating I did not eat. But when I saw that you were master, I became alarmed, and in spite of my repugnance I tried to eat, and gradually the power of doing so came back."

LIGATURE OF THE COMMON CAROTID FOR TRIGEMINAL NEURALGIA.—Dr. Joseph C. Hutchinson reports (*Med. News*, April 11, 1885) two cases. In one case the operation gave complete relief for three years and eight months, when the pain returned; in the other, not the slightest benefit was obtained. The histories of the cases make interesting reading. The first case had been three times previously operated upon, and twice reported as cured, but the pain each time returned after varying periods. (The operations were removal of molar tooth, removal of alveolar process, and excision of inferior maxillary nerve.) The second case had been previously operated upon four times, and after failure to cure by ligaturing the carotid, a sixth operation was performed, viz., the superior maxillary nerve was removed. This gave relief for two and a half months.

Hüter collected fifty-four cases in which the common carotid was tied for trigeminal neuralgia. Of these, three died—five per cent. The operation was done after all other treatment, medical and surgical, had failed. Prof. John Wyeth has tabulated fourteen cases (including the first of Hutchinson's cases, which are classed among the cured, but the disease returned since the publication of his paper, and three years and eight months after the artery was tied). Gross has added one case, and Hutchinson one—in all, sixteen cases. Of these, one died; fifteen recovered. Of these last, two were total failures, eight were cured, six temporarily relieved—one for two years, one for three years and eight months, one for four years, one for eight months, one for eleven months, one for a short period.

THE EXCISION OF A TUMOR FROM THE BRAIN (*Lancet*, Dec. 20, 1884)—The first attempt to remove a tumor from the the brain has been made by Mr. Rickman J. Godlee by the advice of Dr. Hughes Bennett, and has awakened considerable interest.

The case was that of a young man twenty-five years old. The symptoms were slight twitchings in the left side of the face and tongue, which gradually increased in severity till they culminated in general convulsions and loss of consciousness. Later, spasmodic twitchings followed by paralysis of arm and hand, that of fingers and wrist being complete. Also twitchings and weakness of left leg. Comparative immobility of left side of face. Double neuritis. Also paroxyms of severe lancinating pain in the head and uncontrollable vomiting. Dr. Bennett concluded that, First: There was a tumor of the brain. Second: It involved the cortical substance. Third: It was of limited size, as it destroyed the centres for the hand, and only caused irritation of the neighboring centres; and fourth, it was situated in the region of the upper third of the fissure of Rolando. As the patient's sufferings were intolerable, Dr. Bennett advised operation. When, however, the brain was exposed, no tumor was visible, though the ascending frontal convolution seemed to be somewhat distended. An incision was then made into the gray matter in the direction of the blood-vessels, and one quarter of an inch below the surface a hard glioma, about the size of a walnut, was found and easily removed, hemorrhage being arrested by means of the galvano-cautery. After the operation the patient's condition remained satisfactory for a while. The pains, vomiting, and convulsions disappeared, and the general condition remained good. A hernia of the brain afterwards, however, developed, cerebritis set in, and the patient died.

PISCIDIA, A NEW HYPNOTIC.—Piscidia is contained in the rind of the root of *Piscidia erythrina*, a luguminous tree of the Antilles. The name piscidia, *i. e.*, fish-killer, is derived from the power of a decoction of the root-bark to stun fish, as was well known to the inhabitants of the islands. Leifert made a series of interest-

ing experiments with the dry alcoholic extract, as prepared by Merk. In doses of three sixths of a grain, L. states, the extract was valuable in the violent coughs of phthisis, without causing any bad symptoms. Given to a healthy person the drug produced profound sleep, slight heaviness in the head in the morning, slight enlargement of the pupil, but no effect on pulse, temperature or diuresis. Fronmüller has made 103 experiments with the drug altogether, using different preparations. The patients fell asleep within one half to two thirds of an hour after taking the dry alcoholic extract, and had no after-effects. In five cases the drug proved useless. Compared with opium piscidia is inferior to it in narcotic power, but the piscidia-narcosis is milder and less dangerous, does not constipate, produces no itching, and has no influence on pulse, secretion of the urine or sweat. Piscidia acts also as an anæsthetic.—*Therapeutic Gaz.*, Feb. 16, 1885.

Facial Neuralgia Treated by Nerve Vibration (*Practitioner*, Nov., 1884).—Dr. William H. Neale reports an obstinate case of neuralgia cured by this method. Since December, 1878, the date of the first attack, the patient had suffered every year from repeated attacks of facial neuralgia, lasting many days at a time. The attack under consideration returned January, 1884. The pain began in the right side of the head, spreading to right eye and down the cheek. From January to June there had hardly been twenty-four hours free from pain. Every time the patient attempted to eat or drink he received a sharp twinge, and for many hours every day his life was a burden to him. Drugs had been tried for four months without effect. On June 7th, Dr. N. decided to try nerve vibration. The percuteur was applied nearly every day, dispelling the pain each time after a few moments' percussion, though there was more or less return after a number of hours. At the end of eighteen days the pain and tenderness disappeared for good. On Oct. 24th the patient still continued well. The relief obtained by percussion was immediate each time, though the effect for a minute or two at first was apt to be to intensify the pain. Continued percussion then dispelled the pain.

Osmic Acid in Neuralgia.—Dr. D. Mohr reports a case of rheumatic sciatica cured by two injections of a Pravatz syringeful of a one-per-cent. solution of osmic acid in the neighborhood of the sciatic notch (*Wien. med. Wochensch.*). Prof. Leichtenstern has treated seventeen cases of obstinate neuralgia by this method. The results were considered favorable, as repeated temporary improvements were obtained, while in some cases cures were effected. No improvement was obtained in a case of pseudo-neuralgia due to cancer of the spinal column, in neurasthenic neuralgia, and in old chronic sciatica. In the majority of cases L. observed severe pain following immediately after the injection, and frequently a peculiar form of necrosis and inflammation of the

skin, with the formation of vesicles containing blood. On this account L. warns against injections in the face.—*Deutsche mediz. Zeit.*

THE TREATMENT OF OPIUM ADDICTION (*St. Louis Courier of Medicine*, Dec., 1884).—In a very elaborate and positive article, Dr. J. B. Mattison returns to the treatment of the opium habit. He speaks strongly and positively against the sudden withdrawal of the drug, declaring such a method to be unnecessary, that it entails horrible suffering, is barbarous, inexcusable, mal-practice, etc. M.'s method is the one he has advocated before, namely, the gradual withdrawal of opium, combined with "preliminary sedation," by means of bromide of sodium, to diminish reflex irritation. His plan is to keep the system continually under the bromide influence from the beginning. The bromide must be given in full doses. The initial dose is 60 grains twice daily at twelve hours' intervals, increasing the amount 20 grains each day, *i. e.*, 70, 80, 90 grains per dose, and continuing it five to seven days, reaching a maximum dose of 100 to 120 grains twice in twenty-four hours. During this time of bromide medication, the usual opiate is gradually reduced, so that from the eighth to the tenth day it is entirely abandoned. A decrease of one quarter or one third the usual daily quantity is made at the outset, experience having shown that habitués are almost always using an amount in excess of their natural need, and this reduction occasions little or no discomfort. Subsequently the opiate withdrawal is more or less rapid according to increasing sedation, the object being to meet and overcome the rising nervous disturbance by the growing effect of the sedative; in other words, miximum sedation at the time of maximum irritation. Each case must be treated according to its individual peculiarities, as regards amount of bromide given and rate of decrease of opium, the guide being the effect produced. Elaborate details are given for the treatment of after-effects, etc. Coca, Indian hemp, hot baths, and electricity are recommended as adjuvants for restlessness and insomnia. He insists that Indian hemp must be given in full doses of 60 minims of the fluid extract. M. recommends the administration of opium by the mouth instead of subcutaneously. It is not necessary to put the patient under surveillance or restriction of any kind. M. speaks strongly against the method advocated by Levinstein, and gives a rose-colored account of the results obtained by his own measures.

ERGOT OF RYE—AN INVESTICATION INTO ITS ACTIVE PRINCIPLES (*Practitioner*, Dec., 1884).—Dr. R. Kobert publishes the result of his investigations. Ergot contains ergotinic acid, sphacelinic acid and cornutin. 1. The ergotinic acid is the active principle of Bonjean's extract, of Wernich's dialysed ergotine, and of the sclerotinic acid of Dragendorff and Podwyssotzki. It does not cause uterine contractions nor gangrene, but paralysis, commen-

cing in the spinal cord and ascending to the brain, dilatation of the blood-vessels and lowering of the blood pressure. It is decomposed in the intestinal canal. 2. Sphacelinic acid causes gangrene—its most prominent property. Microscopic examination of the gangrenous parts shows a hyaline exudation on the walls of the smaller arteries, which almost wholly occludes their lumens. In rabbits, guinea-pigs, and cats no gangrene occurs, for the vessels of these animals do not give out a hyaline mass, but their walls degenerate, so that there result numerous small effusions of blood in the most various organs. The blood pressure rises, owing to contraction of the vessels. On the uterus this acid acts by causing contractions, and as a fact genuine tetanus. 3. Cornutin is the only energetic alkaloid in ergot. The ergotenin of Tauret proved to be without physiological effect. Cornutin acts powerfully in doses of $\frac{1}{32}$ part of a milligram. Frogs fall into a state of spastic rigidity lasting many days. The contractions of the uterus are not tonic but clonic. The blood pressure is raised and the vessels contracted.

In practice only preparations of ergot should be used which contain the two last principles, as ergotinic acid is useless.

NITRITE OF AMYL AS AN ANTIDOTE IN STRYCHNIA-POISONING (*Boston Med. and Surg. Journ.*, Nov. 20, 1884).—Dr. Hobart A. Dare has repeated the experiments of Gray to determine the value of nitrite of amyl in strychnia-poisoning. Gray, who used only two rabbits, injected hypodermically ten drops of the nitrite and $\frac{1}{2}$ grain of strychnia simultaneously, and obtained no decided symptoms, although $\frac{1}{4}$ grain strychnia alone caused death. H. used six rabbits, and found that $\frac{1}{20}$ grain strychnia caused death. Nitrite of amyl did not prevent a fatal issue, though it evidently prolonged life, and is capable of stopping a convulsion. He concludes as follows: 1st. Nitrite of amyl does prolong life in strychnia-poisoning, though its action is so fleeting compared to that of its adversary, that it can only be used to tide over the patient until more persistent remedies or antidotes, such as bromide and chloral, can be administered. 2d. That it cannot be used by inhalation with any chance of security from a fatal termination, owing to the facts regarding expiration before stated (spasm of respiratory muscles in expiration). 3d. The longer the nitrite be given after the strychnia, the less good will it do, *provided* the strychnia has already shown itself by convulsions or otherwise. This is because death is more apt to come before the nitrite can fully act. 4th. The nitrite has to be given so that its full physiological effect is constantly present. 5th. An injection of nitrite should be first given, and the patient be kept moderately under its influence till other remedies are obtainable.

MORTON PRINCE, M.D.

BOOKS AND PAMPHLETS RECEIVED.

In order to facilitate work in the Periscope departments, authors are requested to send *Reprints* of their articles to the editors or publishers of the JOURNAL.

The Surgical Management of Rhachitic Deformities of the Lower Extremities, by V. P. Gibney, A.M., M.D., Prof of Orthopædic Surgery in the N. Y. Polyclinic. (Reprint from *N. Y. Med. Journal* for Nov. 29 and Dec. 6, 1884.)

A Clinical Lecture on the Mechanical Treatment of Pott's Disease, by Charles F. Stillman, M.S., M.D. (Reprint from *Journal Am. Med. Association*, Jan. 31, 1885.)

Contributions to Physiology. From Private Physiological Laboratory at Easton, Pennsylvania, 1883–84, by Isaac Ott, M.D. 1. The Physiological Action of Convallamarin. 2. Intestinal Peristalsis. 3. The Splanchnics. 4 The Action of Certain Drugs upon Intestinal Peristalsis. 5. The Relation of the Nervous System to the Temperature of the Body.

State Provision for the Insane, by C. H. Hughes, M.D., St. Louis. (Reprint from *Alienist and Neurologist*, April, 1885.)

Cottage or Family System for the Better Treatment of the Insane. The Nature of Insanity: its Cause, Prevention, and Permanent Cure, by J. D. Rhymis. Cleveland, 1883.

The Family System as an Accessory Provision for our Insane Poor, by Henry R. Stedman, M.D., Boston. (Reprint from Sixth Annual Report of Mass. Board of Health, Lunacy, and Charity.)

Clinical Observations on the Blood of the Insane, by S. Rutherford Macphail M.D. Edin. (Reprint from *Jour. of Ment. Sc.*, Oct., 1884, and Jan. 1885.)

Deterioration of Vision in School Children, by S. O. Richey, M.D., Washington. (Reprint from vol. x. of Reports of American Public Health Association.)

Prof. A. Eulenburg; Zur Methodik der Sensibilitätsprüfungen besonders der Temperatursinnsprüfung. *Zeitschr. für klinische Medicin*, Bd. ix., H. 2.

Eulenburg : Ein Fall von Tabes dorsalis complicirt mit progressiver Muskelatrophie, *Berlin klin. Wochenschrift*, 1885, No. 15.

Prof. A. Eulenburg ; Ein Fall von fortschreitender musculärer Dystrophie (Hypertrophie mit Feltdegeneration und wachsartiger Degeneration au den Unterextremitäten. (Separat-Abdruck aus der *Deutschen med. Wochenschrift*, No. 12, 1885.)

Supplement to the Transactions of the Sei I Kwoi, or Society for the Advancement of Medical Science in Japan, Nos. 1 and 2, Jan. and Feb., 1885.

Massage : the Latest Handmaid of Medicine, by Benj. Lee, A.M., M.D., Ph.D., Philadelphia. (Extracted from Transactions of the Med. Society of the State of Pennsylvania for 1884.)

Tracts on Massage. Translated from the German of Reibmayr, with notes, by Benj. Lee, A.M., M.D., Ph.D. Philadelphia, 1885. I. The Art of Massage.

Clinical Illustration of the Value of Combining Motion with Extension in the Treatment of Disease of the Hip-Joint, by Benj. Lee, A.M., M.D., Ph.D., of Philadelphia. (Extracted from Trans. of Med. Soc. of State of Pennsylvania for 1884.)

Note sur la Cecité verbale, par le Dr. de Watteville à Londres. (Extrait du *Progrès Médical*, 21 Mars, 1885.)

Saint Bartholomew's Hospital Reports, vol. xx., 1884. Smith, Elder, & Co.

Transactions of the New York State Med. Association, 1, 1884.

Specialties and their Relation to the Medical Profession, by L. Duncan Bulkley, A.M., M.D. (Reprint from *Journal of Am. Med. Association*, Dec. 13, 1884.)

FOREIGN EXCHANGES.

Annales Médico-Psychologiques.
Archives de Neurologie.
Archivio di Psychiatria Scienze.
Archiv. fuer Anatomie u. Physiologie.
Archiv. fuer die Gesammte Physiologie der Menschen (Pflüger).
Archiv. fuer Psychiatrie und Nervenkrankheiten.
Allgemeine Zeitschrift für Psychiatrie.
Berliner Klinische Wochenschrift.
Brain.
British Med. Journal.
Canada Medical Record.
Canada Med. and Surg. Journal.
Centralblatt für d. Nervenheilk., Psychiatrie, etc.
Centralblatt für Klinische Medicin.
Centralblatt für Chirurgie.

Deutsche Med. Wochenschrift.
Deutsche Arch. f. Geschichte der Medicin.
Deutsche Medizinal Zeitung.
Dublin Journal of Med. Sciences.
Edinburgh Med. Journal.
L'Encéphale.
Gazetta degli Ospitali.
Gazette des Hôpitaux.
Hospitals-Tidende.
Hygeia.
Irrenfreund.
Journal de Médecine et de Chirurgie Pratiques.
Journal of Mental Sciences.
Journal of Physiology.
Lancet.
London Med. Record.
Medical Times and Gazette.
Mind.
Neurologisches Centralblatt (Mendel).
Nordiskt Medicinskt Arkiv.
Practitioner.
Progrès Médical.
Revue de Médecine.
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Rivista Clinica.
Rivista Sperimentale di Freniatria.
Schmidt's Jahrbücher.
Lo Sperimentale.
L' Union Médicale.
Upsala Lakareforнings Forhandlinger.

DOMESTIC EXCHANGES.

American Journal of Insanity.
American Journal of Medical Sciences.
American Journal of Pharmacy.
American Psychological Journal.
Analectic, The Medical.
Annals of Anatomy and Surgery.
Archives of Ophthalmology.
Archives of Otology.
Boston Med. and Surg. Journal.
Buffalo Med. Journal.
Chicago Med. Journal and Examiner.
Cincinnati Lancet and Clinic.
College and Clinical Record.
Detroit Lancet.
Index Medicus.

Journal of Physiology.
Journal of American Med. Association.
Maryland Med. Journal.
Medical and Surgical Reporter.
Medical News and Abstract.
Medico-Legal Journal.
Nashville Journal of Medicine.
New England Med. Monthly.
New Orleans Med. and Surg. Journal.
New York Medical Abstract.
New York Med. Journal.
New York Med. Record.
Pacific Med. and Surg. Journal.
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San Francisco Western Lancet.
Sanitarian.
St. Louis Courier of Medicine.
St. Louis Medical and Surgical Journal.
Therapeutic Gazette.
Virginia Medical Monthly.
Walsh's Retrospect.

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Original Articles.

HOW A LESION OF THE BRAIN RESULTS IN THAT DISTURBANCE OF CONSCIOUSNESS KNOWN AS SENSORY APHASIA.[1]

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WHEN Broca demonstrated that an injury to the base of the third frontal convolution on the left side of the brain caused a loss of the power of speech, the first step was taken towards the exact localization of the functions of the brain. But though all subsequent experience has confirmed Broca's discovery, more recent clinical observation has shown that this region is not the only one the integrity of which is essential for the function of language; but that the destruction of other regions, as, for example, the Island of Reil, the first two temporal and other convolutions, result in the impairment of this faculty. But, on the other hand, while it has been shown that this is the case, it has also been determined that there are differences in the symptoms presented according as the impairment of speech is due to an injury to Broca's convolution, or to some other spot. In other words, all aphasia is not the same, but that the faculties retained and lost by

[1] Read at the annual meeting of the Massachusetts Medical Society, June 9, 1885.

aphasics differ; some for example can perfectly understand when spoken to, but cannot articulate or write; others can articulate, but cannot understand a single spoken word though they hear perfectly all other sounds; others can both understand spoken language and speak, but their speech is unintelligible; and so on. Various attempts accordingly have been made to construct a number of different types of aphasia, to which all cases may be more or less approximated. To understand the phenomena of aphasia it is necessary to carefully study the faculty of language as possessed by a normal individual. I have no intention of doing so here, further than to point out that for the complete faculty of speech, which is a complex function, the co-operation of at least three different functions is requisite. In the first place, it is necessary to be able to hear the sounds of words, internally as well as externally; for a person may be deaf to *words*, though he has most acute hearing for all other sounds. Secondly, there must be a sufficiently normal intellect, in order that words may be combined with ideas; and thirdly, we must be able to co-ordinate the motor impulses to the muscles of the apparatus of speech. Clinical observation has further shown that these different faculties are distinct and separate, and that one can be lost while the other two are retained; but that the impairment of any one, whether of the acoustic, the motor, or the intellectual faculties, results in an impairment of speech, or aphasia. We are thus compelled to distinguish different centres in the brain corresponding to each of these functions—namely: an acoustic centre where the sounds of words alone arise; a motor centre, where the impulses to the muscles of speech are co-ordinated; and a larger and diffuse centre for the intellect proper, where the word-sounds are associated with ideas. As the impairment of the intellectual centres comes within the domain of insanity it need not concern us further here. When the motor centre is affected, the resulting disturbance of speech is known as *motor*, *ataxic* or *Broca's aphasia;* when the acoustic centre is at fault, as *sensory* or sometimes *paraphasia*. These are two of the principal forms of aphasia. Other forms have

been distinguished, but it is not necessary for my purpose to consider them here.

Motor aphasia is the most common form. I will not trespass on your time by narrating cases of this well known type, but will briefly mention the following case, in order that the type may be contrasted with the second variety.

A young woman, Hannah D., had an attack of apoplexy two years and five months before I saw her, and following an attack of rheumatism and probably endo-carditis. At the time of my examination the right hemiplegia, which at first had existed, had entirely disappeared. Aphasia only remained. The only improvement of speech since the attack consists in the ability to say "No." She cannot say "Yes." She can understand perfectly when spoken to. She can write her name but nothing more. She can read to herself, but not aloud. She cannot repeat spoken language.

In this case there was:

LOST:	RETAINED:
a. Volitional speech,	*f.* Understanding of spoken language,
b. Repetition of words,	*g.* Understanding of written language.
c. Reading aloud.	
d. Volitional writing,	
e. Writing to dictation.	

(She could write to dictation "Boston" as far as "Bo," but not Massachusetts or any thing more.)

Various schemes have been constructed to diagrammatically represent the mechanism of the different forms of aphasia. I may say here that, in my judgment, none of the many thus far constructed correctly accord with all the phenomena of aphasia, though the one given by Lichtheim is probably in the main correct. I have drawn on the board so much of it as is necessary for the purposes of this paper. This is probably correct so far as it goes. The intention is merely to schematically represent the different centres concerned in speech and their connection, without reference to what portion of the brain they are located in.

a. is the auditory nerve which carries acoustic impressions to the centre A., where the word-sounds arise. B. is the centre for the intellect proper. M. the motor centre, and m. the motor nerves. A. B., B. M., and M. A. are commisural fibres connecting these centres.

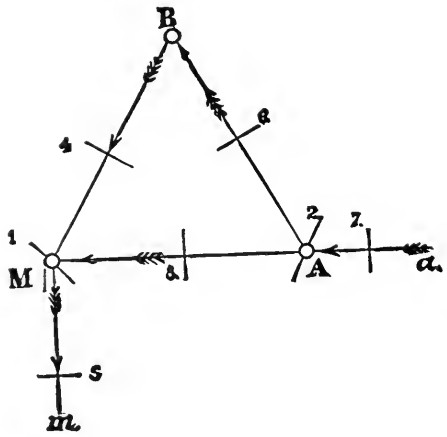

Fig. 1.

From a study of this scheme, if correct, it is apparent that seven different types of aphasia can *theoretically* occur, according as there is an injury to the centres A., B., M., or their connections.

Lichtheim claims to be actually able to distinguish clinically these seven types. Be that as it may, the scheme enables us to understand the mechanism of the commonly recognized forms. In the motor form, of which I have just spoken, the centre M., where the motor impulses to the muscles are co-ordinated, is destroyed. Hence ideas in B. cannot resolve themselves into words. On the other hand we can understand how such a patient can readily understand when spoken to, as the auditory centre A., the intellect B., and the connection A. B. is intact. He might be able also to think in words, to write (?) and read (for simplicity's sake I have not represented the centres for the latter two faculties), though he could not repeat words dictated. If the centre A. alone is destroyed we have the second form of aphasia I spoke of, namely, sensory aphasia. In such a case, though the patient can *hear all other kinds of sounds*, he is absolutely deaf to words. As B. and M. are intact the faculty of volitional speech is retained, but it is so modified that the patient uses the wrong words, and puts together syllables belonging to different words in such

a way as often to make his sentences unintelligible. He has what is called paraphasia. He can properly co-ordinate the motor impulses so as to pronounce all the sounds of a language, but words and syllables are combined in an unintelligent manner, owing to the defect in the word-consciousness at A.

The following case of sensory aphasia has been recorded by Wernicke:

> The patient was an old woman who was thought to be insane, and accordingly sent to the insane asylum. There it was found that she was perfectly sane, but, though her hearing was acute for sounds, as tested by a watch, *she was stone deaf for words*—that is, she understood absolutely nothing that was said to her. Although she could speak (thereby differing from the motor aphasic), her language was often meaningless, from the fact that she inserted wrong words in her sentences, and often distorted and senseless words. The meaning of her language, however, could be unravelled, and was found to be rational.

It is this form of aphasia, where the consciousness of the sound of the word is lost—sensory aphasia—which I propose to more fully consider here to-day. That there is a centre in the brain where the sound of the word is generated there can be no doubt. The case which I have just narrated to you conclusively shows this. This centre is distinct from that one where the the motor impulses, which control the articulation of words, originate, and the destruction of which results in ataxic or motor aphasia. In the diagram these centres have simply been indicated with their connections, without attempt to define their actual locations in the brain itself. In regard to their actual locations we are not yet prepared, perhaps, to express an opinion for all the centres. The motor centre without doubt is situated in the posterior third of the third frontal convolution, known as Broca's convolution, and its neighborhood, in the region marked A. (Fig. 2). Pathology has clearly demonstrated this. The auditory centre, on the other hand, is less firmly established, though there is reason to believe that it is in the neighborhood of the Sylvian fissure in the first temporal convolution.

Another case given by Wernicke points to this fact. It was that of a woman who was supposed to be crazy and

deaf, but was found to be also suffering from word deafness and paraphasia. At the autopsy there was found a thrombolic softening of the first and of a great part of the second left temporal convolution (Fig. 2, shaded portion).

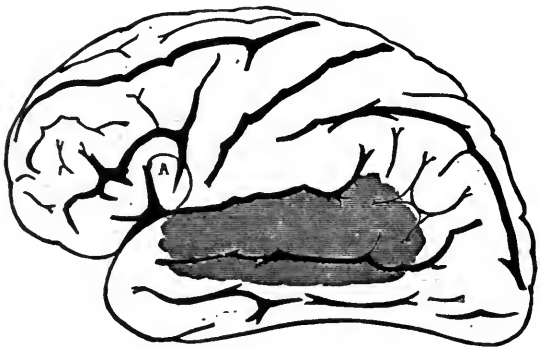

FIG. 2. (After Ferrier.)

Now, the question which I am coming to is this: What do we mean by a centre for speech? How does it happen that a destruction of this centre causes a loss of the power of speech, and in particular a loss of the power of hearing words? In answer, you say that here in this temporal convolution is the spot where the word-sounds are generated, and when this spot is destroyed, the apparatus is destroyed which generates the word-sounds. This is what is implied or hinted at in much of the language of medical text-books and periodical literature. If you will pause for a moment to reflect you will perceive that such language means either very little, or something which is so carelessly expressed as to border on nonsense. Can you conceive of the brain generating a sound as a gas machine generates gas? If you can, what manner of thing is the sound, and what becomes of it after it is generated? Any notion of word-sounds, or any other form of conciousness being a *product* of the brain, is too crude to bear analysis. The moment you try to picture the process to your mind you are lost in a sea of contradictions.

If one is more exact in the use of language, he says that the acoustic centre for words is the spot where the activity

of the brain is *accompanied* by the auditory sensations of words, and the destruction of which centre results in the loss of the faculty of understanding language, or thinking in words internally. But again it may be asked: *How* does the destruction of the brain end in loss of word-sounds? and *why* should the sounds be gone simply because the brain is injured? You have broken up a circumscribed piece of the brain; but do you see any likeness between that piece of brain and the sound of a word? The sound is a form of our consciousness; why then should it not exist though the brain be broken? You may answer that it is the function of this part of the brain to—— Do what?—*produce* word-sounds? This brings us back to the difficulty of conceiving of a sound as something produced. Can you not conceive of your having sounds without a whole brain? Why, then, I repeat, should the consciousness of words be gone because a spot of brain is broken up? Examine this piece of brain as much as you please. Bring your microscopes to bear; dissect it till you have made out that it is made up of cells and nerve-fibres, of connective tissue and blood-vessels; analyze it in your chemical laboratory till you discover it is composed of protoplasm, of myelin, of fibrin, and what not. Increase the power of your lenses till you see the very molecules of protoplasm as they beat against one another in the myriads of cells of the brain, and after you have done all this, have you found any where any thing like a sound?

But sound is the *function*, you answer, of the brain. Well, look again through your microscope. Watch the blood course through the vessels; watch it transude through the walls of these vessels into the cells; watch it transude back again after its chemical constitution has been metamorphosed. Look into the cells themselves, and watch the very molecules as they vibrate in unison; watch them, as the vibrating wave passes along the ingoing nerves into the cells, and watch how the wave passes out again as the molecules in the outgoing nerves take up the motion. Watch again the molecules as they combine and recombine in new proportions with the new food brought by the blood, and

see others cast out as effete products of metamorphosis. You have now seen the *function;* have you come across any thing like the sound of a word? Where then does this sound come in? It is this question which I have brought before you for your consideration to-day, and which I shall endeavor to answer.

Let us look a little more closely into what happens when an artery, for example, breaks in the brain. The cortex of the brain, as you know, is made up of cells and fibres. As a result of the rupture, the cells are disintegrated and the fibres severed. Along the latter neural currents are no longer carried, and in the cells nervous "force," so-called, is no longer generated,—the molecular vibrations which accompany a state of consciousness, as the sound of a word, can no longer occur.

If we had examined more minutely the cells before they were broken up, we should have found that they are principally made up of nervous protoplasm, a very complex substance. We know that it is made up, like all material substances, of molecules, the smallest particles into which a substance can be divided without changing its composition. The activity of a nervous cell consists in the vibration of its composite molecules. It is this activity which accompanies the word-sound.

But still in viewing this activity, we have not yet got any nearer to the word-sound we are in search of. Let us go a step farther and examine what we mean by a molecule, and by molecular vibrations. A molecule is something which we picture to ourselves as having a certain shape and size; if, in imagination, we press it between our fingers, we perceive it has a certain density and hardness; we must regard it also as having a certain color similar to that of a large mass of the same substance. Furthermore, when acting in conjunction with other molecules we know it has a variety of physical and chemical properties. Its properties, as a whole, may be described as the resultant of the properties of its constituent atoms.

But when we say that a molecule of protoplasm is of a certain color, shape, and size, etc., etc., what do we mean

by this? When we say that the molecules of protoplasm vibrate with one another what manner of thing is this vibration? There is more in this question than seems at first sight. To answer it we must turn to our physiology, and inquire how it is that we see objects, and how it is that we recognize a molecule to have color, for example. What we shall find to be true of seeing, will also be found to be true of all our other senses.

I am going to represent here on this blackboard by this star-shaped figure (Fig. 3, *a*) a molecule of protoplasm, which we will suppose is in a cell in the brain *A*.

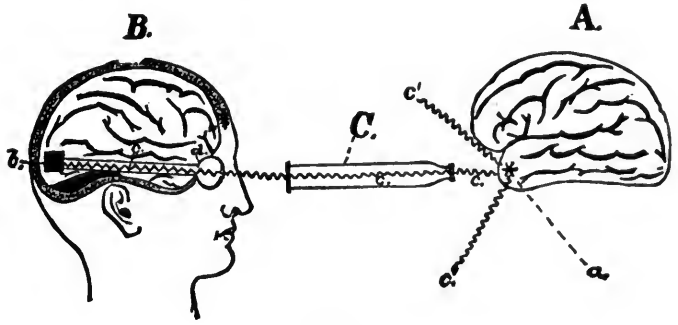

FIG. 3.

We will imagine a person, *B*, inspecting it through the microscope, *C*. The observer makes out that there is something there *that is octagonal in outline, and blue in color*. What is the physiological process by which he sees all this? Physics and physiology answer thus: The vibrating waves of the ether, *c'*, *c'*, coming from the sun are reflected, *c*, *c*, *c*, through the microscope, *C*, toward the eye, of the observer, *B*. After passing through the cornea, lens and vitreous humor of the eye they impinge upon the retina, *d*. If we pause a moment to consider what has occurred we may be surprised to find that nothing like color, or shape—indeed, nothing like a picture of a blue octagonal molecule, thus far exists. So far the only phenomena presented are oscillations of the molecules of ether between a point, *a*, and the retina; but now the motions of the etherial molecules are transmitted to the retina, and to the molecules of

the nervous protoplasm in the optic nerve. Along the optic nerve, along its prolongations, deep into the brain, the motion is continued, till the waves reach the occipital lobe of the brain; here the cells of the cortex are at last reached, and to the molecules in these cells the motion is communicated. Even then, till we reach these cells, nothing like color has appeared. Sever the lines of communication at any point between *a* and the cells of the cortex and nothing like color exists, though the molecules of ether around *a* are still in agitation. But at last the motion has been transmitted to the cells in the cortex of the brain, and now, for the first time, color arises, and the sensation of blueness, *b*, is excited. The observer looking through the microscope is conscious of blueness; but now an artificial device comes into play, and the observer says that the molecule of protoplasm *a* is blue. But we see at once that this is only an artifice, the reasons for which it is not necessary for us to inquire into here. It is a fact that the blueness is only in the mind of the *observer*, not in the molecules in the brain of *A*. But how about the other properties of this molecule? How about the shape? A moment's reflection will show you that this, too, exists only in the mind of the observer: and is produced there by rays of undulations of ether being transmitted from each point of the molecule (*a*), and falling upon the retina, exciting there again as with color, vibrations amongst the molecules of the optic nerve; as before, no picture of the molecule has yet arisen, nor again does it arise till the motions in the nerve have been communicated to the cells of the cortex where, for the first time, a picture of the molecule, consisting of a certain outline and surface of an octagonal figure *b*, is formed.

What is true of color and shape is also true of hardness and the other qualities possessed by the molecule. Hardness is only a sensation derived by touch, and also has its origin in the brain of the observer. But after we have abstracted these qualities from the molecule what remains? That there is something there which excites these sensations in us there can be no doubt. Something remains be-

hind; what it is we do not know. But there is something there; some unknown force or activity you may call it, but its nature is unknown. This unknown something we call the *Reality* of the molecule, because it is the molecule as it really exists independent of the sensations of color, etc., it excites in us. It is called the molecule-in-itself, or the Reality. I want you to bear in mind what I have endeavored to explain is meant by the Reality of the molecule, in order that what will follow may be understood.

We must still go one step farther. We have learnt what is meant by molecules. We have learnt that the "Realities" of molecules are unknown "forces."

You will remember that it was said that when the molecules in the cells in the temporal convolution were set into vibration, one with another, that the sound of a word arose in consciousness. Now what is meant by "vibration of molecules"? To answer this we must again turn to physiology. Turning again to our diagram, it will be perceived that just as the *color* of a molecule exists only in the mind of the observer, so the *vibration* of these molecules is likewise only a sensation, and this sensation also occurs in the observer's brain, when he brings his microscope to bear on the cells in the convolution. This sensation, called a vibration, does not occur in the temporal convolution of A, but in the second person's mind (B). It is excited in B by something that occurs in A, just as the sensation blue is excited by that something called the Reality of the molecule. What is this something which creates in the observer the sensation of molecular undulations? This in turn is the *Reality of the undulations.*

Now the nature of the Reality of the molecules we admitted was unknown to us; is the Reality of the undulations of the molecules also unknown to us? My answer is, "No." It is known to us. What is it then? *It is the word-sound* we have been in search of. The conscious state which we call the sound of a word is the Reality of the vibration of the molecules in the cells of the first temporal convolution. Such is the explanation which I desire to present to you. The data upon which this conclusion rests I cannot enter

into here. I have already done so at length in another place, and must refer such of you as desire further proofs of this assertion to that work.[1]

My intention is to offer you that explanation which in my judgment best explains how it is that when the first temporal convolution is destroyed word-deafness results. When this injury is inflicted, these molecular vibrations, and of course the Realities of these vibrations, cannot occur.

Those of you who have followed me thus far must have already perceived that the explanation, which I have endeavored to make clear, is not limited to the single question of aphasia, but is far more wide-reaching and general in its principles. It embraces the great question of the relation of the mind to the brain, and explains the connection between the two. It shows how consciousness arises as the resultant of material factors, and how an impairment of the cerebral functions means also an impairment of consciousness. It shows how the physiological activity of the brain and consciousness are one and the same thing, and that any imperfection in the physical working of the former, means an imperfection of the mind, and an imperfection of the mind means an imper fection of the brain. We may say with certainty that wherever we meet with an impaired mind, whether that impairment be either only temporary or permanent, there is also some derangement in the physiological working of the brain. This theory therefore assumes a practical value.

Some may be disposed to think that though we may have found a mode of explaining the relationship between the mind and the brain, still it is only a theoretical question without practical utility. To this I wish to make emphatic objection. In the first place it is a *physiological* question, and therefore one the elucidation of which enables us to understand the *modus operandi* by which disease of the brain is manifested in a disordered mind; and any thing which does this must aid us in the comprehension of mental pathology. In proof of this I have only to allude to the general ideas widely prevailing regarding certain functional diseases, such as hysteria.

[1] "The Nature of Mind and Human Automatism." J. B. Lippincott Co., 1885.

In former times, not so many centuries ago, either, the unfortunate person afflicted with insanity was said to be possessed by an evil spirit, and was loaded with chains, cast into a cell, and sometimes even punished with tortures that the evil one might be driven out. Improved knowledge in physiology and pathology of the body has resulted in the scientific and humane treatment of the present day. But something of the old ideas still clings to hysteria. An invalid, usually a woman, complains of pain, of suffering, of disordered functions of every form. Her character and disposition are changed from what they were. The physician examines her, finds no coarse anatomical lesion to account for the symptoms, and turns away with the remark: "It is only hysteria." The patient says she is in pain. The physician says again, sometimes even contemptuously: "It is only hysterical." And every one around the patient says nothing is the matter. How different all this becomes when we regard every symptom, even the thought which prompts a patient to exaggerate her symptoms, as synonymous with disordered physiological activity! If we bear in mind that every symptom in functional diseases of the nervous system means disordered activity of the cells and fibres; that every deviation in the mental activity of the patient, every change of disposition and character, even the absence as well as the presence of former modes of thought, means an imperfect working of the brain, whether by the inactivity of some cells or the too great excitation of others, we shall better comprehend the pathological condition of our patient.

If space permitted, it would be interesting to notice how this conception of the mind and the brain makes thoroughly comprehensible many facts hitherto inexplicable, and often regarded as mysterious; facts which because inexplicable are oftentimes received with credulity. I refer to the influence of the mind upon the body both in health and disease. The influence of the mind in modifying the physiological processes of the body is a well-known fact; that it can also modify pathological processes of minor grades is a fact, which, though tardily acknowledged by the profession, is from time to time made use of by empirics and im-

postors for their own material advantage. The well-known metallic points of Perkins, which nearly one hundred years ago reaped such golden harvests and which now adorn the wall of our medical library, as a reminder not less of the power of the mind over bodily processes than of the credulity of human nature; the bread pills of our fathers; the *placebos* of modern medicine and the epidemic mind-cure of to-day, which like the dancing mania of the Middle Ages, threatens to entice the whole population into its folds, all attest the power of the mind upon the body. A knowledge of the nature of the mind and its relation to the body allows the intelligent physician to distinguish the true from the false, to extend the boundaries of mental action to the farthest limit of its own domain, as well as to set restrictions to its encroachments made by shallow and credulous believers.

In attempting to elucidate the connection between aphasia and the anatomical lesion of the brain, I have thought that the time has come when the physician should not limit his investigations to mere broken fibres and degenerated cells, on the one hand, nor to mental symptoms, alone, on the other, but should ask the nature of the bond between them.

PARONYMY VERSUS HETERONYMY AS NEURONYMIC PRINCIPLES.

PRESIDENTIAL ADDRESS AT THE ELEVENTH ANNUAL MEETING OF THE AMERICAN NEUROLOGICAL ASSOCIATION, JUNE 18, 1885.

By BURT G. WILDER, M.D.

THE double honor conferred upon me last year, in your selection of President and of Chairman of the Committee on Encephalic Nomenclature, I have ventured to interpret as a flattering encouragement from some, as a courteous challenge from others, to do my best—or worst—to win from this Association an acknowledgment of the existing imperfections of neurological language and a fuller consideration of the plans for its improvement which I have advocated during the past five years.

The need of some improvement in the nomenclature of the brain is practically admitted by all who, for a known part, deliberately propose a new name, or select an old name to the exclusion of others. By a few writers also it has been explicitly stated.

According to Pye-Smith (1, 162),[1] the "nomenclature of the brain stands most in need of revision."

One of the greatest of living anatomists makes the following distinct suggestion: "Whoever will carry out the application of neat, substantive names to the homologous parts and structures of the encephalon, as they may be ascensively determined, will perform a good work in true anatomy" (Owen, A, I, 294, note).

[1] For the mode of reference adopted in this article, see the Bibliographical List at its close.

So far as I am aware, neither the beginning nor the continuance of my own efforts has depended upon the precept or the example of others. Partly in private study, but yet more in laboratory and lecture-room instruction, there was gradually forced upon me the conviction that the current nomenclature is, to a large extent, an obstacle rather than an aid to the advancement and dissemination of knowledge concerning a complex organ; that, in short, excepting under unusually favorable conditions, the average student rises from a neurological discourse with the belief that, unless his organ of thought is gravely disordered, most of the terms employed are too long, and some mean the reverse of what they seem to express. With regard to the encephalic cavities in particular, I reiterate what I have said before, that every student would save time and exasperation of mind if the incongruous and misleading, quasi-descriptive terms, *first*, *second*, *third*, *fourth*, and *fifth ventricle*, could be replaced by totally meaningless, but easily remembered Chinese monosyllables, like *pran*, *pren*, *prin*, *pron*, and *prun*.

Erelong I became absolutely incapable of using the current names without hesitation and a desire to apologize for them, which seriously diminished the clearness of my thoughts and the readiness of my speech. This was notably the case in dealing with published figures and with the diagrams which students were required to make from their own preparations; according to the plan usually followed, there neither was nor could be uniformity in the names, much less in the abbreviations set against the parts.

Impelled, then, toward some change for the better, not by a desire to carry out an ideal scheme of reform, but by a wish to economize time and lighten the labors of earnest students, I have probably given to the nomenclature of the brain more attention than has been devoted to it by any other English-speaking anatomist. I say *English-speaking* to forestall comparison with two French writers whose efforts to modify nomenclature in accordance with preconceived plans have met the fate which sooner or later befalls innovations based upon theory rather than upon practical

experience. Chaussier's idea that the name of each muscle, for example, should accurately indicate all its relations, led him to frame a myonymy which is not only inapplicable to the same parts in many animals, but so ponderous as to be useless; and although Sarlandière's names for the few parts of the brain discussed by him are rarely more objectionable than, for instance (as translated), "medio-cerebral tubercula quadrigemina," yet hardly the most perfect nomenclature could be seriously considered when heralded by a "Preliminary Observation" like this: "I have perfectly satisfied myself that a knowledge of anatomy in all its parts, and even in its details, may be acquired in fifteen lessons only, each of two hours duration."

So far from assenting to the foregoing claim, I hold that there is no short, easy, or "royal road" to the anatomy of the brain; at the best it is long and hard; but I believe that it need not continue to be, as in the past, so perplexingly crooked and so full of verbal pitfalls and obstructions.

My general object has been to introduce a system of neuronymy[1] which *with a minimum of disturbance in the existing order of things, may insure greater accuracy and brevity, and facilitate the acquisition and communication of knowledge between neurologists of all nations, to a considerable degree in the present, and to a much greater degree for our successors.*

More specifically, the principal modifications proposed by me are indicated in the following extract from my first publication on the subject, a paper read at the meeting of the American Association for the Advancement of Science in Boston, August, 1880, and reported in the *Medical Record*, September 18, 1880 (41, 380):

"*It is proposed to discard all vernacular names; to make a selection of the shorter technical* [*classical*] *ones; to abbreviate some by the omission of unessential words, and others by the substitution of prefixes for adjectives.*"

[1] The usefulness of *onym* (Gr. ὄνυμα, Latin *nomen*, a *name*) and its compounds in the exact discussion of nomenclatural questions was recognized by me in 1881 in the employment of *toponymy* and *organonymy*, and has been illustrated since by the introduction of a set of terms with especial reference to zoölogical writings by Dr. Elliott Coues (3). Most, if not all, of Dr. Coues' new words are equally applicable to anatomical nomenclature, and some of them (*mononym*, *polyonym*, etc.) are herein employed.

The application of these propositions has been hindered by the extraordinary number of recorded neuronyms to be dealt with. In contributing toward a new Medical Dictionary under the editorship of a learned member of the profession, I have obtained, during the past year, an alphabetical list of nearly all the names which have been applied to the parts of the central nervous system, together with at least one exact reference to a place of publication.[1] Allowing for some omissions and duplicates, in round numbers the names are as follows: Latin, 2,600; English, 1,300; German, 2,400; French, 1,800; Italian and Spanish, 900; total, 9,000. Upon the assumption that the number of parts designated by these names is not more than 500, (in reality it is considerably less,) it is evident that there are now on record many superfluous names in each language. Even if we eliminate those which are generally admitted to be obsolete, there remain numerous synonyms which are used occasionally or by individuals, and with which, therefore, the reader must be more or less acquainted.

Reserving for another occasion the consideration of how to dispose of the vast number of useless and worse than useless neuro-synonyms, I ask your attention for a moment to that feature of the names approved by me which seems to me most important and commendable.

From the lists of the names of the macroscopic parts of the brain published in 1880, 1881, 1882, and 1884,[2] it will be seen that:

(A.) Most of the names selected or introduced by me consist of a *single word each;* they are monomials, or, better, *mononyms.*

(B.) This feature of mononymy particularly characterizes the terms which are *most frequently employed* in anatomical and physiological discussions.

(C.) Many of these mononyms designate parts which constitute natural or conventional groups, and differences in relative position are indicated by the topical prefixes, *præ*, *post*, *supra*, *sub*, *medi*, etc.

[1] The task proved so unexpectedly great as to be incompatible with my regular duties, and most of the work was done by my wife.

[2] A partial list will be sent on application.

The advantages of mononyms over polyonyms were stated by me a year ago as follows: (1) brevity; (2) flexibility or capacity for inflection; (3) adaptation to uniform abbreviation; (4) capacity for assimilation into other languages. To these may be added, as closely connected with the last, that the employment of Latin polyonyms, even when familiar, imparts to a sentence a decidedly un-English look by reason of the reversed relative positions of the adjective and substantive.

Although my own convictions as to mononyms were formed independently, I think that the honor of enunciating the principle and carrying it into effect to a considerable extent must be ascribed to Professor Owen. In addition to *præcava*, *postcava*, and other combinations for various organs, Owen's names for the cerebral fissures and gyres are uniformly mononymic, as will be more fully shown at this meeting.[1]

The superiority of single words over names of two or more words is distinctly stated by Pye-Smith (1, 155), but that writer, so far as appears, merely proposed to select the few already in existence, *pons*, etc., which would leave the vast majority of neural parts still burdened with names, both Latin and English, of two or more words each.

With this preliminary I pass to the proper subject of the present address. In the lists already mentioned, in the "Anatomical Technology," and in all but recent papers, the neuronyms are Latin in form, many of them obtrusively so; *the vocabulary is essentially Latin, and not English.* This feature is particularly noticeable in the terms proposed for the encephalic cavities, *mesocœlia*, etc., and occasioned the comment in one of the first notices of the new nomenclature (*The Nation*, April 21, 1881) that "some of the terms savor of pedantry."

At that period my mind was so fully occupied with other and, I think, more essential features of the system, that the above remark made little impression, and the objection seemed, at most, slight in comparison with the objections to any perpetuation of the old methods. By degrees, how-

[1] In a paper (64) on the cerebral fissures, etc.

ever, I realized that to think and to speak, and especially to learn new things, is easier in one's own language than in any other; that upon a professedly English page any thing but English is objectionable, perhaps not always unavoidable, but, at best, a necessary evil; and that a vocabulary which, to the apparent objection of novelty, added the real one of exoticism, might not secure an impartial consideration of its merits in other respects.

Was it, then, necessary to return to the time-honored methods already in use?

These methods are two, characterized, the one by Latin phrases like *torcular Herophili*, *corpora quadrigemina*, and *iter a tertio ad quartum ventriculum*; the other by English translations thereof, such as the "wine-press of Herophilus," etc. The former of course, are open to the same objection of pedantry as the names proposed by me, with the disadvantage of length to offset our familiarity with some of them. The latter are, at first sight, more acceptable, especially to the laity, but I hope to be able to show that the systematic employment of such terms is undesirable from several points of view.

For convenience, in the present discussion vernacular names which are more or less precise translations of Latin names, or of names in any other language, may be called *heteronyms*, from the Greek ἑτερώνῡμος; and *heteronymy* may be used either for the relation between such names, or for the system according to which they are employed or advocated.

Most English heteronyms, or vernacular translations of Latin names, are open to one or more of the following objections: literal inaccuracy, length, ambiguity, and lack of dignity. Length may be primarily a feature of the Latin name, but this makes the English no more acceptable. The reference to the mesocœle as "the aqueduct of Silvius, or, as it is better to call it, the passage from the fourth to the third ventricle," is surely the very apotheosis of heteronymic prolixity.

Heteronyms are apt to be ambiguous or misleading because the natural inference is that they are literally correct.

The swimming sea-turtle and the flying pterodactyl are easily accepted as *reptiles*, but they could hardly come under the vernacular equivalent, *creeping things*. No one objects to including the lamprey and lancelet under the vertebrate branch, but when the name "back-boned animals" is applied to them, one feels obliged to explain that they have neither backbone nor any other bone in their bodies. So with the brain; *genu*, *callosum and vermis*, are accepted in a conventional sense, whereas *knee*, *hard body*, and *worm* impress one as unnecessarily insisting upon features which are either non-existent or common to other parts. The rendering of a German designation of the pyramid as "anterior spinal column" (Putnam, A, 719) is perhaps as good an illustration as could be desired of the liability of heteronyms to be misleading.

Similar examples of the intrusive inaccuracy of literal translation have been furnished in substituting for a word having a conventional significance another which is synonymous only in certain respects. The grateful Frenchman's adjuration that God might pickle (preserve) his benefactor, had an exact parallel in the written answer of one of my students in Hygiene to the question respecting a certain mode of resuscitating the drowned: unmindful of the purely arbitrary use in anatomy of the adjective *false* as applied to the ribs not directly connected with the sternum, and thinking of the reverse of *real* hair and teeth, he recommended that pressure be applied to the "artificial ribs."

It is but a short step from heteronyms which are simply too long or too bald to such as fall but little short of being ridiculous. *Infundibulum* may mean funnel, and *thalamus opticus*, optic bed, but the terms are not attractive, and there seems to be no more reason for employing such homely vernacular phrases than for translating *Cuvier* into literal English and alluding to the great French naturalist as the Baron Wash-tub.

Similar difficulties in the way of systematic heteronymy apply to other languages in greater or less degree. Moreover, there is no likelihood that a name in one language

will suggest the corresponding one in another, or that either will suggest the Latin name; and there is much less probability that any two anatomists, even of the same nationality, will employ identical abbreviations. The chances are, indeed, that the same anatomist, upon the same plate, or even upon the same figure, may use abbreviations signifying in some cases Latin names, and in others vernacular names of an entirely different etymological character. For example, in Leuret and Gratiolet's Atlas, pl. xviii., fig. 2, *commissura anterior* and *tænia semicircularis* are indicated by *c. a.* and *t. s.*, while in close proximity are *c. o.* and *p. v.*, answering respectively to *couche optique* and *pilier de voute.*

Keeping in mind, then, the general object of reconciling the desire of every one for words in his own language with the preference of the professional anatomist for technical terms with which he has become familiar, or which he finds to be more exact, I reached the conclusion that the chances of their prompt and general acceptability would be materially enhanced by presenting the *technical, Latin names*, so far as possible, in *an English dress*, or with a *vernacular face* and *aspect.*

Lest it might appear that this idea of Anglicizing the Latin names is hasty and ill-considered, let me call your attention to publications in which it is more or less distinctly enunciated or carried out.

The paper on "Encephalic Nomenclature," (57) read before this Association a year ago, gave, as a chief advantage of single-word names, that "they are *assimilable*, or readily adopted into any language using the Roman alphabet"; in many cases (*fornix, calcar, delta, callosum*, etc.), no change is required, at least for English users; with others (*commissura*, commissure, *pyramis*, pyramid, *mesocœlia*, mesocœle, *hippocampus*, hippocamp, etc.,) the changes are so slight as to mislead none. In the "Cartwright Lectures" for 1884 (56) many of the names were Anglicized. More recently (63) these English forms were systematically employed, and special attention was asked to the case of the frequently recurring names for the brain (encephal) and spinal cord (myel).

Upon the present occasion I desire to set forth the char-

acter of the proposed compromise between the purely classical and the strictly vernacular tendencies of nomenclature, to formulate its rules and conditions, to assign it a name, and to show to what extent it has been, or may be, applied to neuronymy.

The Latin *canalis* may be rendered into English either by the definitions *water-course*, *aqueduct*, *tube*, *trough*, etc., which mean the same thing, but which have no kinship or resemblance to the word *canalis*, and, according to the definition framed above, are simply heteronyms; or, by the English *canal*, which not only means the same thing, but is practically the same word in an English dress; the Italian word is *canale*, but in German, French, and Spanish it is still *canal*.

All of these words are, as it were, geographical varieties of the Latin *canalis* and of one another, sometimes recognizable as belonging to one country rather than to another by their spelling, sometimes only from their context or pronunciation.

What name shall be applied to the relation between these words? Not to weary this Association with etymological details, suffice it to say that, after inquiry and correspondence extending over several months, I have failed to find in actual use any word, in any language, which seems to have been framed or employed with special reference to this particular point. The natural correlative of *heteronymy* is *homonymy*, and *homosynonymy* early occurred to me. But the former has been used hitherto exclusively of words having different significations, while *synonymy* is expressly restricted in its application to words in one and the same language. When it seemed almost inevitable that a new term should be coined, my colleague, Prof. Flagg, made the timely suggestion of *paronymy*, from the Greek *παρωνυμία*, the formation of one word from another by inflection or a slight change.[1]

For the sake of clearly discriminating between the various compounds of *onym* which are referred to in this paper, the

[1] *Isonymy* was also suggested by my colleague, Prof. Shackford, but not until after *paronymy* had been published.

English word *organ* may be taken as an example equally familiar and striking. *Organ*, a portion of the body, is the *homonym* of *organ* (Anglo-Saxon), a musical instrument; it is the *synonym* of the English word, *part;* the *heteronym* of the Latin *pars*, and the *paronym* of the Greek ὄργανον, the Latin *organum*, the French *organe*, the Italian *organo*, and the German *organ*.

Many of the Latin names employed by me, and their English equivalents, do not occur in the dictionaries of those languages, but the principle involved is linguistic and general rather than special and scientific, and I have endeavored to ascertain the prevailing practice respecting words in common use.

The conversion of a Latin word into its English paronym is commonly effected in one of the following ways:

(*a*) The nominative is adopted without change in either singular or plural—*e. g.*, *basis*, *crisis*, *series*.

(*b*) The singular is unaltered, but the plural has an English form—*e. g.*, *index*, *indexes* (not *indices*); *peninsula*, *peninsulas* (not *peninsulæ*); *memorandum*, *memorandums* (not *memoranda*). In like manner the Hebrew words *cherub* and *seraph* are treated as English words, and pluralized as *cherubs* and *seraphs* rather than, according to the Hebrew idiom, *cherubim* and *seraphim*.

(*c*) The ultima is dropped from the nominative, leaving the stem entire—*e. g.*, *canalis*, *canal*.

(*d*) The ultima *a* or *ma* is dropped from the nominative, leaving less than the original stem—*e. g.*, *diaphragma*, *gen. diaphragmatis*, *diaphragm; epigramma*, *epigram; programma*, *program*.

(*e*) The ultima is dropped from the genitive, leaving the stem, which may be a little longer than the nominative—*e. g.*, *positio*, *positionis*, *position; centurion*, etc.

(*f*) A diminutive dissyllable containing an *l* is reduced to a monosyllable, but the vowel of the ultima becomes a silent *e*, and the vowel of the penult may be elided—*e. g.*, *plumula*, *plumule; receptaculum*, *receptacle;* etc.

(*g*) The ultima is reduced to a silent *e*—*e. g.*, *scala*, *scale; ingratus*, *ingrate;* etc.

(*h*) The triliteral *rum* becomes the biliteral *er*—*e. g.*, *specter*, *meter*, *theater*.[1]

(*i*) A final *s* after *n* commonly becomes *t*—*e. g.*, *respondens*, *respondent*; etc.

(*j*) The Latin diphthong *æ* becomes *e*, as in the conversion of the prefix *præ* into *pre* in many words. In like manner, though less uniformly, *æ* becomes *e*.

There are abundant examples of paronymy among the names of other parts of the body, and I select only a few of the more common, which also exemplify the proposed extension of the system to neuronymy: *ovarium*, ovary; *oviductus*, oviduct; *sternebra*, sterneber; *musculus*, muscle; *nervus*, nerve; *acetabulum*, acetable; *umbilicus*, umbilic; *diaphragma*, diaphragm; *stomachus*, stomach; *carapax*, carapace; *leucocytus*, leucocyte; *palpus*, palp; etc.

In connection with these more familiar examples of paronymy it is to be noted, first, that, for the most part, the changes that occur are in the direction of *reducing the number of syllables or of letters, or of both.* What was said by Horne Tooke of the latter is equally true of the former; syllables, like "letters, tend to drop off in a long march." Second, as might be expected, these reductions have been applied more generally to longer words—for example, *penultima* and *antepenultima* have become *penult* and *antepenult*, while the less cumbersome *ultima* is left untouched.

What I propose and advocate is simply this:

That, so far as possible, for each part of the neuron (*central nervous system*) *there be found or made a name consisting of a single Latin word; that for each such Latin name there be found or made an English equivalent—not a translation, but a paronym; and that, in obtaining these names, Latin and English, due regard be had both to existing nomenclatures and to the established rules of etymological conversion.*

The origin and basis of each English neuronym is

[1] The ending *re* is distinctly French, as is practically admitted by those who write *maneuverer* and *maneuvering* even when they insist upon *maneuvre*. There is no more reason why an English writer should use the French *metre* than that he should select the German or Latin *metrum*, the Greek μέτρον, metron, or the Italian *metro*.

assumed to be a Latin word. This may be (*a*) primarily Latin, *e. g.*, *porta ;* or (*b*) derived from the Greek and in use by the Romans, *e. g.*, *aula ;* or (*c*) so derived in later times ; or (*d*) formed from some modern language in accordance with recognized rules, as *e. g.*, *cimbia.*

Whatever, then, may be its origin, direct or indirect, the English neuronym has a Latin form ; it is Latiniform ; but it presents, for the time, an English face and dress.

It will be noted that to carry out the principle of paronymy it is necessary first to select the Latin names. The principles on which I believe such selections should be based have been presented already before this Association and elsewhere ; suffice it now to call attention to the fact that *paronymy is applicable only to names of a single word each*, and that hence its acceptance as a desirable principle will in itself aid practically and strongly in the choice of terms from among those now existing and in the formation of new ones.

The paronymisation of the neuronyms employed by me in accordance with the rules illustrated by the foregoing examples will be found, upon the whole, to present no difficulties. *Cœlia* and its compounds become *cœle*, pl. cœles, etc. ; *tela*, tele, teles, etc. ; *plexus*, plex, plexes, etc. ; *pedunculus*, peduncle ; *commissura*, commissure ; *hippocampus*, hippocamp ; *cornu* is pluralized as an English word, cornus ; *perforatus* and *geniculatum* become perforate and geniculate ; *valvula* becomes valvule ; *pyramis*, pyramid ; *opticus*, optic, pl. optics ; *oliva*, olive ; *calcar*, *arbor*, *iter*, and most words ending in *a* are unchanged and have plurals in the English form.

The words *myelon* and *encephalon* require special consideration on account of their significance and frequent employment. In a recent paper (63, 354), I suggested that the English forms of the Greek μυελος and ἐγκεφαλος should be *myel* and *encephal*, these words being not only shorter than those in common use, but also comprising the part of each which is retained in composition or inflection, as in *myelitis*, *encephalic*, etc. It was also shown that, instead of the unwieldy adjective, *myelonal*, the analogy of *encephalic*

would give us *myelic*. I wish now merely to reaffirm my belief in the correctness of the statements and views advanced in the paper referred to, and to strengthen the position there taken by what seem to me to be a sound rule for our guidance, and an appropriate example.

The rule is, that in all etymological matters, excepting where definite and sufficient reasons to the contrary can be adduced, scientists should conform to the customs and principles of more strictly literary writers, who are supposed to give particular and expert attention to such subjects. The example is that of the analogous Greek word, ἄγγελος, which becomes *angelus* in Latin and *angel* in English, the corresponding adjectives being *angelicus* and *angelic*. Similar conditions prevail with *monolith* from *monolithus* and μονολιθος and doubtless other cases will occur to members of this Association.

As among common words, however, there are exceptions to the general rules as to the methods of paronymisation and even as to the application of the principle at all. For example, while the English paronyms of *aula* and *porta* would be *hall* and *port*, in the first place the Latin words are none too long, and in the second, the English forms would be ambiguous.

Exceptions also may well be admitted in the cases of *enteron*, *neuron*, and *axon*. The first has been in use, both alone and in combination, as a mononymic equivalent for *alimentary canal;* the other two were proposed by me last summer (56, 114) for the nervous axis and for the mesal, skeletal axis of the body, whether bone, cartilage, or membrane. The strictly English paronyms, *enter*, *neur*, and *ax*, would be more or less ambiguous, and the monosyllabism of the two latter is as objectionable as the sesquipedalian polysyllabism of some other words.

Certain paronymic changes are to be avoided on account of some undignified suggestion connected therewith; for example, *medic* is the legitimate paronym of *medicus*, but is commonly regarded as slang, and *umbilic*, though not only legitimate but in actual use, is not looked upon with favor. In like manner, though *cerebell* is the natural paronym of

cerebellum, it sounds too much like the adjective *cerebral*, and like the personal name *Sarah Bell*, and in proposing, nearly a year ago (56, 114) for the polyonyms *axis neuralis* and *cerebro-spinal axis* the mononym *neuron* rather than *neurum*, I had in mind the obvious objection to a term so nearly resembling the name of an intoxicating liquor.

In a few cases there will, doubtless, be a difference of opinion or taste with respect to the form of the plural. For example, as we retain the Latin *alumni*, so we may prefer to say *thalami* rather than *thalamuses;* but with shorter words like *crus*, *vagus*, etc., there seem to be good precedents for English plurals in *rebuses*, *omnibuses*, etc. So, too, the plurals *abdomens* and *albumens* justify *ponses* and *foramens*, and the latter has been employed already.

Leaving details to be determined in accordance with exact precedents, by your own Committee or perhaps by a more comprehensive body, I ask your attention to a few points of general interest.

In the first place, the method of naturalizing Latin terms into English is by no means new; our language is full of paronyms, and the very word *paronymy*, were there a Latin word *paronomia*, from the Greek παρονομια, would exemplify one of the most common changes in the termination of abstract nouns. The novelty consists simply in recognizing the method more distinctly, in giving it a name and insisting upon its usefulness as a neuronymic principle as against the heteronymy sometimes followed.

In the second place, the principle is equally applicable to other branches of organonymy. *Stomach* has been mentioned; *spleen* may be added, and, as will be shown later in this meeting, the Latin adjectives applied to arteries, veins, and nerves (*brachial*, *carotid*, *jugular*, *ulnar*, etc.) are almost invariably paronyms of classical originals. But, while it might be easier to demonstrate the practical working of the principle of paronymy with any other part of the body, the central nervous system has seemed to me better suited to begin upon, partly because of the greater need of reform, already mentioned, partly because the number of neurologists is comparatively small, and their general scholarship and authority exceptionally high.

Thirdly, although the subject has been regarded thus far from the standpoint of the English-speaking anatomist only, it must have already occurred to my hearers that unless the system is likewise applicable to the other languages in which most neurological contributions are published, it may rightly be objected to as a "one-sided re-baptism."

There are, however, many words which present similar or even identical aspects in several different languages. Familiar examples of what may be called *complete paronymy* are the following: L. *canalis*, E., F., and G., *canal*, I., *canale;* L. *centaurus*, E. and G. *centaur*, F., *centaure;* *præstigium*, *programma*, *musculus*, *nervus*, etc. A very perfect one, which is likewise a neural term, is *pyramid*, Gr. πυραμίς, L. *pyramis*, F. and G. *pyramide*, I. *piramide*. Among other neural terms, following strictly the analogy of ὄργανον, L. *organum*, E. and G., *organ*, F., *organe*, and I. *organo*, we have ἐγκέφαλος L. *encephalum*, E. *encephal*, G. *encefal*, F., *encephále*, I. *encefalo*.

There seems to be no assignable limit to the application of paronymy to the English, French, Italian and Spanish anatomical vocabularies, but with the German there are three obstacles: *First*, the less intimate relations of that language to the Latin; *second*, the very general adoption of vernacular words or compounds for neural parts; *third*, the apparent reluctance of some German anatomists to recognize the desirability of making smooth the way of searchers after knowledge. Nevertheless, modern neurological literature contains so many purely Latin words (*e. g.*, *centrum*) whose adoption into the language is practically admitted either by the use of German plurals or by combination with vernacular words that the ingenuity of German etymologists may be trusted to overcome the difficulties above mentioned.

Since each paronym suggests the original Latin name, the latter forms a bond of intelligence between writers and readers of different nationalities. Hence, writing for English readers primarily, if one prefers to employ English words as far as possible, he may retain the native aspect of his pages, and yet assume that his technical terms and their abbreviations will be recognized and understood by others.

With those who realize the desirability of a common medium of communication throughout the civilized world, it will not seem a defect in the system here proposed that any educated anatomist, whether English or French, Italian, Spanish, or German, can understand not only the original mononymic names, at least by the aid of a Latin dictionary, but also, almost as generally and readily, the paronyms of these names in either of the languages mentioned; since this gives ground for hope that, in the course of time, *some one of the paronyms of any given name may be everywhere accepted to the exclusion of all the rest, and thus pave the way to the establishment, in science at least, of a universal language, combining with the perfection of Latin construction a far greater richness and precision.*

To recapitulate, my plan for the amendment of neurological nomenclature is, as follows:

A. *The prompt and radical elimination of at least nine tenths of the names now on record.*[1]

B. *The selection or formation of appropriate, and if possible, pre-existing mononyms, for all the parts.*

C. *The agreement among anatomists of all nations to employ, not heteronyms, but paronyms, of these Latin terms formed in accordance with the genius of each language.*

Under paronymy there can be seldom more than one equivalent in any language for a given Latin name, and the names in all languages will be practically identical. And although, in some cases the formation of these paronyms may involve the apparent coining of a new word, yet they are not really new, and no more are possible. The heteronymic neuronymy of the past has been like an unrestrained conflagration sweeping in all directions and with no natural limit. Paronymy may, as it were, require the destruction of a few houses, and thus simulate the very thing we are trying to suppress, but in itself it sets an impassable barrier to the progress of the objectionable condition.

Excepting, on the one hand, in addition to those of

[1] For example, at least 23 names begin with the word *Tænia;* I have proposed to restrict that word to a single part, *Tænia semicircularis*, so called, and thus secure a restricted mononym, at the same time getting rid of 22 Latin synonyms, not to mention all the heteronyms in other languages.

Owen and Pye-Smith, a few felicitous mononyms which seem to have been such by accident rather than from design, and allowing, on the other, for several errors and inconsistencies due to haste or ignorance on my part, the distinctions between all other neuronymic vocabularies, ancient or modern, and that which I have advocated and employed during the past five years may be fairly expressed by describing the latter as consisting of names which are for the most part:

Designatory rather than descriptive.
Vertebrate " " human.
Restricted " " unrestricted.[1]
Correlate " " irrelate.
Co-ordinate " " inco-ordinate.
Classical " " vernacular in origin.
Micronymic " " macronymic.
Dissyllabic or trisyllabic rather than monosyllabic or polysyllabic.[2]
Mononymic rather than polyonymic.
Paronymic " " heteronymic.

Of the foregoing characters it is to be noted that the first five regard more particularly the parts themselves and their relations, while the others concern primarily the names; the former are logical characters, the latter etymological.

I ask also attention to the fact that the above adjectives simply state characteristics, contrasted it is true, but with no distinct assumption of superiority on the part of the one vocabulary over the others; hence the relative advantages of any pair of characters may be discussed irrespective of my personal belief that names such as are described in the first column are, as a rule, *euonyms*, while *caconymy* summarizes the attributes enumerated in the second.

That this system is practicable and "labor-saving" may be inferred from its prompt and more or less complete adoption by working neurologists like Spitzka of this Association, Osborn of Princeton, and Wright of Toronto, not to mention several successive classes of my immediate students. Should it prove permanently and generally acceptable, permit me to hope that it may be

[1] *Peduncle* and *fissure*, for example, apply only to parts of the cerebellum and cerebrum respectively.

[2] The new names proposed by me, *porta*, *aula*, *delta*, *rima*, *cælia*, *terma*, etc., are indications of preference.

known as "the Cornell system," not simply in recognition of the aid in its elaboration which has been given by my colleagues and students in a university unhampered by tradition, but because, in accordance with the whole spirit of that institution, its most comprehensive and distinctive characteristics are its *practicality*, and—to use the word applied to it by the "professor and autocrat" (Holmes, I)—its *reasonableness*.

At the last meeting of this Association some objections to this nomenclature were ably and courteously offered; others have been published, and others again have occurred to me, but have not, so far as I know, appeared in print. If I do not discuss all these objections upon the present occasion it is partly because it would extend this address to an undesirable length, and partly because, after prolonged reflection upon them, putting aside any personal feeling in the matter, I believe that, all things considered—the future as well as the present and the past—they are not sufficient to outweigh the advantages of the proposed modifications.[1]

I will mention one because its apparent force is much greater than its real; namely, that the proposed system involves a still farther addition to the list of "burdensome neologisms."

But it is to be noted, as has been stated on previous occasions, that, excepting the comparatively small number of cases in which parts were really new or previously inadequately discriminated, *nearly all of my apparently new names are merely old and well-known terms under such thin disguises as translation, combination, or abridgment.* In one sense, *medicommissura* may be a new *word*, but it is really only the two words *commissura* and *media* joined into one, and not properly to be regarded as a new *name*, a neonym, at all. According to the letter of the law I might be convicted of neologism, but its spirit would acquit me of neonymy in any unusual or unjustifiable degree.

[1] In a note (*The Medical Record* for August 1st, p. 139,) I claim that my position is strictly intermediate between the classicalism which may appear pedantic, and the vernacularism (heteronymy) which may be undignified. As a not unhappy mean between two extremes I am reminded of Lord John Russell, who "knew he was right because all parties found fault with him.

Still less is the objection sound in respect to the apparent additions to the vocabulary due to the application of the principle of paronymy to my own or other names. To say *medicommissure* instead of *medicommissura*, or *postperforate* instead of *postperforatus* is hardly more coining a new word than it is to employ a previously unused but regularly formed case of a noun or tense of a verb.

To the unniversal objection that any change at all is troublesome—to *us*—and that we are not called upon to inconvenience ourselves for the sake of posterity, since "posterity has done nothing for us," it may be replied, that to maintain that "whatever is, is right," and not to be improved, is as shortsighted as the opposite doctrine that whatever is, is wrong and not to be endured. To my mind, even less commendable than the acceptance of a poor name because it is new, is the rejection of a good one for the same reason.

The adage, "What is everybody's business is nobody's business," has been well exemplified in the history of neuronymy. Has the result of the "let alone principle" been satisfactory? Is there any well-educated, working neurologist who is really satisfied with the English neuronymy in general, or with his own particular vocabulary?

It was lately remarked by President—better known as Professor—Jordan, of the Indiana University, whom I am proud to claim as a former pupil, that "in matters of higher education, supply must precede the demand." Should it not be so with scientific nomenclature, with the language of exact knowledge? Should not, for example, the editors of dictionaries distinctly take ground against certain objectionable features, even though they be common, and as decidedly in favor of improvements, even when little known? Should not special organizations employ their conceded authority to encourage or restrain, carefully and wisely, of course, the desirable or undesirable tendencies of the current terminology in their several departments? Yet, even should I succeed in gaining from this Association an approval of the general plan of employing, as far as practicable, English paronyms of Latin mononyms, I am not so

sanguine as to anticipate for others any immediate or considerable inconvenience from the too rapid progress of neuronymic reform. Whatever may be the general pressure from students and the public, definite innovations are rarely made without the sanction, or at least the toleration, of those who are most inconvenienced by any departures from custom. The beginner can learn the new terms even more easily than the old, and at any rate he has nothing to forget. But the trained anatomist shrinks from an unfamiliar word as from an unworn boot; the trials of his own pupilage are but vaguely remembered; each day there seems more to be done, and less time in which to do it; nor is it to be expected that he will be attracted spontaneously toward the consideration that his own personal convenience and preference, and even those of all his distinguished contemporaries, should be held of little moment as compared with the advantages which reform may insure to the vastly more numerous anatomical workers of the future.

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RACE AND INSANITY.

THE NEGRO RACE.[1]

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AMONG the psychical phenomena presented by negroes which most deserve study are the revival of the Voudoo superstitions and the frequent recurrence of attacks of sexual furor, especially in the spring. These last, in their predominant characteristics, most strongly resemble the attacks of sexual furor in the bull and elephant, and are also analogous to the running "amok" of the Malay. It is difficult to study these attacks of furor, since they are soon treated by the prescription of lead, hemp, or steel in sufficient quantities to produce euthanasia. It is noteworthy that these attacks were rare during the war when the fidelity of the negro to the wife and children of his absent master was proverbial, and that they are especially frequent in States once cursed by "carpet-bag" statesmen, where changes in the social status of the negro were especially frequent.

Is the insanity of the negro tinged by the psychical phenomena just mentioned? Paretic dementia, a psychical manifestation of a cerebral disease, is a psychosis which offers good means of testing this question.

Among the cases admitted to the Cook County Hospital for the Insane, was

G. B., who was forty-nine years old, a man of good general education, a professional pugilist, a man of powerful build. At the end of the exciting political campaign of 1884 he became

[1] A series of studies in ethnological psychiatry.

emotionally exalted, and in about one month was admitted to the above-mentioned institution. He had had syphilis five years before admission. His knee jerk and gait were normal, but his grasp of the dynamometer resulted in a very irregular wavy line. He claimed to be the greatest tragedian in the world, and to be very wealthy. He spoke slowly and deliberately, and was very dignified in his manner. The day following he had a sudden attack of furor, and gave evidences of visual hallucinations. His speech had become hesitant, his pupils unequal, and tongue tremulous. He claimed to have the largest brain in the world. For the next few days he was very emotionally exalted. He claimed to be able to whip all the pugilists, and to be worth millions.

In about a week thereafter he complaimed of neuralgic cephalic pains, which he two days afterwards ascribed to a spell laid on him ; "he was hoodooed." The same night he set fire to his bedtick to burn the witches out of it. He "saw two of them, and twice he burned them up." Three days after this he began to display olfactory and gustatory hallucinations, and in a week both senses were much diminished, smell being almost destroyed. About the same time he had a violent attack of sexual furor, followed by an hallucination of a woman "older than Eve, but more beautiful, with whom he had intercourse." His sense of taste and smell are now much impaired, and he is rather querulent.

In this case it will be noted that syphilis existed long before the paretic dementia, but syphilis was very common among negroes, before the war, despite which paretic dementia was rare until they were subject to the strain of commercial life. Certainly the negroes in New York are not less libidinous nor less syphilitic than those of Chicago, but paretic dementia is less common among the former. This would seem to indicate that the predisposing influence of lues is not as great as has lately been supposed to be the case. The ideas about "hoodooing" were not strictly delusions, but the result of mental weakness. In an ordinary negro these would have been without significance, but this man, a leader among his people, had encouraged scepticism as to hoodooism. When his intellect began to be impaired and he could not account for his neuralgiæ he referred them to witches, after referring them at first to electricity. Despite his enormous strength and skill as a boxer, he was easily managed as a rule. His sexual furor was a decided furor closely resembling that occasionally noticed in the cynocephalus. His visual hallucinations were all obviously secondary.

Those about witches arose from the neuralgiæ, having suggested occult influences.

The general characteristics of the next are much the same as the former, but the man was of decidedly lower mental calibre.

CASE II.—J. W., age, thirty-seven, nativity, American; education, common school; Protestant, married; business, bar-tender; has had syphilis ten years ago. Knee-jerk asymmetrical: exaggerated right, a diminished left; temperature 97½ in right axilla, normal in left. On admission it was found that the patient had always been temperate and of a quiet disposition, reserved and uncommunicative. He has had trouble with his family about some property left him by his father. Says he is king of the world, that he laid out the City of Chicago, and that he is going to build a wall around it. Feels happy and contented, and is inclined to make puns. On the next day uncontrollable sexual furor. Tore up the water closet, and attacked the attendants. Three weeks later complained of being "hoodooed," which stopped his thoughts. He has seen the person who "hoodooed" him. His sense of smell was at first keen, even exaggerated, but latterly he had olfactory hallucinations followed by its disappearance. He died of apoplexy.

CASE III.—J. B., barber, age forty, special senses normal on admission, knee-jerk exaggerated on right, absent on left. Has had syphilis five years ago. Has some bronchitis. Skull prognathous dolicocephalic. Says he is building golden churches on Michigan Avenue; is the Son of God. Went to the alarm box and telegraphed Mayor Harrison that he would call on him this evening in a carriage. Has hesitant speech. Claims to be a member of the Trinity. He had a tremulous tongue, facial folds unequal; knee-jerk normal. He claims that Mayor Harrison is superintendent of his works. He claims to own Philadelphia and Chicago. States that Mayor Harrison is the "sixth" God, but as a deity, is inferior to himself. In a colloquy with a white paretic dement he recognized the absurdity of the latter's delusions. He has been relatively quiet. Made several attempts to get out of the door. Refused to eat in dining-room; wanted to go up stairs to eat with "God," whose food he smelt. Quiet until bed time, then he was obstinate. Three weeks later he was dirty in habits. He displays marked paretic furor, and has very marked grandiose delusions. He died suddenly of apoplexy.

CASE IV.—D. W., age thirty-four, married. For a year before admission he was melancholy and distrait, and showed a great tendency to forgetfulness. Seven years ago contracted syphilis. About a month before admission he stole a milk can in open day, and in presence of a policeman, to whom he offered to sell it. He was arrested, sent to the Bridewell, and there found to be insane.

He claimed to be immensely wealthy, owning millions of gold and coal mines, and being the "prime" secretary of God. His pupils and facial folds were unequal; tongue tremulous. His right knee-jerk was exaggerated; left normal. He began to complain of pains in the head about three weeks after admission, which was followed by ideas about being hoodooed. He, however, had such ideas before he became insane.

CASE V.—A. H., aged fifty-five, laborer. When twenty years old contracted syphilis. About the age of forty-five he began to experience lightning-like pains in the limbs, followed by the development of locomotor ataxia. Two years before admission had frequently recurring attacks of melancholia of brief duration. On admission was very jovial and exuberant. The bulbar symptoms of the disease were well marked; both knee jerks were absent. He had the delusion that his legs were made of gold. That he had a million diamonds in his head. That his eyes were made of crystal, and hung on a gold pin. He had frequent lachrymose periods, followed by periods of exuberance. At times he ascribed his lightning-like pains to "hoodooism," but in a way a sane negro might have done.

The psychical peculiarities dormant in the race crop out very prominently in these cases, and it would appear certain from these that the question about the influence of the superstitions of the race must be answered in the affirmative.

A CASE OF DESTRUCTIVE LESIONS OF THE TEGMENTUM AND THALAMI OPTICI OF BOTH THE SUBTHALAMIC REGION OF THE LEFT, AND THE CORPUS STRIATUM AND NUCLEUS LENTIFORMIS OF THE RIGHT HEMISPHERES, WITHOUT APPARENT LOSS OF SENSATION OR MOTION.

By Dr. H. D. SCHMIDT,

PATHOLOGIST OF THE CHARITY HOSPITAL OF NEW ORLEANS.

Some time ago I met in the autopsy-room of the Charity Hospital a subject upon which, without my previous knowledge, an autopsy had been made by one of the resident students. When inquiring for the nature of the disease from which the patient had died, I learned from this student that the patient had not been an inmate of the wards in his charge, but that he had performed the post-mortem examination for one of his fellow students. All he knew of the case was, that the patient had, previous to his death, suffered from a slight diarrhœa, accompanied by an excessive debility ; while his post-mortem examination had shown all the organs of the thorax and abdomen in a normal condition, excepting the small intestines, which had exhibited the signs of hyperæmia.

As the brain of this subject had remained untouched, I concluded to use this organ for some special anatomical purpose, and accordingly had it injected with a strong solution of chromic acid, before it was removed from the cranial cavity. But when examining it, after its removal from the cranium, I was surprised to find a part of the cerebellum—viz., the tonsils, pyramid, uvula, and nodolus—considerably softened, a condition which not only rendered the organ unfit for my special purpose, but, moreover, caused me to suspect the presence of some further lesions in its interior. I proceeded, therefore, to separate the cerebellum, medulla oblongata, and pons from the cerebrum by a section through the crura cerebri along the upper border of the pons, and just below the corpora quadrigemina, and found, as I had anticipated, an extensive destructive lesion in the parts thus exposed, involving the whole tegmentum and neighboring parts of the

basis of the crura cerebri. A closer examination, however, revealed that the lesion extended to those parts of the cerebrum mentioned in the heading of this paper, and to be described hereafter.

Being forcibly struck by the want of correspondence existing between these extensive lesions of the brain and the clinical history of the case, as far as it had been told to me, I almost suspected some mistake to have been made, regarding the identity of the dead subject and the patient concerned in the history. But when directly interrogating the student in charge of the ward in which the patient had lived and died, I found that all I had thus far learned about this case was true, and that the physician of the ward himself had been unable to assign a proper immediate cause to the death of this patient.

The remarkable fact of the existence of such extensive destructive lesions, without any manifestation of a decided disturbance of sensation or motion on the part of the patient during life, as witnessed here, rendered the case in my eyes fully worthy of being reported. Through being at the time deeply engaged in the study of some other subjects, I must regret to have been unable to extend the microscopical examination to other parts of this brain than those mentioned ; the results thus far obtained, however, are sufficiently correct to explain the nature of the lesions concerned.

The following are the more prominent points in the history of this case, furnished to me by the student of the ward, and endorsed by his physician :

Salvador, Charles, laborer, native of Italy, forty-two years of age, admitted to the Charity Hospital on January 19, 1885. Previous to his admittance he had resided six months in Plaguemine, La. His habits were irregular, and his hereditary history obscure. According to his statement, his general health had always been fair, with the exception of having been sunstruck two years ago, and having had swelling of the lower extremities while still living in Italy ; otherwise he had never been ill. About six months previous to admittance to the Charity Hospital he had an attack of dysentery, from which he had more or less suffered until one month ago. Since that time he had felt a weakness and pain over the epigastric region. When admitted to the wards of the Hospital, on Jan. 19th the patient's general condition was poor, he was anæmic, and emaciated. His appetite was good, and his bowels were regular ; there was no organ found to be enlarged, nor could any structural change be determined by physical examination. The only symptoms of disease observed were weakness and indefinite pain in the epigastric region. His pulse was full and strong—eighty-four beats in the minute ; the respiration was twenty-four, and the temperature normal. The examination of the urine showed that this fluid contained a trace of albumin—about 1 per cent.,—a few leucocytes, and some shreds of epithelial cells from the mucous membrane of the bladder, while its

spec. gr. was 1010. For this reason suspicions were entertained that the patient might suffer from an initiary attack of Bright's disease. Subsequent examinations of the urine showed that the albumin had disappeared, while the spec. gr. had remained the same. In addition to the above description of the patient's condition it remains to be mentioned that he suffered from inflammation of the cornea of the left eye, for which reason he went daily to the department of the Diseases of the Eye for treatment.

While, however, the condition of this patient remained from day to day, about the same as above stated, his emaciation and debility slowly increased until February 14th, when he was taken with a slight diarrhœa, though he had no fever, and his appetite remained good, while his pulse was strong and full. On February 18th, the patient was confined to his bed, and very weak, in which condition he died without an apparent cause.

I have been assured by both, the physician and the student of the ward, that they had not observed the slightest loss of sensation, or motion, or other nervous disturbances on the patient, the only striking phenomena had been the increasing emaciation and excessive debility.

After having stated the above meagre clinical history of the case, I shall now proceed to describe, as far as circumstances will allow, the details of the extent and nature of the destructive lesions, observed on the brain under consideration. At the same time, however, I must remind the reader that this description cannot but be to a certain extent incomplete, on account of the chromic-acid solution that had been injected into the vessels of the organ, and which, though not altering the histological character of the anatomical nervous elements to such a degree as to render them unfit for microscopical examination, nevertheless had obliterated the natural color of the respective white and gray substances, and, furthermore, had increased their natural consistence. As regards this point, however, I may say, that taking into account even the effect of this solution on the nervous tissues, the consistence of this brain appeared to me greater, and its bulk smaller, than I had previously observed on other brains injected by the same solution.

The principal lesions extended, as already mentioned before, from the fourth ventricle upwards, to the thalami optici of both hemispheres, and to the sub-thalamic region of the left one. From the fourth ventricle up to the crura

cerebri, the tegmentum, enlarged in its dimensions, had preserved its consistence, while higher up it already appeared broken up into larger or smaller fragments of greater or lesser consistence. As far as I was able to judge this solution of continuity of structure did not exist during the life of the patient, but was rather caused by the force of the injection, which by rupturing some of the diseased blood-vessels, forced its way through the degenerated and softened nervous tissues, coagulating them, at the same time, in the form of larger and smaller fragments. The higher up the lesion extended the smaller and softer these fragments appeared, until in the thalamus opticus, nothing but the outer strata of the ganglion were left in the form of a shell. From this it appears that the degeneration had commenced in the cerebrum, and descended through the crura cerebri and pons downwards to the medulla oblongata. My observations show, furthermore, that in the two latter parts of the brain the disease remained principally confined to the tegmentum, while in the crura cerebri it was observed to have encroached, to a certain extent, upon the basis, though sufficient substance of the latter was left for the transmission of motor energy. The latter circumstance explains the absence of motor paralysis in the clinical history of the patient.

With the assistance of the accompanying drawings let us now consider the extent and nature of the disease in the pons Varolii and medulla oblongata, in which the degenerated nervous tissues had to a certain degree preserved their integrity. Fig. 1 represents a horizontal section of the two lateral halves of the pons Varolii, made at different heights, while Fig. 2 represents a sagittal section throughout the pons and medulla oblongata. In beginning with the horizontal section *a* on the left half of the pons, made about $\frac{1}{8}$ inch below the emergence of the crura cerebri, we observe the tegmentum *d* enlarged in its natural dimensions, and separated by a deep fissure, not only from the anterior part of the pons *c*, representing the pyramidal tract, or basis, of the respective crus cerebri, but also posteriorly from the lemniscus field *e* by a similar fissure; the course of the

transverse nerve-fibres of the pons, as the drawing will show, has also been deranged by the increasing dimensions of the tegmentum. At the same time, a difference of shade is observed between the anterior and posterior part of the latter. The extent of the fissure which separated the tegmentum from the pyramidal tract may be seen in Fig. 2, *g*. In examining now the horizontal sections of the right half of the pons, made $\frac{1}{8}$ inch higher up, just below the emer-

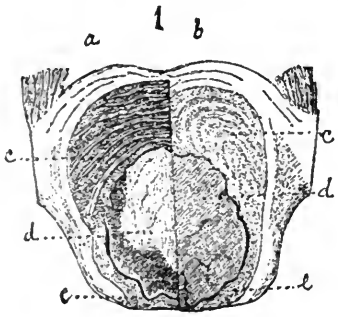

FIG. 1.

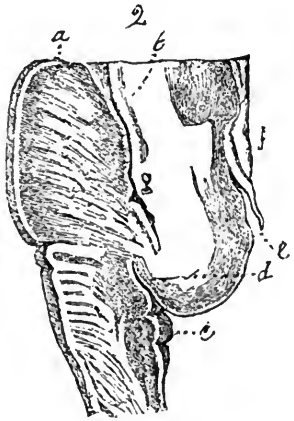

FIG. 2.

Explanation of the Illustrations.

Fig. 1.—Transverse section of pons Varolii ; *a*, one eighth of an inch below the emergence of the crura cerebri ; *b*, directly at the level with the emergence of the crura cerebri ; *c*, pyramidal tracts ; *d*, tegmentum ; *e*, leminscus field.

Fig. 2.—Sagittal section of pons Varolii and medulla oblongata ; *a*, pyramidal tract ; *b*, tegmentum, enlarged in its bulk, and projecting into the fourth ventricle ; *c*, entrance into the fourth ventricle (clava) ; *d*, fissure formed in the fourth ventricle by the projecting tegmentum ; *e*, aqueduct of Sylvius ; *f*, lingula ; *g*, fissure formed between the pyramidal tract and the tegmentum, described in the text.

gence of the respective crus cerebri, as represented in Fig. 1, *b*, we observe the course of the transverse bundles of fibres of the pons still more deranged, while, beside the fissures already mentioned, another appears running through the middle of the tegmentum, and to separate the anterior light part of the latter from its posterior, or darker shaded portion of the pons. As on the left half, on the right half also, the lemniscus field is found entirely separated from

the tegmentum. The examination of the sagittal section through the middle of the pons, as represented in Fig. 2, shows us the morbid downward growth of the tegmentum, bulging, in the form of a tumor, into the fourth ventricle. This enormous bulging into the latter gave rise, very probably, by the pressure which it produced, to the softening of those parts of the cerebellum mentioned before.

The higher up the morbid growth of the tegmentum extended, the more, as already stated before, it had undergone the softening process. On the left side, where the morbid growth extended throughout the whole tegmentum into the subthalamic region, and to the thalamus opticus of the left hemisphere, the softening process had been going on to the greatest extent, destroying the greater part of the latter, while also affecting the adjacent parts, such as the optic tract and the corpora geniculata, which were found considerably contracted. In the right hemisphere the same parts were invaded by the morbid growth, though not softened to the same extent as in the left.

Besides the lesions above described, there were a number of larger or smaller cavities found to have been formed in some parts of the left hemisphere. Thus, in the corpus striatum, a cavity 2 ctm. in length and height, and 1 ctm. wide, and communicating with smaller cavities, was met with in the nucleus lentiformis. Besides these, a number of smaller ones, about 1 mm. or more in diameter, were met with in both the corpus striatum and the nucleus lentiformis. Some of these smaller cavities were also found to exist in the cortex of the island of Reil and operculum. As regards the mode of formation of these cavities, we may presume that the larger ones were formed by the destruction of the walls, or septa, of a number of smaller ones, bordering one another. In the right hemisphere no cavities were found, but instead a number of prominences were observed upon the surface of the corpus striatum, which, when cut into, proved to be cavities, containing a serous fluid; they were probably formed in the same manner as the others—that is, by the breaking down of the neoplastic growth.

In examining carefully thin horizontal and longitudinal sections of the tegmentum of the pons it was found that the neoplastic element of the diseased parts, giving rise to their increased bulk, as well as inducing, at a later period, the process of softening, consisted of an exceedingly finely granular or fibrillary material, deposited between the nervous elements. But while many of the smaller blood-vessels of the diseased parts manifested a pathological condition by a considerable thickening of their adventitia, the ganglion cells and nerve-fibres showed no marked changes in their appearance. The only change to be noticed might have been the more than usual varicose form of the nerve-fibres. In some places the neoplastic element appeared entirely granular, whilst in others the minute granules had become arranged in rows, to form exceedingly fine fibrillæ, resembling those forming the neuroglia upon the surface of the cortex cerebri. The nuclei, or cells, belonging to the neuroglia of the diseased tegmentum appeared not to be increased in number. The walls of the various cavities in the corpus striatum and nucleus lentiformis presented the same structural changes as those above described.

Judging from this latter fact, I am inclined to regard the neoplastic material in this case as fibrinous in character, exuded from the blood-vessels as the product of a very slow inflammatory process.

Although there is nothing said in the history of this case which directly indicates the existence of some form of chronic cerebritis, the anatomical facts above stated nevertheless show that such a condition must have existed at one time or another; and the question might, therefore, be raised, whether the attack of sunstroke, from which the patient had suffered two years previous to his death, might not have been the exciting cause of a low chronic inflammation of the brain, giving ultimately rise to that morbid condition of this organ, described in the foregoing pages, and generally known as sclerosis of the brain. My own observations on the brains of sunstroke cases lead me to presume that such a condition existed in the brain of the above described case. Having, during the summer of 1865, taken

in charge, for the purpose of special study, all the sunstruck cases that were brought to the Charity Hospital, I had opportunity to observe the condition of the brain of numerous fatal cases that occurred. In all these instances I found this organ highly congested, while, on the other hand, those patients who recovered from the attack underwent a very slow reconvalescence, suffering for a long time afterward from a deeply seated headache.

A CRITICAL DIGEST OF THE PROCEEDINGS OF THE ENGLISH PSYCHICAL SOCIETY.[1]

By GRACE PECKHAM, M.D.

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THE English Psychical Society was organized in London January 6, 1882, and definitely constituted Feb. 20th of that year.

In view of the fact that more than three years' proceedings are now before the public, it is of no little interest to glance over the results which have been obtained, and to consider the conclusions arrived at after this period of diligent work and investigation. The more will this be profitable since an American Society with associates has been recently formed to carry on this same work.

The objects of the Society were announced as follows:

"I.—To unite students and inquirers into an organized body, with the view of promoting the investigation of certain obscure phenomena, including those commonly known as psychical, mesmeric, or spiritualistic; and of giving publicity to the results of such research.

"II.—To print, sell, or otherwise distribute publications on psychical and kindred subjects; to afford information to inquirers into these subjects by correspondence and otherwise; to collect and arrange facts respecting them; to open libraries, reading-rooms, and other suitable premises and offices; and generally to do all such other things as may be conducive to the attainments of the above objects."

[1] Proceedings of the Society for Psychical Research. Parts I., II., III., IV., V., VI., VII., VIII., from Oct., 1882, to April, 1885. Trübner & Co., Ludgate Hill, London.

To further these ends special committees were appointed to investigate the following subjects:

I.—An examination of the nature and extent of any influence which may be exerted by one mind upon another, apart from any general recognized mode of perception.

II.—The study of hypnotism and the forms of so-called mesmeric trance with its alleged insensibility to pain, of clairvoyance, and other allied phenomena,

III.—A critical revision of Reichenbach's researches with certain organizations called "sensitive," and an inquiry whether such organizations possess any power of perception beyond a highly exalted sensibility of the recognized sensory organs.

IV.—A careful investigation of any reports, resting on strong testimony regarding apparitions, at the moment of death or otherwise, or regarding disturbances in houses reputed to be haunted.

V.—An inquiry into the various physical phenomena commonly called spiritualistic; with an attempt to discover their causes and general laws.

VI.—The collection and collation of existing materials bearing on the history of these subjects.

The purpose of this paper will be to reveiw the work done by the committees in regard to the different manifestations of these psychical phenomena, and to give a summary of the conclusions arrived at.

I.—THOUGHT-TRANSFERENCE.

This is one of the most interesting and striking of the branches pursued by the Society. It has been the most thoroughly investigated, and the committee have arrived at definite conclusions, which are as follows:

"1. That much of what is popularly known as thought-reading is in reality due to the interpretation by the so-called 'reader' of signs consciously or unconsciously imparted by touches, looks, or gestures of those present; and that this is to be taken as *primâ-facie* explanation, whenever the thing thought of is not some visible or audible object, but some action or movement to be performed.

"2. That there does exist a group of phenomena to which the word 'thought-reading,' or, as we prefer to call it, *thought-trans-*

ference, may be fairly applied; and which consist in the mental perception, by certain individuals at certain times, of a word or other object kept vividly before the mind of another person or persons, without any transmission of impressions through the recognized channels of sense."

These conclusions were arrived at by the committee after a comparatively short experimentation, but upon what to them was evidence indisputable. Since these were promulgated, much investigation has taken place which has gone to confirm the above opinion.

The reader will notice that the committee first state that much which is called thought-transference comes from the interpretation of signs consciously or unconsciously imparted by touches, looks, or gestures of those present—in other words, what is known as "muscle-reading." A number of interesting examples of this are cited. Sometimes the person would go so quickly to the place or object designated, that it was almost impossible for him to be aware of any change of a material nature. He would also raise his arms quickly, when the object was above him, before the experimenter had thought of so doing.

Passing, however, from "muscle-reading," which exhibits merely extraordinary powers of perception of subtle changes of muscular tension to which some people are alive, rather than any psychical manifestation, we turn our attention to the proofs advanced for a belief in actual transference of thought.

In the outset it should be stated that the committee have endeavored to carry on these experiments in the most strictly scientific manner. They have kept a "perpetual vigilant watch" against all possibility of imposition or deception. In most of their reports these are detailed at length, but our space will not permit our mentioning these *in extenso*.

The experiments in thought-transference have included those with cards, numbers, fictitious names, descriptions of objects real and those imagined by the agent. It is difficult to tabulate these, but we submit two of the tables which give the result of the work up to April, 1883. Since then there have been a number of such experiments exhibiting similar results.

TABLE OF EXPERIMENTS ON THOUGHT-TRANSFERENCE.

SHOWING SUCCESS OBTAINED UNDER STRINGENT CONDITIONS, WHEN THE ADVERSE CHANCES WERE BEYOND 50 TO 1.

(To test the hypothesis of chance coincidence.)

Date.	Authority.	No. of trials.	No. right on 1st guess.	No. right on 2d guess.	Total right.*	Total percentage right.	Objects selected.	Percipients.
1881, Easter	Prof. Barrett	75			58	77	Playing cards, fictitious names, numbers of two figures, etc., chosen in each case by one of us.	The Misses Creery
" August	Mr. and Mrs. Sidgwick	23	6	6	13	56	"	"
" Nov. & Dec.	Profs. Stewart and Hopkinson	64	19	15	40	62	"	"
1882, Easter	Committee	346	122	51	186	54	"	"
" August	"	312	27	24	51	16	"	"
" Decemher	Prof. Barrett	109	19	7	26	24	"	"
" "	Committee	23	8	6	14	61	Pains, colors, words, figures.	Mr. G. A. Smith.
	Totals . . .	952	201	109	388	40.7		

* Inclusive of an occasional third attempt.

TABLE SHOWING SUCCESS OBTAINED WHEN THE SELECTED OBJECT WAS KNOWN TO ONE OR MORE OF THE COMMITTEE ONLY.

(To test hypothesis of collusion.)

Place of trial	Things chosen.	No. of trials.	No. right on 1st guess.	No. right on 2d guess.	Total right.*	If 1st guess only is counted experiment gave	The chance of success by accident was
a. Buxton Experiments	Playing cards †	14	9	0	10	1 right guess in $1\frac{1}{2}$	1 right in 52 trials
" "	Numbers, etc.	15	4	0	5	1 " " $3\frac{3}{4}$	1 " 90 "
b. Cambridge "	Cards †	216	17	18	38	1 " " 13	1 " 52 "
" "	Numbers	64	5	6	11	1 " " $12\frac{1}{2}$	1 " 90 "
c. Dublin "	Cards †	30	3	0	3	1 " " 10	1 " 52 "
" "	Numbers, etc.	108	32	11	43	1 " " $3\frac{1}{2}$	1 " 12 "
" "	Words	50	25	10	35	1 " " 2	1 " 4 "
	Totals	497	95	45	145	1 " " $5\frac{1}{4}$	1 " 43 "

a Present: Mr. F. W. H. Myers, Mr. Edmund Gurney, and Miss Mason. *b* Present: Mr. Myers, Mr. Gurney. Mr. Barrett, and Mrs. Myers.
c Present: Mr. Barrett only.

* Inclusive of an occasional third guess. † A full pack of cards was invariably used, from which a card was drawn at random.

The most startling experiments are those in which diagrams of objects have been reproduced by the percipient, either while the agent had them before him, or, as in some, when the results were most striking, the diagrams were drawn outside of the room in which the percipient sat, and the agent acted upon him from the mental picture which he carried.

Out of thirty-seven such experiments between Mr. Smith as percipient and Mr. Blackburn as agent, the former reproduced twenty-nine. In four he failed, and in four he could see nothing. Several experiments were tried, in which he did not reproduce diagrams, but described them. These he represented reversed, or upside down. The diagrams were mostly geometrical; but when a change was made to that of an animal, as a bird or a horse, without any mention of the fact to him, he drew shapes resembling them, though under the impression the while that he was producing geometrical figures.

From the reports written of experiments in the same line with two Liverpool young ladies, Miss R. and Miss E., it is not quite clear just how many trials were made. The results, illustrations of which are given, are equally striking. Of these sixteen diagrams are reproduced in the Proceedings. Most of these were done without the agent being in contact with the percipient.

A third set of diagrams was sent to the Society by a gentleman who drew the pictures for his little sister, thirteen years old, who reproduced them. Out of ten pictures six were almost perfect, and the remaining four were like the originals.

It is certain that with all the facts before the Society, the transference of ideas, of fictitious proper names, of colors, tastes, located pains, and above all the reproduction of drawings, the Psychical Society have accumulated a mass of evidence not easily set aside. Many will wish more, however, than this, and will look with greatest interest to the broader experiments in the same direction which are now being carried on by the American as well as the English Society.

II.—HYPNOTISM, MESMERISM, INSENSIBILITY TO PAIN, CLAIRVOYANCE.

As the committee themselves recognize, there is not the same opportunity for exploring in this direction as is offered by most of the subjects included under the head of psychical research. The ground has been thoroughly gone over, and as the report says, speaking of the subject: "The investigators of mesmerism have been both numerous and intelligent. The literature of the subject forms a small library." Nevertheless the committee are doing some excellent work in submitting the whole subject to renewed and careful experimentation. They have adopted as a general title to their work the word *mesmerism*, rather than *hypnotism*. The latter is applied to the phenomena "which are produced without *any special influence or effluence* passing from the operator to the subject." This has been adopted as a complete designation of these phenomena by those who emphatically deny that any such influence or effluence exists.

The report further states that the line between these two classes of alleged phenomena has not been overstepped. By the scientists of England "hypnotism" is pretty widely acknowledged and mesmerism almost universally rejected. If, therefore, further facts than the hypothesis of hypnotism is applicable to are found, the word "mesmeric" is necessary to describe them. The aim of the committee has been to obtain such facts, and the report proceeds to set them forth, after a brief statement of some experiments to show the influence of suggestion, the most remarkable of which were the efforts of the individual to carry out the dominant idea, many times in a manner very unexpected to the mesmerist and observers. One subject "admirably mimicked a parrot, a worm, a clock, a statue, a bear, and a frog. His leaps under the last-named impression were so energetic and so reckless that it became necessary to discontinue the experiment lest he should do himself an injury. When he was told on another evening that he was a nightingale, it was anticipated that he would confine himself to vocal imitation mainly. He, however, unexpectedly rushed without hesita-

tion at a high set of book shelves, which lined one wall of the room, mounted—one might almost say fluttered up —them with wonderful speed, and crouched in a corner on the top of the shelves, with his head against the ceiling, violently and ineffectually flapping his arms, as a bird, accidentally imprisoned in a room, will flap his wings. Nor was his assumption of combined parts less complete. He at once succumbed, for example, to the suggestion that one side of him was a nurse and the other a windmill; and for many minutes his sedulous though left-handed attentions to an imaginary infant were quite unimpaired by the no less sedulous revolutions of his right arm.'"

In the conclusion of the first report of the committee (April, 1883) the work to be done by them is fairly outlined, and can be no better stated than by quoting portions of it, after which we will analyze the work brought forward to sustain the propositions advanced:

"We have dealt thus far with three main phenomena connected with the mesmeric state, viz.:

"1. Dominance of a suggested idea.

"2. Transference of sensation without suggestion from operator or patient.

"3. Induction of general or local anæsthesia.

"The first of these three theses is, we believe, on the high road to universal acceptance. The mass of recorded testimony to it is enormous, and the discussions of physiologists are beginning to turn on the explanation rather than on the existence of the phenomena."

It is therefore to the transference of sensation without suggestion, and the question how the induction of general or local anæsthesia is brought about, to which the Society's attention has been turned. The production of anæsthesia has already been fully established by what seems to the committee "overwhelming completeness," but how it is produced is another matter. "Is it due to mere expectant attention exercised in a particular state of the nervous system?" "Is it the result of the inhibition of certain sensory centres in consequence of prolonged stimulation of the peripheral extremities of the nerves?" "Is it the

result of some specific effluence from the operator, which may act without actual contact, independently of the subject's knowledge or expectation theory?" To prove this latter, various experiments have been made. A subject would only respond to the mesmerist, even though a Babel of voices shouted his name and tried to distract him; but in the midst of it all the faintest whisper of a monosyllable from the one with whom he was in *rapport* would be answered by him invariably at once, even though the voice was so low as to be inaudible to a person sitting next to him. This was also done a number of times with thick curtains between the agent and the subject. The latter was entirely unconscious of the loud bellowing voice in his ear until the mesmerist told him he was to be spoken to by the gentleman, who then addressed him in the gentlest tone, whereat he at once complained of the excessive noise.

Another series of experiments was performed in the following manner: A list of twelve *yeses* and *noes* was written by one of the committee and put into the hands of the mesmerist, with the desire that he should successively "will" the "subject" to respond or not to respond in accordance with the order of the list. A tuning-fork was then struck and held to the ear. "Do you hear?" was asked twelve times, and answer or failure to answer corresponded in each case with the written yes or no of the list—that is, according to the silent will of the mesmerist.

The report especially says of these experiments, that however conclusive they may appear to mental influences acting otherwise than through recognized sensory channels, still they do not conclusively prove that there is a special physical *effluence* or force passing from operator to subject. The result is analogous to thought-transference.

A third set of experiments indicating this theory is as follows:

The subject was in a normal condition with the exception of *local* effects produced upon him without contact and without any idea or expectation of them. The subject's hands, placed so that it would be impossible for him to see them, were spread out before the mesmerist and

observers; care was taken to preserve a distance between the subject's fingers and the agent that when the passes were made there would be no contact and no appreciable current of air. After the passes had been made over two of the fingers by the mesmerist, and over the other eight by one of the committee, the former became perfectly stiff and insensible, as shown by testing them with a battery, with pricking, and with passing a lighted match over them. This, too, may be, says the report, another form of thought-transference. More conclusive, however, of the reality of a physical *effluence* are the experiments made with inanimate objects. A group of these, preferably not metal or coins, was taken, and one was handled by the mesmerist, the subject was, of course, out of sight and hearing at the time. This was picked out after each one was held for a moment in his hands. Ten small volumes of books were taken, so nearly resembling each other as to render it almost impossible to tell one from another; but the subject identified the mesmerized volume the instant he touched it. To eliminate thought-transference the person selecting the book was not allowed to be present. The other nine objects, or books, were handled by the others. The "subject" described his sensations as a "kind of mild tingling."

We would not represent the committee in these or in following reports as advancing with certainty the theory of transference of a physical effluence, but there is much in all that is said and written that argues a personal conviction that such is the case, and that it is their endeavor to establish what they themselves describe "as the least antecedently probable, the least generally accepted, explanation." And everywhere is advanced the idea of a specific influence as opposed to hypnotism.

The transference of sensations, such as pains, tastes, was confirmed by a number of extended experiments. This mesmeric sympathy was regarded as entirely consonant with experiments in thought-transference in the normal state.

III.—REICHENBACH'S PHENOMENA.

In a preliminary report to their investigations the committee make a brief statement as to the exact nature of

the phenomena described by Baron Carl von Reichenbach. He claims that certain persons declared to him that ordinary magnets, crystals, the human body and some other substances, were to those persons self-luminous, presenting singular appearances in the dark, and otherwise distinguishable by producing a variety of peculiar sensory impressions, such as anomalous sensations of temperature, bodily pain or pleasure, unusual nervous symptoms, and involuntary muscular action. These are generally (but Reichenbach believes not necessarily) accompanied by abnormal physiological and mental states. His further conclusions are, that all bodies whatever, in a certain degree, and magnetic and crystalline bodies in a high degree, produce peculiar effects upon exceptional organizations called "sensitive."

The committee fitted up a dark room thirteen feet square by twelve feet high, so arranged as to be perfectly darkened on a bright summer day. Even with large, white, polished surfaces, lenses, and silvered concave reflectors, there was not rendered visible any of the light assumed to still linger in the room. Furthermore, to exclude the effects of phosphorescence exhibited more or less by all substances, the apartment was usually darkened for an hour or more before each series of observations.

The magnetic objects which have been used have been permanent magnets of various shapes and sizes; a small portable electro-magnet, whose position could be easily changed; and a larger and more powerful one, with limbs 8 inches long, the same distance apart, of flattened section 2¼ inches by 7 inches, reduced to 2¼-inch circular at the polar surfaces, the whole 24 inches wound with wire, and mounted on a trunnion in a massive wooden stand, so that it could be inclined in any position. It was excited by a current of 8 (10 x 6-in.) plates. Small cells led to it from a commutator in an adjoining room.

After careful and repeated trials with forty-five subjects, of both sexes and of ages between sixteen and sixty, only three of these professed to see luminous appearances—A much smaller proportion of "sensitives" than, according to Reichenbach, should be found.

"The committee feel that the evidence is too slight to draw more definite conclusions than the following:

"*Firstly*, that three observers, separately, and on distinct occasions, were in some way immediately aware when an electro-magnet was secretly 'made,' and 'unmade,' under such precautions as were devised to suppress ordinary means of knowing and to exclude chance and deception; and identified such magnetization with luminous appearances, which, as described, agreed generally with the evidence recorded by Reichenbach.

"*Secondly*, that there were, though less decisively, indications of other sensory effects of magnetism."

In view of these apparent confirmations of previous testimony, the committee incline to the opinion that, among other unknown phenomena associated with magnetism, there is a *primâ-facie* case for the existence, under certain conditions not yet determined of a peculiar, and unexplained luminosity resembling phosphorescence in the region immediately around the magnetic poles, and visible only to certain individuals.

It is to be regretted that this committee has not published any further report since this of two years ago. It is to be inferred that experimentation since that time has been negative in results.

IV.—APPARITIONS AND HAUNTED HOUSES.

The committee have collected with praiseworthy perseverance a number of interesting stories, which, when published, will form a most unique addition to ghost-lore. Even though they have been at work since the beginning of the Society, it is not yet possible for them to classify and exhibit their work in a sufficiently satisfactory manner to come to definite conclusions. In the second report (July, 1884) the committee state that the evidence before them "unquestionably points to the reality of this class of abnormal phenomena. We are not investigating fables."

In the last number of the Proceedings (April 24, 1885), Mrs. H. Sidgwick publishes a long series of "Notes on the Evidence Collected by the Society for Phantasms of the Dead," in which she sums up the result of the Society's work in this direction as follows:

"*Firstly.*—There are large number of instances recorded of appearances of the dead shortly after their death, but generally there is nothing by which we can distinguish these from simple subjective hallucinations. In a few cases, however, information conveyed seem to afford the required test, but these are at present too few, I think, for us to feel sure that the coincidence may not have been due to chance.

"*Secondly.*—There are cases of single appearances at an interval of months or years after death, but at present none which we have adequate grounds for attributing to the agency of the dead."

V.—SPIRITUALISTIC PHENOMENA.

Very little has been reported in the proceedings of the work done under this branch of "Psychical Research." F. W. H. Myers presents a paper "On a Telepathic Explanation of Certain So-called Spiritualistic Phenomena," in which he says:

"An explanation, partly dependent on telepathic influence (thought-transference), partly on unconscious cerebration alone (though unconscious cerebration raised, if I must say so, to a higher power than had previously been suspected), has been offered for certain widespread phenomena, which, while ignored or neglected by the main body of men of science, have been for the most part ascribed by those who have witnessed them to the operation of some external and invading power."

In closing this paper, the writer remarks that he has made an appeal to spiritualistic newspapers with very little results.

"Those who believe themselves to be in possession of truth of this high value may surely be invited to take as much trouble to prove it as the chemist is willing to take in investigating a new compound, or a physician in identifying a new disease. As a mere matter of fact and without imputing blame to any one it may be safely said that no such persistent organized presentation of spiritualistic evidence has yet been attempted as is habitually demanded by the scientific world in matters of far less difficulty and importance."

VI.—THE LITERARY COMMITTEE.

This committee have been active in collecting material for a volume to be published under the title of "Phantasms of the Living." This will include narrations of dreams, premonitory, symbolic, or coincident, either with other similar dreams or with the external fact dreamt of; instances of so-

called second sight; accounts of apparitions during life, at the moment of death, or after death; or, on the other hand, of spectral illusions, recognized as such by the subject of them; or any other kind of abnormal phenomenon which is exactly recorded and fully attested.

We have taken especial pleasure in presenting this review of the work done by the English Society for Psychical Research for several reasons, but especially because it is so little known among investigators, and if known misapprehended.

Many have regarded the work as a metaphysical snare in which the unwary engage only to become entangled.

These problems are rife in the present age. To avoid superstition and blindness is to meet them on a ground as far as may be of purely scientific investigations. We have certainly in the last decade made wonderful advances in our knowledge of the nervous system, and all neurological investigators must feel that we are on the eve of still greater discoveries. Who can say that the investigations of these psychical phenomena are not some of the very many roads that will lead us to the Rome of certainty!

Society Report.

AMERICAN NEUROLOGICAL ASSOCIATION.

ELEVENTH ANNUAL MEETING.

First day, afternoon session.

The American Neurological Association convened at the New York Academy of Medicine, June 17, 1885.

Present—Drs. Ott, Weber, Graeme M. Hammond, Amidon, Rockwell, Seguin, Gray, Birdsall, Gibney, Geo. W. Jacoby, McNutt, and Dana.

The retiring President, Dr. Isaac Ott, of Easton, Pa., called the Association to order at 3 P.M., and after the following remarks introduced the Vice-President-Elect, Dr. Leonard Weber, of New York.

THE PRESIDENT'S ADDRESS.

Gentlemen: It devolves upon me to make a short address before retiring from the chair. In looking back over the past year I can, without hesitation, state that neurological science has been advancing with rapid strides, and that the physiology of the nervous system has not been at a standstill. If I may be permitted to refer to a subject upon which I have been working, I feel safe in forecasting that in the near future the relation of the nervous system to the temperature of the body will be an object of much important research. This problem is of considerable interest to the neurologist, and of much more value to the general practitioner. The researches of various observers lead up to the conclusion that the temperature of the body, like the heart, is under the control of the nervous system. Admitting this statement to be true, the next inquiry is

the location of these centres. Tscheschichin, nearly twenty years ago, believed a moderating centre to be in the brain. Eulenburg discovered a centre at the sulcus cruciatus which can cause a great rise in temperature, but lately he believes the increment of heat to be due to vaso-motor disturbance. In the JOURNAL OF NERVOUS AND MENTAL DISEASE for 1884, I published a paper showing that in the vicinity of the corpora striata were centres having a relation to the temperature of the body. Lately, Messrs. Aronsohn and Sachs have arrived at the conclusion that in the cerebrum are similar centres, whose position corresponds to the vicinity of the corpora striata. During the past few months I have attempted to more definitely map out the centres, and find them located in the anterior inner part of the optic thalami. Now the rise of temperature is due either to decreased dissipation or increased production. I made use of d'Arsonval's calorimeter, surrounding it with felt and feathers. Voit's respiration-apparatus served to note the quantity of air by its large meter and at the same time was used as an aspirator. I have found these centres to be concerned in heat production, thus elevating the temperature, and not generating it by lessened dissipation. These centres are then veritable heat centres, and not due to vaso-motor deflections, for in the latter case there would be lessened dissipation of heat. The cortex of the brain has not any thing to do with this rise of heat, as you can obtain the increase no matter at what part of the surface of the brain the needle enters. Further, removal of different parts of the cortex causes only a temporary rise, whilst the rise in the centres concerned lasts two or three days, and often amounts to about 4½° F.

The next order of business was the reading of the minutes of the last annual meeting. Dr. AMIDON moved that, as they had been published, the reading of the minutes be dispensed with. Carried.

The Treasurer made his report, which was accepted.

The Council reported, recommending the acceptance of the resignation of Dr. Mason as active member, and that he be made an associate member. Dr. Mason's resigna-

tion was accepted, and he was then elected an associate member.

The Council recommended the election to active membership of Dr. Philip Zenner, of Cincinnati, Ohio, and of Dr. M. Allen Starr, of New York. Both gentlemen were elected.

The Secretary read communications from Drs. J. S. Jewell and H. Gradle, of Chicago; S. F. Danillo, of St. Petersburgh; H. D. Schmidt, of New Orleans; C. K. Mills and J. T. Eskridge, of Philadelphia; Augustus Forel, of Zurich; and Roberts Bartholow, of Philadelphia. On motion, the communications were received.

NOMINATION OF OFFICERS.

For President, Dr. AMIDON nominated Dr. C. K. Mills, of Philadelphia.

On motion, the nominations for President were closed.

For Vice-President, Dr. V. P. Gibney, of New York, was nominated.

On motion, the nominations for Vice-President were closed.

For Secretary and Treasurer Dr. BIRDSALL nominated Dr. R. W. Amidon, of New York.

On motion, the nominations for Secretary and Treasurer were closed.

For Councillors, Dr. AMIDON nominated Dr. George W. Jacoby, of New York, and Dr. GIBNEY nominated Dr. E. C. Seguin, of New York.

On motion, the nominations for Councillors were closed.

On motion, the Secretary was instructed to cast an affirmative ballot for all the candidates nominated for office for the year 1886. The Secretary so cast his vote, and the Chairman declared the gentlemen elected.

The two following proposed amendments to the constitution and by-laws were then called up:

To amend Article VI. of the constitution, by striking out the words "third Wednesday in June," and inserting the words "first Wednesday in May." Proposed by Dr. W. A. HAMMOND.

All business not of a scientific nature shall be transacted

in executive session. The executive session shall be held after each session. Proposed by Dr. E. C. SPITZKA.

After a discussion of the first proposed, amendment by Drs. AMIDON, SEGUIN, GRAY, GIBNEY, and BIRDSALL, the amendment was laid on the table, and Dr. SEGUIN substituted the following:

Art. VI. The annual meeting of the Association shall be held on any two or three days in the month of July in each year as may be chosen by the Council. The Council shall also designate the place of meeting.

Dr. E. C. SEGUIN then moved the adoption of the second amendment.

After a discussion by Drs. GIBNEY, SEGUIN, GRAY, JACOBY, and BIRDSALL, the amendment was carried.

The Association then proceeded with its scientific work.

Dr. A. D. ROCKWELL, of New York, reported "A Case of Chronic Myelitis; Recovery."

The complete recovery of any case of chronic, supervening on acute, myelitis, in which all the most desperate features of that disease have been illustrated, is so rare an occurrence that, when such a result is claimed, the case should be subjected to the closest scrutiny. With this object in view I offer the following for your consideration and critical judgment:

Miss B., aged sixteen, was referred to me by the family physician, Dr. J. O. Farrington, of this city, September 22, 1884.

Three months previously she went on a Sunday-school excursion to the sea-shore, and all through the day experienced more or less physical depression, and, instead of actively engaging in exercise, she sat much of the time on rocks, near the water, which may have been damp from the tide. Upon returning from the picnic she felt cold, and was so bent over that she could walk only with difficulty. During the night and for several days she suffered acutely, and within a week the lower limbs became completely paralyzed, as well as the sphincters of both rectum and bladder. She suffered from an aggravated form of constipation, and from incontinence of fæces after the aperient that was regularly called for. Incontinence of urine was a constant symptom, supplemented by a severe attack of cystitis, and accompanied by acute pain.

After six weeks of suffering a bed-sore made its appearance in the region of the last lumbar vertebra. It resisted all treatment, and rapidly enlarged until it was about two inches in diameter.

For two months she lived almost entirely on milk and champagne. When I saw the patient she was emaciated to the last degree. Electro-muscular irritability to both currents was entirely abolished, the sphincters were paralyzed, the legs were contracted beyond the power of forcible extension, and the bed-sore was large, with a tendency to increase. The limbs were sensitive to the touch, with the paradoxical symptom of diminished sensibility when tested with the æsthesiometer. A marked perversion of sensibility was evidenced by the exceedingly disagreeable numb feeling excited by the induced current.

The faradic current had been used for several weeks previously, but, as was to be expected, without any effect whatever. I immediately began galvanizing the legs and the lower portion of the spine, using a current strength of about thirty volts, and repeating the applications every other day. Three weeks of persistent effort failed to elicit any response in the way of muscular contractions, and the only evidence that the treatment might possibly be doing good service was the improved condition of the bed-sore. At the end of the fourth week very faint muscular contractions were observed, and within another week they had so increased in vigor as to render it possible to interpret their character. They were markedly the reactions of degeneration. From this time onward the patient steadily improved. The electrical reactions became quite normal, and within a month the bed-sore had entirely healed. The patient regained power over the bladder more rapidly than over the bowels; but within two months she had complete control over both fæces and urine. She was treated some four months, and at the end of that time was discharged as cured, with the exception of slight weakness in the flexor muscles of the right leg. This weakness still remains, indicating a possible irreparable damage to certain nerve-cells.

There can be but little doubt that this case was in the beginning one of acute inflammation of the cord. What the exact pathological condition was in its secondary and chronic stage may be a question involving a greater difference of opinion.

The tendency probably was either to degenerative softening or atrophy of the ganglion cells, and, to my mind, it was the second rather than the first pathological change that prevailed in this case; and that the whole transverse area of the cord was involved was evidenced by the complete abolition of both afferent and efferent nerve function. The practical value of this case, so far as relates to the pathological side, is in its distinct negation rather than in any affirmation. It is self-evident that, however much

structural change had taken place in the way of atrophy of nerve-cells, or induration or overgrowth of connective tissue, the nutrition of these nerve-cells had not been sufficiently impaired to be beyond the influence of the reparative process.

In its therapeutic aspect the lesson taught cannot be too strongly emphasized.

The father, in the face of a completely discouraging prognosis, insisted that unceasing effort should be made, and subsequently his triumphant but somewhat reproachful thought was: "What would have become of my child if I had been guided by the professional opinion so confidently expressed?"

Remarks on Dr. Rockwell's Communication.

Dr E. C. SEGUIN: I am very much interested in the case. It reminds me somewhat of a number of cases I have seen in which the typical picture of poliomyelitis was obscured by the occurrence of weakness of the sphincters and slight dulness of sensibility. I believe that was all there was here. There was no absolute anæsthesia. It seems to me this case would come under the category of cases of modified poliomyelitis, with some extension into the central gray matter. It certainly cannot be brought forward as an example of cure of myelitis transversa. It leaves our unfavorable prognosis of that disease, from which I have never seen complete recovery, unchanged. I saw a case of poliomyelitis with Dr. Delafield about six years ago, in which the symptoms were nearly as severe as in Dr. Rockwell's case. There was retention of the urine, with paresis of the arms and legs, hyperæsthesia and very severe pains extending along the principal nerves. It seemed to be a case of diffuse myelitis, most marked, however, in the anterior cornua. That patient recovered entirely within two years, and is now doing the duties of an active citizen. Dr. Rockwell's case is exceedingly interesting, and is particularly instructive with reference to treatment. The time employed in the treatment by galvanism of course allowed of a chance of spontaneous restoration; but I have no doubt

that galvanism did something toward expediting the cure by improving the nutrition of the affected parts.

Dr. ROCKWELL: In the case seen with Dr. Delafield, were the sphincters affected?

Dr. SEGUIN: The bladder was paralyzed, if I remember right.

Dr. ROCKWELL: In my case the sphincters were paralyzed for many weeks, there being complete inability to prevent the passage of the urine and fæces. I have seen quite a number of cases of poliomyelitis anterior. This is not a typical case of poliomyelitis anterior; it is a typical case of myelitis, with the exception that there was no complete anæsthesia.

Dr. M. A. STARR asked Dr. Rockwell whether the treatment of the case was solely by galvanism, or whether other means were used which might possibly have had some effect in bringing about recovery. Furthermore, he would like to know how galvanism was applied; whether by interruptions to the muscles only, or whether the constant current was also applied to the cord.

Dr. ROCKWELL: No other remedies were employed except those resorted to in the beginning, and supporting measures, as cod-liver oil, etc.; and above all no other remedies directed to the disease itself. The current was directed to the muscles and also to the spinal cord, and I applied electricity to the spinal cord by means of very sharp and strong interruptions, as well as by means of the constant current, I thought that as there was no irritability at all it might be well to use the strong interrupted current as well as the steady current, in hopes that some improvement in nutrition might take place.

Dr. W. R. BIRDSALL: I would ask Dr. Rockwell whether all of the muscular groups were affected alike; whether there was absolute paralysis of all of the muscular groups in the lower extremities. Also as to the limitations of the sensory symptoms, which he said were slight. Also whether any observations were made with regard to the skin reflexes. I believe nothing was stated with regard to the tendon reflexes. It seems to me those are important points in

enabling us to determine whether there was poliomyelitis anterior or a transverse myelitis. I think we may have conditions in which a central myelitis of a transverse character may occur, possibly with slight involvement of the lateral columns, also of the sensory tracts in the posterior columns, making certain cases resemble strongly an ordinary case of myelitis of the anterior horns. I believe these cases are quite rare. It does not appear to me from the case, as stated, that we can regard it as one of anterior myelitis with involvement of the central tracts and lateral columns, especially as the sensory disturbances were of a slight character.

Dr. ROCKWELL: All the groups of the muscles of the leg were affected alike. I thoroughly tested all the muscles of the leg, and there was absolute loss of contractility in every muscle and fibre. With regard to the sensory symptoms, those were observed only in the toes. With regard to the patellar reflexes, I omitted to state that they were absent in the beginning, but they have returned. With regard to ankle clonus, I remember there was marked agitation of the foot.

Dr. V. P. GIBNEY: Is it possible to have absence of patellar reflex and marked ankle clonus? It is my impression that where there is absence of patellar tendon reflex there is also absence of ankle clonus.

Dr. ROCKWELL: I did not test the case for ankle clonus. I merely remarked that there was considerable motion of the foot.

Dr. GRAY, of Brooklyn: It depends upon what you call chronic myelitis as to whether you are going to regard recovery from it as possible or not. To take a case which appeared to be absolutely hopeless, which had not responded to treatment for months after the natural time for recovery had passed, and then to have it suddenly under a certain method of treatment recover, that would be quite a therapeutic discovery. But we do not know, after all, very much about myelitis. We can diagnosticate myelitis of the anterior horns; we can diagnosticate a myelitis of the columns of Burdach, a locomotor ataxia, or of the lateral pyrami-

dal columns; but autopsies and experimental investigations have shown us that there are probably many other columns of the spinal cord which are entirely distinct from one another in their functions, but whose symptomatology in disease is unknown. But from what we know of the symptoms arising from disease of the anterior horns, of the columns of Burdach, and of the pyramidal columns, it is very likely that the unknown columns also give rise to distinct symptoms in disease. When we come to speak of myelitis proper, we mean to say only that the patient has some form of myelitis that is not disease of the anterior cornua, or of the lateral pyramidal columns, or of the columns of Burdach, or of columns which are known in disease to give rise to definite symptoms; yet in that generic term, myelitis, may be embraced half a dozen totally distinct maladies. I have seen a good many cases which have lasted a long time seemingly, yet have finally made a perfect recovery. I have in mind one case, which Dr. Seguin will recall, that of a California gentleman, in which it required a year for recovery to take place. The first symptom which alarmed the patient occurred while he was in Virginia City. Within a week he reached San Francisco, and his symptoms getting worse, he started for New York. By the time he had reached the Isthmus of Panama he was completely paralyzed in the lower extremities. It was upward of a year before he recovered, and more than three months before there was any retrocession in his symptoms. I have seen several cases like that. So that the fact of recovery from rather chronic myelitis does not occur quite so seldom as Dr. Rockwell's experience would seem to show. I have noticed once or twice cases apparently quiescent for perhaps months, nothing seeming to be of any benefit, when quickly, after beginning the use of electricity, either the faradic or galvanic current, improvement would take place. I recall one case of typical myelitis of the anterior horn which had been in a quiescent condition for several years. The patient came to my clinic, and I gave a very unfavorable prognosis; and, in order to keep the patient coming to the clinic as the subject of a lecture, I

administered a powerful faradic current, and to my great surprise the improvement which took place in his condition could be estimated at about fifty per cent. I have seen the same thing occur in another case.

Dr. ROCKWELL: In closing the discussion I have nothing to say except that my case was a very gratifying one in its results. We would like to know what had been the exact pathological condition, but of course that question cannot be decided positively. The case was especially interesting to all of us, as showing that there was very probably a direct relation between the therapeutics employed and the recovery. Whether in time recovery would have taken place spontaneously is a question, but it seems to me exceedingly improbable, from the fact that so many weeks had gone after the acute symptoms had passed without any improvement being manifest, there being, on the contrary, an apparent progression of the disease. I think that more can be accomplished in the treatment of certain of these cases of myelitis by persistent effort than has been supposed to be possible.

Dr. M. A. STARR then read a paper entitled, "Recent Methods of Staining" (published in full in the JOURNAL OF NERVOUS AND MENTAL DISEASE, New Series, vol. x., p. 143, 1885).

Remarks on Dr. Starr's Communication.

Dr. E. C. SEGUIN: Has Weigert's method been used for large or transverse sections of the brain?

Dr. STARR: I have some transverse sections of the dog's brain stained after this method, and the result is very satisfactory. Not expecting to read my paper to-day, I did not bring them with me.

Dr. SEGUIN: With regard to Sankey's method and my modification of it, I may say that my attention was directed to its use while making sections of a brain in Zürich, in the summer of 1883. The history of this brain was not fully known, and it was uncertain whether it had not for some time lain in alcohol. At any rate it did not respond well to carmine, but, as usual when a specimen has been in

alcohol for any length of time, the results were not bright or distinct. I then thought of other methods, and came across that of Sankey. But by this method I found large sections intractable; having to be cut very thin, like a veil, they were difficult to manipulate, and became invisible when immersed in the solution. I therefore reduced the strength of the solution to two and to four thousand. Two thousand gave good results after six or ten hours. Three thousand enabled me to leave the specimen in the fluid overnight, which was an advantage. By this method, adopting a certain routine, one can prepare a large number of sections in the course of a few weeks. The only advantage I claimed for the method was for lens or naked-eye demonstrations. I also examined these sections with the microscope, and the ganglion cells came out very well, although possibly with the fault which Dr. Starr mentioned. I have also tried the method in preparing pathological specimens, and the reaction is very satisfactory.

The Society then adjourned, to meet at 8:30 P.M.

First day, evening session.

The Association was called to order at 8:30 P.M. by the Vice-President, Dr. WEBER.

Present—Drs. Weber, G. M. Hammond, Starr, Seguin, Dana, McNutt, Amidon, and Jacoby.

The minutes of the afternoon session were read and adopted.

Dr. GEORGE W. JACOBY then read a paper "On the Use of Osmic Acid in Peripheral Neuralgias."

Dr. Jacoby, after referring to the cases published by Neuber, Eulenburg, Wölfler, and Merces, said that particularly the results attained by the two latter were such good ones that it became imperative to corroborate them, or, if possible, to refute them. For this purpose he publishes a set of cases in which he used the remedy.

The manner in which he treated his cases was as follows:

He made use of a one-per-cent. solution of osmic acid in water, and of this 0.50 to 1.00, equal to 0.005 or 0.010 of the

acid, was injected. In a few cases less was used, but very rarely. Dr. Jacoby said, the preparation was that known as osmium tetroxide, OsO_4, commonly known in histological research as osmic acid. The preparation known as hyperosmic acid, which was used by Neuber and others, is probably the same. According to the best treatises on chemistry, such a combination does not exist, as no mention is made of it. The solution, when exposed to the light, rapidly becomes decomposed, turning dark, and ultimately quite black. Eulenburg says that it can, nevertheless, be used in this condition, but his (Jacoby's) experience has convinced him of the contrary. He considers it entirely inactive when in this state. For this reason it should be dispensed only in a dark bottle, and a small quantity only ordered at a time. He never prescribed more than 20.00 of the solution, this quantity serving about forty injections. The injections were always made as near as possible to the point of severest pain, and into the connective tissue surrounding the affected nerve. The pain caused by the injection is in many cases exceedingly severe, producing a stinging, burning sensation, which generally follows the course of the nerve. This pain, however, rarely lasts long, generally subsiding after a few seconds. Occasionally, also, local changes are produced, such as swelling and puffiness over the seat of puncture, and in many cases he has seen a hard circumscribed thickening of the skin and connective tissue produced in consequence of repeated injections, which only disappeared after days. There is no discoloration produced by the acid, except perhaps a single black spot where the needle was introduced. The action is a purely local one, no constitutional symptoms whatever being produced.

If various branches of a nerve are affected, it is necessary to inject over each painful branch. These cases will, however, be found to be mostly intractable ones. Certainly the results are better in those cases in which the pain is localized over a single branch. The nerves of the skin do not appear to be at all affected by the injections. and no anæsthetic action was discernible in any of his cases.

Three cases were then read in detail; two for the purpose of showing the general plan of treatment, and the third for the purpose of showing a possible injurious action of the acid. This case was as follows:

Female, æt. forty five. Seen in consultation April 12, 1884. Left cervico-brachial neuralgia. Principal seat of pain over the radial in the arm. The pain had existed for two years, and was probably the result of a periarthritis of the shoulder. Every remedy that had been suggested had been tried, but without result. I recommended a trial of the osmic-acid injection, and made one myself over the musculo-spiral nerve. I heard nothing more of the case for a fortnight, the attending physician having promised to continue the suggested plan of treatment. After the lapse of that period of time, on April 26th, the physician called upon me and told me that the case had progressed favorably until three days prior to his visit. The pain had gradually decreased, and prospects of an entire recovery were fair. At the time mentioned he made the sixth injection in the usual place. The patient complained at once of intense pain radiating downward into the thumb and forefinger. The pain at previous injections had been merely nominal. A few hours after that she called again and said that she had a feeling of numbness in the first fingers and along the outer border of the arm. The following morning the physician called upon her and found a well-marked classic radial paralysis. The patient had during the night slept with her arm thrown backward and under her head, and the doctor concluded that he had to deal with a common case of radial paralysis due to pressure. To me the case was not so clear. The sudden severe pain along the course of the radial after the injection, the advent of anæsthesia soon after, inclined me to the view that the paralysis was due to the injection itself.

Dr. Jacoby's cases, when analyzed, show us of 18 cases: 8 cures, 2 improved, and 8 unaffected. Of the 8 cured cases, 5 were cases of sciatica. All the cured cases, including the sciaticas, were old cases. Of the unimproved cases, 8 in number, 3 were fresh cases and two were old. The case marked 8 cannot be counted, and of 12 and 14 no note is made.

At any rate it would seem from these cases that the sciatic nerve is the one which is most impressionable to the action of this remedy, and that old inveterate cases present a greater chance of success than fresh ones. This is contrary to Eulenburg's experience, and in the present set of cases may be misleading. The remedy was used only ex-

ceptionally upon fresh cases, in the majority of instances it being used only as an *ultimum refugium.*

The conclusions then drawn were:

1. We have in osmic acid a remedy which is of service in the treatment of certain cases of peripheral neuralgia and in some cases where every other remedy has failed.

2. Osmic acid is not an antineuralgic; its action is very localized, and it frequently fails where other remedies succeed.

3. Its employment is, in most cases, very painful, and not altogether free from danger.

4. In view of Case 8, it is dangerous to implicate a motor nerve in the injection.

Remarks on Dr. Jacoby's Paper.

Dr. SACHS, by invitation: As Dr. Jacoby has referred to the fact that I have had opportunity to observe some of the results obtained by the use of this remedy, I would say that the experience which I have had with osmic acid was only in part satisfactory. Unfortunately I did not hear all of Dr. Jacoby's paper, and am not informed as to the exact conclusions at which he arrived. I am compelled to acknowledge that the remedy is unreliable in many cases. The only good results which I saw obtained from it were in cases of old standing, more particularly in cases of sciatica. I can recall several cases of sciatica which were under my care while I was in charge of Prof. Eulenburg's clinic in Berlin, and which did not yield to the usual form of electrical treatment. In these cases marked improvement was noted after repeated injections of osmic acid over the seat of the trouble. I believe that but one third of the cases reported by Eulenburg himself were treated successfully by this method. In my opinion the drug is worthy of a trial, particularly where other remedies have been employed without success.

Dr. E. C. SEGUIN: I have not had opportunity to use osmic acid, but I have had some experience with treatment upon the same general principle. The method of treating neuralgias by the deep hypodermic injection of nitrate of

silver and other irritating remedies was brought forward by Luton as far back as 1863. In 1864 I think it was that I treated one case of rebellious sciatica by that method, and in the Strangers' Hospital, a temporary institution in existence here about the time of the collapse of the Ring in 1873–4, I treated another case. Both cases were successful, and in both the neuralgia had existed for ten or thirteen years. The injections were made deeply and gave rise to abscesses. The solution employed was that recommended by Luton. There must have been an. inflammatory reaction set up about the nerve. In the case treated in the Strangers' Hospital the small abscess healed quickly. But in a case treated, I believe, on David's Island in 1864, the abscess became fistulous, and remained for many months a source of trouble. Luton relates many cases of neuralgia, particularly old ones, treated successfully by this method. It acts by producing counter-irritation close to the nerve. Hypodermics of quinine, I suppose, act on that principle. I published in the *New York Medical Journal*, August, 1867, cases of malarious neuralgia treated by hypodermic injections of quinine *loco dolente;* and I then suggested that the effects were probably largely due to the local effects of the irritating injection, as well as to the constitutional effects of the quinine. It seems to me that the general method, including a variety of remedies which may be employed for the injection, offers a large scope for successful practice. We may be able to find a substance which is not so liable to be irritating or to give rise to local trouble as osmic acid or nitrate of silver. Perhaps iodine or ether would do in many cases.

A word with regard to numbness and paralysis following deep injections over a nerve. I know of two such cases, one occurring in my own practice and the other in that of a friend. Five years ago I had a case of trigeminal neuralgia in which I made two hypodermic injections of chloroform on two different days near the infra-orbital foramen, according to the plan advocated by Dr. Bartholow. There was some relief of pain, but after the second injection there was very complete anæsthesia of the upper lip, which con-

tinued as long as I had the patient under observation, which was for several months. The other case was identical with this one. The physician gave, at my suggestion, I believe, a hypodermic injection of chloroform in the cheek. The drug entered too close to the nerve and produced anæsthesia of the upper lip. I have never seen a motor nerve affected by this treatment.

Dr. JACOBY: The remarks made by Dr. Sachs coincide pretty well with the conclusions I have drawn in my paper. I believe my successes were a little over a third. But the difference between Eulenburg's experience and my own in the causation of pain by the injection was notable. In the majority of my cases the pain produced by the injection was very severe, and may have been due to the preparation of the acid; but beyond the case of radial paralysis I have seen no bad effects from it. No bad effects followed the injection in the other fifty cases, or more, referred to. As to whether the acid acts only as a counter-irritant, I do not think we are able yet to say. The fact of discoloration of living tissue in Fraenkel's experiments might lead us to suppose that the drug interfered in some unknown way with nerve action. I should not recommend the use of osmic acid in every case of neuralgia, but it is well to know of the remedy and to use it when occasion demands.

Dr. SEGUIN: Does Eulenburg use a discolored solution? I should think that inert, from histological experience

Dr. JACOBY: Eulenburg uses a fresh solution, but he makes the remark that when it becomes discolored its action is not interfered with; it acts just as well as when fresh. But I find it different. The first cases I treated with an old solution and I obtained no results. Then I began a new set of cases with a fresh solution.

Dr. SEGUIN further remarked that Ranvier had employed hypodermic injections of osmic acid for the purpose of demonstrating the normal nerve-fibres, and also for obtaining specimens of fat-cells. It was a very successful method.

The meeting then adjourned.

Second day, afternoon session.

The Society was called to order by the President, Dr. BURT G. WILDER, at 2:30 P.M.

Present—Drs. Wilder, Weber, Seguin, G. M. Hammond, Gibney, Amidon, Starr, Gray, Jacoby, Birdsall, Dana, and Rockwell.

The minutes of the previous meeting were read and approved.

Dr. V. P. GIBNEY then reported two cases of spina bifida cured: the first by antiseptic incision, followed within a fortnight by chronic hydrocephalus, frequent aspirations of the head, and death from hydrocephalus; the second, a case cured by injections of the iodo-glycerine solution, according to the method of Morton, of Glasgow. The cases were presented for the purpose of directing attention to the radical cure of spina bifida.

CASE I.—A male child seven days of age came under his observation in July, 1884. The tumor was situated over the sacrum, and was well covered with normal skin except in its lower portion, where was seen a small indolent ulcer about half an inch in diameter, covered with a thin whitish crust. There was no hydrocephalus, nor any deformity of the limbs, and to all appearances the functions were normal. The sac was translucent, and no traces of nerve tissue could be seen in it. There was no history of hereditary influence. Two weeks later the tumor had perceptibly enlarged, and Dr. Gibney aspirated it once or twice, and injected the iodo-glycerine solution. He introduced the small needle of the aspirator and removed about one drachm of purulent fluid. This surprised him so much as to render his diagnosis doubtful, but further examination and consultation confirmed the original diagnosis of spina bifida, and the change from serous to purulent fluid was explained by the contiguity of the ulcer with the sac. Two days later the limbs were subjected to the faradic test, and the reactions in all the muscles were preserved. The patellar reflexes were much exaggerated, while there was also a marked ankle clonus. The rectal sphincter was paralyzed. The temperature was 100.2° F. Four days later, with strict antiseptic precautions, he opened the tumor with a bistoury and gave exit to a small quantity of pus, and dressed the wound antiseptically. Two days later the reflexes were less marked, and the general condition of the patient was improved. Four days subsequently there was prolapsus of the rectum and a profuse furuncular eruption over the lower half of the body posteriorly. The wound had healed and the tumor had appreciably diminished in size. Within a week the limbs were acting normally, but the prolapsus of the rectum continued.

Twenty days after the operation, the child then being six weeks old, there was unmistakable hydrocephalus, and from this time forward the spina bifida gave no trouble, and the solidity of the tumor convinced him that a cure had been wrought.

For the hydrocephalus he began a series of aspirations, and by the first removed two ounces of clear serum, having introduced the needle into the anterior fontanelle, to the right of the longitudinal sinus. No untoward symptoms followed, and the aspiration was repeated nine days afterward, when only one ounce was removed. The head continued to enlarge despite the two aspirations. About one month subsequently he aspirated again and removed three ounces of fluid. The subsequent history of the case consisted simply of a repetition of the operation with loss of sight, stupor, and finally death at the end of three months after the first aspiration.

At the autopsy Dr. Gibney had the assistance of Drs. Holt and Amidon. Section through the sacral tumor was quite difficult, fully one inch of dense cicatricial tissue being penetrated before the bony parts were reached. At the bottom of this mass was a small sac, the capsule of which was about ten millimetres. It contained no fluid whatever, but it communicated with the vertebral canal by a pin-point aperture through which a straw was inserted between the dura and the arachnoid to the point where the cauda equina begins. The laminæ of the sacral vertebræ were wanting, and the space was filled with dense fibrous tissue extending up into the canal.

On microscopic examination the dura was found thickened, most markedly posteriorly, and gradually getting thinner until the point of giving off the posterior roots was reached, when it assumed about its normal thickness ; over the anterior and lateral portions of the cord it was normal. Its greatest thickness, two millimetres, was in the lumbar region ; in the cervical region one millimetre thick. The inner surface was coated with a layer of lymph and lymphoid cells of varying thickness. The pia appeared everywhere thickened and infiltrated externally with some products of inflammation, and it seemed abnormally loose in its attachments to the cord. Dr. Amidon made this examination.

The tissue of the cord was apparently normal, unless it were unusally friable in the posterior column.

It was Dr. Gibney's opinion that the child had meningitis, chiefly confined to the posterior surface of the cord, and that the exudation when fresh might have, in places, produced a paraplegia from pressure.

The anterior fontanelles were much depressed ; the sutures were all widely separated. There was only a very small quantity of fluid within the cranial cavity ; the hemispheres were quite soft, and fluctuation was very marked. On puncturing the cortex four pints of serum escaped, nearly the whole quantity coming from the lateral ventricles. The remaining cortex was about one line in thickness. The ependyma was quite granular, and on the right

side presented four or five minute points, unquestionably wounds from the aspirator needle. There was no evidence of recent inflammation of the membranes of the brain. The cerebellum and medulla presented no changes microscopically.

The existence of chronic hydrocephalus and spina bifida in the same subject is not uncommon, and indeed one would infer that in this particular case the hydrocephalus was present in fœtal life, and by pressure of the fluid on the medulla contributed to the arrest of development of the vertebral arches at the end of the spinal column. Dr. Gibney was quite positive, however, that during the first four weeks of life there were no appreciable signs of hydrocephalus.

It was with some misgiving that he operated on the spina bifida in this case. It seemed, however, that if pus were contained within in the sac the child was doomed, and he could see no good reason for not operating. In searching the literature of the subject he found that he had good authority for such a procedure. Dr. Gibney then quoted cases reported by Mr. Robert Howsen and Mr. Mayo Robson. Considering the anatomy of spina bifida it would seem that excision of the sac is limited to a comparatively small number of cases. Mr. R. W. Parker, member of the committee to investigate this subject, says that in over one hundred specimens examined in the museums of the London hospitals, ninety-five per cent. contained some part of the cord within the sac. According to Professor Humphrey, of the University of Cambridge, it is pretty well demonstrated that in the large percentage of the cases, not only the cord but the spina bifida, are contained within the wall of the sac.

Case 2.—A female child, three weeks of age ; spina bifida in the sacral region ; the child well developed and otherwise free from deformity ; tumor sessile, and about the size of a small tomato, smooth, and covered with reddish-blue membrane. Dr. Gibney treated the tumor by compression for nearly two weeks, but then aspirated it, removing a drachm and a half of clear serum. He repeated the operation six days afterward, removing only about half a drachm of serum. Six days subsequently, with the assistance of Dr. L. Emmet Holt, he withdrew two ounces of serum by means of the aspirator, and injected with the hypodermic syringe a half drachm of the following solution : ℞ Iodin. resub., gr. x. ; potass. iodid., ʒ ss. ; glycerina, ℥ i. The operation was performed with the child in the dorsal decubitus, the puncture sealed with collodion and cotton, a smooth compress applied, and the child kept in this position for forty-eight hours. No untoward symptom developed. Ten days afterward the tumor was one half its original size, and the tissues were denser, and there was no translucency. Ten days subsequently the cure was complete, and the case was dismissed. Four months afterward there was only a hard, flattened, cicatricial mass where the former tumor had existed. Three days subsequently the child died of cholera infantum, and no autopsy could be obtained.

One would think that the injection of the sac would be dangerous, and indeed speedy death had in some instances followed the operation. Remembering, however, the anatomy of spina bifida, so well demonstrated by Prof. Humphrey, it is easily seen how harmless the fluid may be. He states, when speaking of this treatment: "You will perceive that the separation of the cavity of the sac from the cavity of the arachnoid in most instances is some security against the direct passage of the injected fluid into the latter cavity, and that the advantage of Morton's fluid as an injection probably depends upon the addition of glycerine to the iodine and iodide of potassium, lessening the liability to the diffusion of those irritating substances through the delicate lining of the sac into the surrounding subarachnoid tissue."

Dr. Gibney concluded his paper by saying that in view of the anatomy of spina bifida the plan advocated by Mr. Morton, of Glasgow, seemed to be altogether safer than excision, and also more scientific. With good surgical judgment to guide one, and a knowledge of the parts implicated, the majority of cases of spina bifida ought to be amenable to treatment.

Remarks on Dr. Gibney's Communication.

The PRESIDENT asked those who had had opportunity to examine such cases whether they had noticed dilatation of the aqueductus Sylvii or Iter. He thought he had noticed in reports of hydrocephalic cases that this particular passage seemed to resist dilatation.

Dr. L. C. GRAY read a paper "On the Use of Strychnia in Nervous Affection." He referred to a paper read by Dr. Jewell, of Chicago, before the Association in 1879, in which it was claimed that large doses of strychnia, even as much as $\frac{1}{10}$ grain, could be given with gread advantage in myelitis. Dr. Gray had given it in a number of cases, with varying results, but had never found it safe to go beyond $\frac{1}{25}$ of a grain. In two cases, cumulative symptoms appeared, and in one the patient came near dying. In progressive muscular atrophy the drug could be given steadily for a long time, in one case over a year, with the effect of a valuable

stimulant, but not effecting any real improvement. In neurasthenia it acted capriciously—sometimes admirably, sometimes badly. In myelitis of the central type it acted differently in different forms and at different stages. Thus, a chronic myelitis of traumatic origin has greatly improved, as has also another of idiopathic origin ; a myelitis (central), with early implication of the lateral columns, was the one that came near dying ; whilst some cases of poliomyelitis anterior in the early stage were badly affected by it.

Remarks on Dr. Gray's Communication.

Dr. C. L. DANA.—I have had some rather interesting experience in the use of strychnia in some of the functional diseases of the nervous system lately ; I have had under observation lately three patients to whom I have been giving large doses of strychnia. One is a case of depressive form of spinal irritation. The patient is about twenty-five years old, and has been obliged to abandon his business on account of physical and mental inability to continue it ; his back gave out, and his head gave out, and he complained of a long train of symptoms seen in such cases. I gave him strychnia in solution, so that fifteen minims equalled a fifteenth of a grain of the drug. He began with that amount, and increased the dose until he took, in twenty-four hours, over a grain of strychnia in three doses (one of a hundred drops, one of sixty, and the third of thirty). Then he began to feel some effects of the drug—incoördination and palpitation,—and he had to lie down. But those symptoms soon passed off. I then reduced the dose, and he took about sixty drops three times a day for four or five weeks. He says he had never received as much benefit from any other medicine. He has on the average been taking over three quarters of a grain of strychnia daily for over four weeks, with great benefit. There might be some question whether the drug was pure, but I asked the druggist about it, and he assured me that it was, and I tried the drug and found that a dose of a fifteenth of a grain would affect me, though it is an amount which I can generally take without inconvenience.

In the two other cases I ran the dose up until the patients took from an eighth to a sixth of a grain three times a day, and I can also recall other cases in which I have given about that amount. I have found that there are a good many cases of what formerly would have been called spinal anæmia or a depressed nervous condition, in which these large doses can be borne, the patients claiming greater benefit than from any other drug. I think, therefore, that our ideas upon the subject of dosage of strychnia ought to be somewhat modified. I appreciate that it is a dangerous drug to deal with. I know that Nothnagel and some others claim that it is cumulative in its effects. If given in pill form it would certainly be dangerous to give it in increasing doses. But I do not think there is any danger if the patient be an intelligent man and the doctor cautions him. Certainly I have never seen the cumulative or explosive effect of strychnia in any of the cases in which I have administered it.

The physiological effects, or the symptoms which I have noticed, have in some cases been interesting. In some cases I have seen large doses take away that pain and weariness in the back and back of the neck which are so early and constant symptoms of exhaustion. In other cases the drug has imparted tone to the sexual system. It produced remarkable effects in relieving insomnia in one patient to whom I gave it. Bromides and other remedies had failed.

Dr. E. C. SEGUIN: It seems to me we have not made very much advance upon our former knowledge of the dosage of strychnia. I was taught a good many years ago by Brown-Séquard the same ideas I have heard expressed this afternoon. That is to say, in functional affections, more particularly spinal anæmia, patients can take very large doses of strychnia and get well. I have followed that plan of treatment taught by Brown-Séquard in cases of spinal irritation, giving the first week a thirty-second of a grain, the second week a twenty-fourth of a grain, and so on, and have frequently given a fifteenth and even a twelfth of a grain three times a day. With few exceptions in which the patient showed an idiosyncrasy, no unpleasant effects were produced. My experience has been like that of Dr. Dana,

there being extraordinary benefit in both males and females.

With reference to Dr. Jewell's method, I agree with Dr. Gray that it is pretty uncertain and risky practice because of the doubt in diagnosis in many cases. I suggested at the time Dr. Jewell brought his cases before the Association that possibly the reason why he did not get the tetanic symptoms of large doses of strychnia was that his patients had lost the gray matter which when excited produced tetanus. There may have been no central motor apparatus to respond to the large doses of strychnia which he gave. But in cases of transverse myelitis and some cases of central myelitis I have found strychnia illy borne, tetanus being induced by moderate doses, and I have not really dared to carry out Dr. Jewell's treatment thoroughly in any one case. In the treatment of chronic cases, such as those of muscular atrophy and poliomyelitis in the stationary or progressive stage, I have used it moderately and with not over-satisfactory results. I have been in the habit of giving strychnia hypodermically, and have in that way avoided possible errors and have been better able to watch the effect of the drug. In a recent case in which a competent physician had diagnosticated locomotor ataxia, there being certain ataxic symptoms and atrophy in some of the muscular groups, but which I thought was of a functional nature—a neuromimesis,—I gave one fifth of a grain of strychnia once a day without the slightest symptom of poisoning, and with very rapid improvement, as shown by the dynamometer and also by the patient's increased vitality, endurance, and hopefulness. The patient entirely recovered within a few weeks. Indeed I have been led by experience to believe that in many cases the toxic effects of strychnia with small doses might aid us in making a diagnosis betweeen organic and functional diseases of the spinal cord.

The PRESIDENT asked Dr. Seguin whether he regarded the hypodermic administration of strychnia as particularly useful in avoiding its cumulative effects.

Dr. SEGUIN: I have never seen the cumulative effect. In the case of a patient of mine in Pennsylvania, however, the

doctor gave a hypodermic injection of strychnia, and was afterward sent for in great haste because of the apparent toxic effects of the drug. But in that case there was possibility of error. The patient was a hypochondriac, suffering from a form of hysteria with imaginary motor trouble. I strongly suspect that the symptoms were more subjective than objective.

Dr. GRAY: In the case of transverse myelitis with secondary contracture the cumulative effects of the drug were produced by its administration in solution. In the other case reported it was given in pill form.

The PRESIDENT then read his address on "Paronymy *versus* Heteronymy as Neuronymic Principles."[1]

Discussion was indefinitely postponed.

Third day, afternoon session.

The President, Dr. B. G. WILDER, in the chair.

The minutes of the previous meeting were read and approved.

Present—Drs. Wilder, Weber, Seguin, Spitzka, Rockwell, Amidon, Jacoby, G. M. Hammond, McNutt, Starr, G. B. Massey, Dana, and Birdsall.

Dr. E. C. SPITZKA then read a paper on "The Relation between the Symptoms and the Lesions of Posterior Spinal Sclerosis."

You are aware that the distribution of the lesions in this disease are not uniform; that in some cases; involvement of the column of Goll is an early, in others a late occurrence, that the direct myelo-cerebellar tract is nearly free in most, and grossly degenerated in a few sufferers from this affection, while special segments of the posterior columns appear to enjoy an almost complete immunity from the destructive process. Let us see whether there is any constant relation between the variation in prominent symptoms, and the variation in the distribution of the lesions in special nerve-tracts.

The cases on which I have based this study are derived from Strümpell, Kahler-Pick, Démange, Hebold, Leyden, Westphal, Babesiu, Takács, Sioli, Wolff, Schultze, Buch, and my own, including one of McBride's, of which I received the specimen from him, for this analysis.

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[1] See JOURNAL N. AND M. DIS., vol. xii., p. 269, 1885.

The initial lesion of this disease is either in the posterior gray horn or in that part of the column of Burdach traversed by the inner division of the posterior roots as they reach the level of entry into the gray substance. The intensity of the primary lesion is probably in proportion to the rapidity of the development of the disease. It certainly must be regarded as distinct from the true secondary degenerations complicating it. The sclerosis of the column of Goll, the analogous changes in the columns of Clarke, and of the direct myelo-cerebellar tract exhibit a true system-limitation, one which the so-called "root zones" or *bandelettes externes* fail to manifest. I am aware that excellent authority abroad may be cited in favor of the view that the sclerosis of the middle portion of the column of Burdach is a systemic affection. But inasmuch as this part of the posterior column is not made up of fibres of an uninterrupted continuity, it seems difficult to regard it as a system, analogous to the pyramid, the myelo-cerebellar, or the Goll tracts. There is equally good authority for regarding the disease of the middle area of Burdach's column as a slow sclerotic process—whether it be consecutive to the irritation of degenerating nerve tubes as Ranvier claims, or primarily inflammatory as Rumpff asserts, and which for syphilitic cases at least my own preparations sustain. The trabeculæ of connective tissue—dragged in, so to speak, with the posterior nerve-roots—are particularly dense in the lumbar portion of the cord. It may be for this reason that the originating morbid influence concentrates its destructive effects in the so-called posterior *processus reticulares*. At all events such is the fact. It is within this area that certain fasciculi of the posterior roots give off both ascending and descending fasciculi—fasciculi which in transverse lesion of the cord, degenerate for short distances cephalad, and shorter distances caudad. It is reasonable to suppose that this overlapping of ascending and descending root-fibres, associated with the presence of an extra amount of connective tissue, imbedded as this fibre maze is in that part of the cord which is farthest removed from its lymphatic emunctories, affords every temptation to the extension of slow inflammatory trouble. We consequently find that the lesion of the "primary field" remains limited to particular segments of the cord for years, and where the affection was of the "ascending" and not of the "simultaneous" type invades the next segments above in lesser and lesser intensity. Not so, however, with the consecutive sclerosis of the columns of Goll and Foville. If affected intensely at their caudal portions these tracts are found diseased to nearly the same degree and extent for their entire or nearly their entire length, following in this respect the true secondary degenerations. The strongest reasons for regarding the degeneration of the column of Goll in tabes as a true secondary process, due to the cutting off of its nerve supply by the degeneration of the posterior nerve-roots or their gray depôts, are the following: When the lesion of the primary field is limited to the lower lumbar and sacral part of the cord, the

degeneration of the column of Goll is limited to its postero-internal border, when the upper lumbar and lower dorsal segment is involved, the column becomes affected nearly in its entity; and when the cervical enlargement is profoundly diseased, an area, lying just laterad of the column of Goll, and which from its cerebral destination may be regarded as its brachial homologue, presents the same morbid condition. In other words, the projection of the sciatic nerve, is in the postero-internal field of Goll's column; that of the crural nerve, more ventrad and laterad in the same column; that of the brachial plexus (and possibly of the dorsal nerves), in the comma-shaped area of Burdach's column, immediately adjoining it.

In all advanced cases of tabes the affection of the column of Goll is in direct proportion to the altitude of lesion in the primary field. Symptomatically it bears an equally direct and constant relation to the degree of motor ataxia. With no case of total degeneration of the column of Goll, do I find motor co-ordination of the local extremities unimpaired; with no case in which there was additional motor ataxia of the arms for any length of time, do I fail to find the comma-shaped area of the column of Burdach uninvolved.

I consider it scarcely necessary to review the opinion of Strümpell, that the lesion of the column of Goll is in relation with the bladder disturbances of tabes.

If the disease of the column of Goll were a primary systemic affection independent of the disease of the root-field, it would be difficult to understand why the likelihood of finding a corresponding degeneration of the direct cerebellar tract increases with the extent to which the former is involved. It is easy however to understand this coincidence, when we bear in mind that both are under the trophic dominion of posterior nerve-roots.

It is in harmony with this fact that static ataxia is found in advanced, or in originally intense, cases of tabes.

Although it be not clearly expressed, the opinion seems to prevail, that the column of Goll degenerates in consequence of a low transverse lesion of the cord. Yet it is not difficult to recognize a difference between the lesion of the tract which corresponds to the column of Goll in the lumbar cord, and the general disease of the posterior column; in many of the plates, the deeper shade of the triangular field, as some have called it, can be distinctly recognized, though the reporters have not accentuated this feature. In the specimen exhibited it is very distinct; it corresponds exactly with the ascending degeneration following compression of the cauda equina, and also with a field which, in a well-preserved fœtal cord submitted to me by Dr. Chauveau, I found to coincide in its myelinic development with the column of Goll, while the field thus designated—with some reservation—by Flechsig, did not so correspond, and remains singularly free from disease in locomotor ataxia. As illustrating the bearing of the lesion of the column of Goll on the motor ataxia, I may refer to two cases

related in juxtaposition by Strümpell. As far as the lumbar segment of the cord is concerned, the distribution of the lesion is similar; in the one without marked ataxia, the triangular field was slightly diseased, and there was no upward extension of the lesion in the column of Goll. In the other with marked ataxia, the triangular field was intensely diseased, and ascending degeneration in the sciatic field of the latter.

In support of the fact, that the comma-shaped area in Burdach's columns is homologous with the fibres of the column of Goll, it is to be advanced, that degeneration of this field bears the same relation to symptoms in the distribution of the ulnar nerve that degeneration of the column of Goll bears to sciatic and crural symptoms. Where the initial pains and subsequent tactile and locomotor disturbance were severe, this field was found affected, and most so on the side where the symptoms had been most intense. This area has no direct connection with the root-fields. Secondly, in primary system-disease of the column of Goll, associated with degeneration of the nucleus of the column of Goll, an irregular encroachment of the column of Burdach was noted. Third, the innermost fibres of the column of Burdach, (those belting the nucleus in the oblongata) have the same relation to the interolivary layer, which the column of Goll has through its provisional nucleus of termination.

While the evidence of high lesion of the cerebral continuation of the column of Goll, and what I regard as its homologue, the comma-shaped area of Burdach, together with the constant association of marked degeneration of these columns with motor ataxia, is strong positive proof of its relation to this symptom, there is equally strong evidence negativing its relation to any other of the prominent symptoms of tabes dorsalis. Thus Babesiu found degeneration of the posterior columns limited to the column of Goll, and the patellar reflex was not destroyed; the root-fields at the upper lumbar levels were intact. That the columns of Goll have been found profoundly affected without bladder disturbances, has been stated previously, and constitutes a stronger argument against Strümpell's view, than the frequent observation of bladder trouble in spinal diseases with which these columns are entirely free.

Almost the same remarks apply to the relation between static ataxia and the rarer disease of the direct cerebellar tract and the more common affection of the column of Clarke, though the proof is not as ample. The experiments of Woroschiloff and Schiff show that in animals in whom lesion of the pyramid tract is not followed by such profound disturbance as in man, the outer parts of these columns have some relation to co-ordination. The cases of tabes in which either the columns of Clarke, or their cephalic continuation, the tracts of Foville, are degenerated, are advanced cases of the disease, as a rule; and then, as far as ascertainable, both varieties of ataxia were developed. In Friedreich's form of so-called tabes the myelo-cerebellar tract is more apt to be degenerated, and the ataxia is correspondingly of the static variety as

well as of the motor. In one case of profound degeneration of this tract the ataxia is described in terms applicable to cerebellar disturbance. The negative arguments, to which, for reasons to be mentioned, less importance attaches, show that the muscular sense and visceral functions may be disturbed, the patellar reflex absent, the bladder trouble, anæsthesia, and analgesia profound, and yet the columns of Clarke and the tract of Foville be sound ; on the other hand, these tracts may be entirely destroyed without affecting the patellar reflex or the visceral functions. But the valuable case of Senator, in which the cephalic continuation of Foville's tract was destroyed on one side, exhibited a disturbance of the space-sense analogous to that of cerebellar disease. It is the bilateral involvement of this tract which I think renders the cerebellar character of ataxia in advanced tabes so little evident.

The most constant finding, in this analysis, relates to analgesia. Strümpell already noticed that among the divisions of the posterior columns which presented a peculiar immunity to the pathological process, was an area, bordering on the entry line of the posterior roots and the posterior gray horn with one side, and on the periphery of the cord with the other. In a few cases this area was profoundly affected. In the ordinary class there were fulgurating pains, hyperæsthesia, and delayed pain-sense conduction, as in most cases of tabes. In the latter class there was complete analgesia. Now it might be argued against the attributing to this tract of a relation to pain-sense conduction, that naturally in the course of a progressive destroying disease, the phenomena of irritation and hampering of a function will be followed by its abolition. I have, however, here a specimen in which the lesion was remarkably limited : the primary lesion of the root-field ceased in the lower dorsal cord ; the ascending degeneration of the column of Goll was limited to the sciatic field (as I have termed it), and barely identifiable in the cervical region. The " analgesia " area is exceptionally diseased and to a high degree, altogether in disproportion to the disease of the root-fields and the gray substance. The patient, who had been carefully observed by Dr. McBride, had pronounced analgesia of the lower extremities, out of proportion, I think, to the severity of his trouble, generally speaking ; he died of intercurrent disease.

The field of the column of Burdach adjoining the head of the posterior horn in the oblongata is continued in the reticular field of the tegmentum ; lesion here produces abolition of the pain and tactile sense on the opposite side of the body. This much may be affirmed from the cases of tabes reported : in no case in which there was any degree of analgesia were these parts of Burdach's columns healthy, and in no case where they were diseased was the pain-sense preserved.

The symptoms attributed to lesion of the *bandelettes externes* are familiar to all students of Charcot's and Westphal's writings, modifying the location of these bands so as to limit their extension to the periphery. It is now generally conceded that the abolition of

the patellar jerk is due to this lesion at the upper lumbar level. Tshirjew has shown that the translation of this reflex occurs in one level of the cord, and a distinct fasciculus may be seen coursing from the innermost root-fibres toward the entero-intermediate cell-group of the anterior horn ; it furnishes a pictorial substratum, if not anatomical proof of the physiological observation. The abolition of the tendon reflexes in the upper extremities ensues with lesion in the corresponding field of the lower part of the cervical enlargement, the exact level not being sufficiently demonstrated by a number of comparable cases. Starr, in his summary, locates the elbow tendon reflex in the level between the fifth and sixth cervical roots, and the wrist tendon reflexes between the sixth and eighth. This is probably correct, as the more remote a motor or sensory periphery of the upper extremity is from the trunk, the lower down will be found its nuclear representative—and that is tantamount to its lower reflex arch.

It was formerly believed, following the clear dictum of Schiff, that retardation of pain-sense conduction was proportionate to the degree of involvement of the gray substance. The profound atrophy of the gray posterior horn in advanced tabes seemed to justify an application of the experimentally obtained fact to tabes dorsalis. Still one objection to attributing delayed pain-sense conduction to the gray substance existed before Erb called attention to the occurrence of this symptom in peripheral disease. Schiff found that pain-sense conduction continued even if very small areas of the gray matter escaped destruction ; in tabes there is never total destruction of the gray substance, large areas escaping. Consequently, the occurrence of analgesia, preceded by delayed pain-sense conduction, would have, in addition to the assumed lesion of the gray, to be supported by a lesion in the white substance—one intense enough either to cut off all the centripetal roots, or the cephalic conductors.

Immediately adjoining the gelatinous head of the posterior horn, there is a column of vertical fibres, which bears an analogous relation to that exhibited by the ascending root of the fifth pair in connection with the gelatinous substance of the *tuber cinereum* of Rolando. Sclerosis of the ascending trigeminus roots has been found in tabes, and in such cases trophic disturbances were marked; thus in Démange's case the teeth dropped out of the upper jaw. In other cases, with and without autopsies, ataxia of the facial muscles was found associated with trophixlesions in the trigeminal distribution ; and it is to be borne in mind that the facial ataxia was attributed to the affection of this root of the fifth pair. If there be a functional analogy between the fibre systems of homologous location to the supposed trophic (?) root of the trigeminus, we may yet find, in the comparative degree of involvement of this tract, some explanation for the variation in trophic symptoms. I am, from the cases examined, only able to say that where there were no trophic disturbances this tract was healthy, but I also found it unaffected in that class of cutaneous lesions which are directly related to the fulminating pains.

In addition to the "analgesia tract," which is but exceptionally involved in tabes, Strümpell found that a deeply situated area of Burdach's column, bordering on the posterior commissure, and which repeats itself in the brachial and lumbar enlargements, presents a remarkable immunity to the disease process.

I am aware that a number of arguments may be advanced against the establishing of a connection between the lesion of the posterior segment of the cord and locomotor ataxia. Westphal, for example, says that lesion of these columns will be found much more frequently when examinations of the cord shall no longer be limited to those cases where disease is suspected from the existence during life of ataxia. He found extensive disease in sufferers from paretic dementia, who did not exhibit the characteristic gait of the tabic patient. But where he could establish the precedence of the organic trouble in the spinal cord, true locomotor ataxia had been present before the insane manifestations exploded. This fact alone seems to prove that the destruction of cortical control is inimical to the development of typical ataxia. Leyden has expressed an opinion in the same direction, when he attributes the lesser manifestness of locomotor ataxia in the female to the inferior cerebral organization. But a more convincing proof in this line is the fact that in proportion as coincident disease cuts off the centrifugal tracts in a posterior sclerosis, the ataxic symptoms become less palpable. This is a frequent observation with the combined forms of sclerosis.

With regard to the very symptom which, at an earlier period was supposed to have a most constant relation to the lesion of the posterior columns, the tactile anæsthesia, the results of this comparative study were least satisfactory. Beyond the confirmation of Strümpell's conclusion, that the columns of Goll, of Clarke, and the direct cerebellar tracts have no connection with tactile transmission of any kind, I am unable to advance propositions.

In the lumbar cord there is a molecular tissue extending in from the entry groove of the posterior roots, and reaching to the gelatinous head of the posterior horn, which embodies spherical nerve cells, and is altered in one case of tabes in my own series. I can find no clear description of this substance anywhere. Although I am unable to attach any special significance to this finding, yet I venture to hope that with the improved methods of histological analysis, devised during the past twelvemonth, attention will be given to this area. It is, from its close relations to the posterior roots, probably of some pathological if not of intrinsic physiological importance.

While it must be admitted that the primary lesion of tabes is competent for each affected level of the root-zones and gray horns, to produce all the characteristic symptoms of tabes referable to that level, yet in the extent and distribution of the consecutive lesions we have valuable gauges of the extent, severity, and duration of the primary disturbance, and we may attribute to the following special disturbances, the ensuing degeneration of the tracts, whose functions are abolished or diminished :

1st.—That of the column of Goll, to the disturbance of muscular sense in the lower extremities.

2d.—That of the comma-shaped internal bands of the column of Burdach, to the corresponding disturbance in the upper extremities.

3d.—That of the triangular area, bordering on the periphery of the cord and the posterior root-entry, to the rarer analgesic development.

4th.—That of the column of Clarke and direct cerebellar (Foville's) tract, to the disturbed space-sense.

The specimens exhibited, Dr. Spitzka stated, were prepared by two methods: one, the ordinary staining of sections as met in ammonio-carmine; the other, of whole segments of the spinal cord. In the latter, the degenerated fasciculi alone imbibed carmine to any appreciable extent; thus the degenerated areas were more distinctly demarcated than by any method in which sections are stained as a whole. Sections prepared by the ordinary methods demonstrated that this demarcation was correct.

Remarks on Dr. Spitzka's Communication.

Dr. E. C. SEGUIN.—Little remains to be said upon a paper which is so comprehensive and analytical as that just read by Dr. Spitzka. I can only express my opinion that it summarizes very well the present state of our knowledge as to the relations which exist between tabes and its symptoms. I would add one series of observations, which are physiological, to the pathological ones, and would ask the author of the paper what possible light they may throw upon the initial lesion of tabes. I refer to the insusceptibility of tabetic patients to the sensory disturbances usually produced by aconitia. Five years ago I made the observation (*vide* Transactions of Meeting of 1881), that patients in the first stage of tabes, and also in the second stage, could take very large doses of aconitia without developing the peripheral subjective sensations which are characteristic of the action of that drug upon the spinal axis. Out of the entire series of cases, perhaps twelve, only one patient manifested any tingling sensation in the extremities during the administration of the aconitia; that patient took enormous doses, as much as six one-hundredths of a grain in the twenty-four hours. Two or three of the patients came near dying from collapse, having the general effects of the drug but none of the characteristic sensory effects. I told them to take the

drug until they felt a tingling sensation, which is a safe rule except in tabetic patients. It seems very probable that the tingling produced by aconitia arises from its effects upon the gray matter of the cord, whether by causing a vascular disturbance or a parenchymatous molecular disturbance, I will not venture to say. It has been stated that aconitia acts on the peripheral nerve fibres, but if that were the case, and the nerves were degenerated, I do not see how we could account for the absence of tingling because a very small proportion of the sensory fibres are attacked in early tabes in many cases, as shown by the absence of severe or extensive anæsthesia.

Dr. SPITZKA.—Was there any limitation of this phenomenon?

Dr. SEGUIN.—It was limited to the extremities, as a rule. If, on the other hand, the theory be advanced that the numbness is produced in the gray matter and is then referred to the extremities subjectively, it seems to me difficult to understand the absence of the sensation. Our usual understanding of these subjective sensations is that they take place irrespective of conduction, as shown after amputation, when patients refer sensation to a limb which is absent. It seemed to me from these observations, which are very incomplete and need to be repeated, that there was possibly a physiological proof that there is an early change in the gray matter, perhaps in that part of the gray matter to which Dr. Spitzka has referred as constituting a portion of the posterior horn.

Dr. SPITZKA.—I suppose that in Dr. Seguin's cases the absence of tingling sensation existed only in the extremities, and not, for instance, in the face.

Dr. SEGUIN.—As I remember the cases, there was no tingling or numbness produced at all. Certainly in most of the cases there was no numbness in the lower extremities. In many of the cases there was none in the face.

Dr. SPITZKA.—I agree with Dr. Seguin that from analogy we would infer that the aconitia had not produced sensory symptoms because of change in the gray matter rather than because of a change in the nerve-ends. I do not believe

there is a single drug of that class which acts upon the peripheral extremities of the nerves. Perhaps the question could be settled by first giving the aconitia in peripheral nervous trouble, and seeing if transmission would be interfered with. I believe that all these paræsthetic and analogous phenomena have their seat in the gray substance, and for that reason I am inclined to think the initial lesion of tabes is in the gray substance, if not in the posterior roots, because these symptoms predominate in the prodromal stage of tabes.

Dr. SEGUIN.—In certain classes of cases that is true. I have recently seen a patient who had had no pains. He was very certain about that fact. He had had a sense of coldness with crawling in patches, but he denied having had pain in the ordinary sense of the word. His tendon reflexes were absent. He was evidently in the beginning stage of tabes.

The PRESIDENT then read a paper entitled "A Seldom Described Artery (A. termatica), with Suggestions as to the Names of the Principal Encephalic Arteries."

In all the human brains examined in the anatomical laboratory of Cornell University, in which the arteries were preserved and injected, there has been found the small artery which is shown in the preparation exhibited, and represented in my paper on "Encephalic Nomenclature" (*N. Y. Med. Jour.*, March 21, 1885, pp. 325, 327, figs. 1, 3). In that paper it was named *Arteria termatica* (termatic artery), from its location just cephalad of the terma (*lamina terminalis* or *l. cinerea*), which it also supplies with small branches. Its origin will be described presently. It usually divides soon into a right and left portion, which supply respectively the cinerea forming the surface of the triangular area ventrad of the genu and rostrum, and then extend around the genu to the dorsal aspect of the callosum. The ultimate distribution has not yet been determined. The artery merits notice, both because it is *mesal* or *azygous* at its origin, and because, so far as I can ascertain, it has never been named or described, or accurately figured, although a few authors represent some short vessels as given off from the place of origin of the termatic.

In making notes of observations upon this artery, I found somewhat irksome the repetition of even the abbreviations of the dionymic names commonly applied to some of the arteries at the base of the brain, and substituted the following mononyms, which I venture to recommend to this Association. The names *vertebralis* and *basilaris* need no improvement. With all the Latin names, of course, the word *Arteria* is understood, or its abbreviation A., and after the English paronyms the word *artery*. The method of converting dionyms into mononyms is that which was first so aptly applied by Owen to the great veins, *præcava* and *postcava* (permitting the use of adjectives *precaval* or *postcaval*), and adopted by me for the encephalic commissures and some other parts in 1880 (see also "Anatomical Technology," pp. 14, 484, 485).

Common Latin names.	Proposed names.	English paronyms.	Abbreviations.
Vertebralis.	Vertebralis.	Vertebral.	*vrtb.*
Basilaris (*az.*)	Basilaris.	Basilar.	*bslr.*
Cerebellaris anterior.	Præcerebellaris.	Precerebellar.	*prcbl.*
Cerebellaris posterior.	Postcerebellaris.	Postcerebellar.	*pcbl.*
Cerebralis anterior.	Præcerebralis.	Precerebral.	*prcb.*
Cerebralis media.	Medicerebralis.	Medicerebral.	*mcb.*
Cerebralis posterior.	Postcerebralis.	Postcerebral.	*pcb.*
Communicans anterior (*az.*)	Præcommunicans.	Precommunicant.	*prcm.*
Communicans posterior.	Postcommunicans.	Postcommunicant.	*pcm.*
Choroidea anterior.	Præchoroidea.	Prechoroid.	*prchrd.*
Choroidea posterior.	Postchoroidea.	Postchoroid.	*pchrd.*

I have no name to propose for the very awkward dionymic eponym, *Circulus Willisii* (circle or pentagon of Willis), but one is certainly desirable.

In six out of seven brains examined for the termatic artery, it was found to spring only once from a distinct precommunicant artery uniting the precerebrals, as commonly described. In the other cases, as in the preparation exhibited, it arose from the place of junction of the precerebrals, the precommunicant being wholly absent. The precerebrals are joined for only a few millimeters, and then separate again to follow their accustomed course.

Remarks on Dr. Wilder's Communication.

Dr. M. A. STARR, of New York: I would like to state that the anomaly which Dr. Wilder has spoken of, absence of the præcommunicant artery, is one that I have noticed twice within the last year in the demonstration of fourteen brains. If Dr. Wilder has found absence of the artery in five cases out of six it is rather a remarkable fact. The arteries were not injected during my demonstrations, and I did not notice the new artery spoken of.

Dr. WILDER next made a communication "On Two Little-Known Cerebral Fissures, with Suggestions as to Fissural and Gyral Names."

In all adult human brains examined with reference to them in the anatomical laboratory of Cornell University, there have been found, more or less distinctly marked, two fissures which are seldom figured or described, but which probably have considerable morphological significance.

The one indents the dorsi-mesal margin just cephalad of the precentral fissure and paracentral lobule. In the brain exhibited (from an adult mulatto) it is particularly distinct, and is shown in the outline figure in the *N. Y. Med. Jour.*, Feb. 23, 1885, Fig. 42. It seems to have been described by Lussana and Lemoigne ("Fisiologia dei centri nervosi encefalici," Padova, 1871) under the name of *inflesso;* paronymized, in Latin this becomes *fissura inflecta*, and in English the *inflected fissure.* At first glance it strongly suggests the cruciate fissure of the Carnivora, especially when the branches of the precentral, border what resembles the sigmoid gyrus; but such a homology must not be admitted without further investigation. For some of the difficulties involved see the Transactions of this Association for 1883, p. 63.

The other fissure is likewise well developed upon the brain exhibited, which was hardened within the skull by arterial alinjection, and hence escaped the injury and distortion which are sometimes inflicted upon the base, during the ordinary processes of removal and preservation. The fissure appears upon the meso-ventral aspect of the temporal lobe, near its tip, extending caudad for 1–3 cm. from the horizontal portion of the Sylvian, between the neutro-cephalic ends of the

hippocampal and collateral fissures. My attention was called to it this spring, and its constancy, and its relation to the Sylvian fissure and the insula led me to homologize it with the postsylvian portion of the fissure which, in the cat, for example, forms the dorso-lateral margin of the tract continued caudad from the olfactory lobe and crus. In man and other primates the great development of the insula and of the true cerebral portion of the hemisphere throws the fissure upon the neutro-mesal aspect, but, there is no essential change in its relations with the parts above named. Later I found that this homology had already been recognized by Owen and Broca in their naming of the fissures of the human brain. Owen's prior name is *basirhinal;* the name employed by me ("Anatomical Technology," p. 496, and elsewhere) is *postrhinal.* If it can be shown to have a constant relation with a constant ental part, the *amygdala*, a name derived therefrom, like *amygdaline*, may be found preferable.

As to the names of the fissures and gyres, on the assumption that, excepting the hypocampal, callossal, rhinal, and part of the Sylvian, all which have definite relations with ental structures, it may be long before the homologies between the primatial and carnivoral parts are satisfactorily determined, I make the following suggestions:

1. That all the indentations of the cerebrum be called *fissures* (abbrev. F.), and this word be restricted thereto.

2. That, excepting a few parts (*insula*, *cuneus*, *præcuneus*, *paracentral lobule*, *uncus*, *subiculum*, *operculum*, etc.) which have received special names, all the interfissural elevations be called *gyres*, Latin *gyri* (abbrev. G.), and that this word be restricted thereto.

3. That, so far as possible, mononymic names for the fissures and gyri be selected from among those which are in use, or formed therefrom by substituting prefixes for words indicating relative position.

4. That in a few cases ambiguous descriptive names be replaced by words indicative of position, relative to other parts having well-established names.

5. That *insula* be preferred to *lobus centralis*, and *central fissure* to *fissure of Rolando.*

6. That the name *Sylvian fissure* be applied only to that portion of the human fissure which is commonly present among other mammals (the "horizontal" or "posterior" branch).

7. That besides the true operculum (between the "posterior" and "anterior" branches of the "Sylvian"), three other opercula be recognized and designated by names indicative of relative position.

In accordance with the above suggestions I have selected or formed the following names for the principal human fissures and gyri. The words here employed are the English paronyms of the corresponding Latin names.

I.—Fissures, mainly or partly mesal.

Callosal, supercallosal, inflected, paracentral, precuneal, occipital, mediоccipital, suboccipital, calcarine, postcalcarine, collateral, amygdaline.

II.—Gyres, mainly or partly mesal.

Callosal, paracentral lobule, precuneus, cuneus, postcalcarine, subcalcarine, subcollateral, hippocampal, uncus, subiculum.

III.—Fissures, mainly or partly lateral.

Sylvian, presylvian, subsylvian, basisylvian, olfactory, triradiate, central, precentral, superfrontal, medifrontal, subfrontal, postcentral, parietal, supertemporal, subtemporal, intermediate.

IV.—Gyres, mainly or partly lateral.

Operculum, preoperculum, suboperculum, postoperculum, insula, subfrontal, medifrontal, superfrontal, precentral, postcentral, parietal, marginal, angular, supertemporal, meditemporal, subtemporal, superoccipital, mediоccipital, suboccipital.

The paper of Dr. Wharton Sinkler, of Philadelphia, on "Two Cases of Friedreich's Disease," was read by Dr. Massey, of Philadelphia:

The two cases which I shall relate resemble in many respects the so-called Friedreich's disease, but in both is wanting one characteristic feature—namely, the hereditary or congenital history. In all of the cases reported by Friedreich there were two or more instances of the disease

in the families to which the patients belonged. Gowers reported five cases of this form of ataxia in a family of nine children.

The cases of Friedreich and Gowers are not, strictly speaking, hereditary, for neither the parents nor any of the ancestors, as far as known, were ataxic. Cases are on record, however, which are hereditary; for instance, those of Carré, reported by Broussi, in which of twelve children seven were ataxic; the mother was ataxic, and her brothers and sisters, eight in number, as well as one cousin, were also affected with ataxia.

As far as I can discover, none of the progenitors of either of the cases which I report are ataxic. The brothers and sisters also appear to be healthy in all respects. I am indebted to the kindness of Dr. Weir Mitchell for the opportunity of reporting the following cases.

Dr. Sinkler then gave the history of two cases of this disease.

These cases, with certain exceptions, are decidedly like locomotor ataxia, but the ordinary form of this disease is very unusual in children. Hammond says it is met with between thirty and forty-five years of age. Eulenburg in 149 cases found but one instance (female) under ten years of age. Erb, out of eighty-six cases of his own, met with three instances between eleven and twenty years.

In a "Critical Digest of the So-Called Hereditary Ataxia, First Described by Friedreich," by Dr. J. A. Ormerod, the writer has collected forty cases of this affection. This author remarks of the disease, that its most striking feature is its tendency to attack many members of the same family. Next, that it attacks in early life. "Friedreich stated that it coincided with commencing or developing puberty, the dates of his cases varying from æt. 13 to æt. 18, but other authorities have observed it still earlier. Thus of Rutimeyer's cases it began above the age of four years (one child indeed had never been able to see straight); and in two of Hammond's cases at a similarly early age." The first symptom is almost invariably ataxia of the legs, then it gradually extends up, affecting the arms, head, and,

finally, the speech. Nystagmus also occurs late in the disease. The absence of sensory symptoms is of great interest. In typical cases of locomotor ataxia the pains, as is well known, are a prominent symptom, especially in the early stages; and later on, sensory disturbances—anæsthesia, paræsthesia, etc.—frequently are present. In Friedreich's disease "pain is conspicuous by its absence." "Romberg's symptom"—*i. e.*, inability to stand with the eyes shut and the feet together—is not always present, but the knee phenomenon is always absent; spinal curvature is often present. Ormerod says a combination of lateral and angular curvature is frequent, but that lateral alone is more frequent than angular curvature alone. It is said to be a very early symptom. In my patient, Case 2, there is marked lordosis. Indeed, so marked was this condition that on first seeing the case and observing a very stout condition of the calves of the legs in connection with the spinal curvature I suspected it might be a case of pseudo-hypertrophic paralysis.

Paralysis and atrophy come on later in the disease. Many of the cases recorded were under observation for a great number of years. One of Friedreich's was seen by him for thirty-one, and another for twenty-five years. As the disease progresses, the patient becomes utterly helpless from the degree of paralysis.

Post-mortem examinations were made in seven of the cases collected by Ormerod. The following is a résumé of the changes found:

"In several cases the cord and medulla were small in size, and this is certainly a fact of interest when we consider the hereditary character of the disease, for a cord congenitally imperfect may be the more prone to degeneration, and to degenerate at an early age. Advanced posterior spinal sclerosis was found in every post-mortem. The changes in the medulla were slight and apparently secondary to the spinal. So in Friedreich's opinion were those which he found in the nerve-trunks; while in the cerebrum and cerebellum no trace of chronic disease was found."

In conclusion we would recall the difference in the two

different forms of the disease. First, the typical variety begins with lightning pains, disorders of micturition, transient paralysis (especially oculo-motor), absence of pupillary reflex—Argyll-Robertson symptom; visceral crisis; trophic disturbances in the joints and bones. All of these are absent in the form described by Friedreich, and in this latter variety the spread of the affection to the arms is more rapid; the spinal curvature, the disturbance of speech, and the nystagmus are peculiar to it. The early age at which it occurs and the family predisposition to the disease make up the other points of difference.

On the other hand, in both types there are the ataxia and incoördination beginning in the lower extremities, the absence of tendon reflexes "the Romberg symptom," and some of the eye lesions.

Remarks on Dr. Sinkler's Communication.

Dr. SPITZA asked whether there was an autopsy in the two cases reported.

Dr. MASSEY replied in the negative.

Dr. SEGUIN: I have recently published five cases of Friedreich's disease in the *New York Medical Record.* It would perhaps be superfluous to mention the symptoms in those cases except in the briefest way. They presented ataxia of the legs and arms; the Romberg symptom was present; the tendon reflex was absent. There was the progressive characteristic development in early youth, before puberty; in most of the cases decidedly so; in some before the patients had reached four or five years of age. There were three cases in each of the two families. In one of the families one patient had died before I had an opportunity to see her. The point which I think has not been sufficiently treated of by Dr. Sinkler is the distinct paresis and the tendency to contracture which is present in many of the cases. In my own cases the paresis was marked. In a case which I reëxamined about two weeks ago there was pes equino-varus with tendency to contracture of the calf and abnormal tension of the tendo Achilles. The foot could not be brought into normal flexion upon the tibia.

There was increased reflex from the soles, while the patellar reflex was absent. I have been very much impressed in the study of these cases with the absence of pain. It seems to be a rule almost without exception that these subjects have no pain, no anæsthesia. In the celebrated Case 6 of Friedreich, the patient having had the disease thirty-one years, there was no anæsthesia, yet the posterior columns were degenerated as a whole. It seems strange that there should be extensive degeneration of the posterior columns in their different parts and of other portions of the cord without any corresponding irritation or anæsthesia. In the case of the family reported by Dr. Smith before the Massachusetts State Medical Society last week, it was thought that the father had a form of ataxia, although it came on later in life, and there is some doubt as to the real nature of the affection. But the four children certainly had the disease known as Friedreich's disease. Dr. Smith presented one of the children before the Society, and she showed marked paresis and ataxia. There was also a tendency to contracture of the foot. One of the patients died last winter, and the cord after hardening was prepared by Dr. Putnam. I am able to show two sections to the Association, sent on by our Fellow, Dr. Putnam. In these one can see very complete degeneration of the posterior columns, of the cerebellar tract, and of the pyramidal tract. The microscopical examination shows that the pyramidal tract is considerably involved.

With reference to the differential diagnosis of this affection, I think there can be very little difficulty in discriminating between it and disseminated sclerosis. The symptomatology is very typical, whereas in disseminated sclerosis it varies greatly with each case. We have much more decided tremor and quasi-rhythmical tremor in the latter disease. In ataxia the disorder in movement is not a true tremor, but a want of harmony of action between the antagonistic muscles. There was no oscillation of the eyeball, in my cases.

With reference to treatment, I have given two of the patients prolonged treatment with nitrate of silver, iodide

of potassium, and galvanism, without the slightest influence on the disease. The cases progressed, as did the other cases which had no treatment.

I will add one word more with reference to the walk in the cases which I saw. There was ataxia of the lower limbs, but it was a sort of imperfect or irregular ataxic movement, but it was not the typical outward projection and then the forcible heel-stamp of tabetic patients. That fact may be of some value in studying the relation between the lesions and the symptoms.

Dr. R. W. AMIDON.—I think I have under observation two examples of this disease. The one is a girl of eleven years whom I saw last week in consultation. As well as I can recall her history, she commenced to walk very early; I think at the eighth month she walked with the support of a chair. When nine months old she had very severe whooping-cough. Coming out of the whooping-cough she had entirely lost power of progression. This transient paraplegia disappeared completely within three months, and she remained perfectly well, the mother states, up to the age of six years. At that time she began to complain of feeling weak in the legs; she walked in an incoördinate or ataxic manner, and was disposed the latter part of the day to remain perfectly quiet. At the age of seven she had measles, and recovering from the measles her former condition seemed a little aggravated. I saw her last week, at the age of eleven, and her present condition is as follows: She is a very bright girl, and as far as I know is free from any hysterical element. She is believed to be entirely free from any bad habits. She is of normal size. The limbs are very well developed, but there is a feeling in the skin like that described by Dr. Sinkler, as though the skin were not only very thick but were bound down to the subcutaneous tissue. The muscles can be felt very readily under this thick skin and subcutaneous areolar tissue. In the morning the girl gets up and dresses herself and walks about until noon, when she wilts down and does n't walk any more during that day. Her gait is ataxic and stumbling. There are no ocular, vesicle, or rectal symptoms; no pain. I found the muscular reac-

tions to be normal to both galvanism and faradism. The tendon reflex absent.

The other case, which I have not seen for over a year, is that of a girl of five, which I am sure comes under this category of Friedreich's disease described by Dr. Sinkler as not being hereditary. I will endeavor to bring the patient before the Society to-night.

Dr. M. A. STARR—I have very little to say about the section of Friedreich's case in my possession. The case was one of three which Friedreich reported in *Virchow's Archives*. It was a classical case, and one of a number from which the first description of the disease was made. The changes which have occurred in that cord are limited to the posterior columns, to the pyramidal tracts in the lateral columns, and to the direct cerebellar columns of the lateral columns, so that it is really a widespread system of lesions involving three tracts. The cord was also very much deformed in that case; the retraction of the posterior surface of the cord inward making the apparent distance from the posterior commissure to the periphery of the cord very much less than usual. The case was one of three in a family, there being two sisters and one brother. I believe Friedreich regarded it as a case of congenital deformity of the cord, and it is stated that no lesions were found in the brain or cerebellum, which would rather tend to refute the statement attributed to Dr. Hammond, that some lesion of the cerebellum or brain is the primary condition.

Dr. AMIDON.—I would add to my case, that of the girl aged eleven years, that she had a talipes equino-varus, and double tenotomy was performed at the Hospital for the Ruptured and Crippled about two years ago. The tendon Achillis was cut, which, to a certain extent, corrected the deformity, but not entirely.

Dr. JACOBY.—Was hereditary syphilis excluded in Dr. Sinkler's cases?

Dr. MASSEY.—I think syphilis was entirely excluded.

Dr. JACOBY.—Three cases were reported by Hirschberg at the clinic at Berlin, which I think throw some light on the etiology of this affection. Perhaps there were four

cases. They came to the eye clinic, and were found to have atrophy of the optic nerve, and also tabes. It struck me in listening to this paper by Dr. Sinkler that his might be cases of tabes in children. They certainly do not strike me as being typical cases of Friedreich's disease as he describes it.

Dr. GEORGE W. JACOBY, of New York, presented an *absolute galvanometer* and a *rheostat*, both of which have been devised by his friend, Dr. J. Rudisch, of New York; a description of them has not yet been published. The principle made use of in this galvanometer is that first employed by Hirschmann, of employing a pair of astatic needles in a vertical instrument. By this means the magnetic influence of the earth is neutralized, and the instrument may be placed and used in any position of the compass. The manner of construction is as follows: Upon two flat spools, made from rectangular copper tube, is wound a sufficient quantity of No. 32 copper wire to make a resistance of eighteen ohms in each spool, each spool being wound separately, the two together having a resistance of thirty-six ohms. The spools, after having been wound, are fastened to a small ebonite base, and stand with their flat sides against each other. The flat side of either spool may be the front of the instrument. Directly over the top and centre of these spools, at right angles with their flat sides, is a small brass shaft of about one and three quarter inches in length, each end of which is capped by a fine steel point, which in turn is received into an agate provided with a conical polished depression. These agates are set into two adjusting screws, which are supported by two posts of such a height as to allow the shaft to turn freely in its bearings. Upon this needle-shaft, and directly over the opening in the spools, are fastened two flat magnets of thin sheet steel. These magnets are each one inch long and a quarter of an inch wide. Directly under these magnets, at right angles to them, and attached to the shaft by means of a forked end, is a small brass arm. This arm hangs down into the interior of the spools for a distance of half an inch, and upon it and parallel to the magnet are fastened eight other needles, each of which is about $\frac{1}{2}$ mm. in diameter. These

needles are of various lengths, from $\frac{15}{16}$ of an inch to $\frac{1}{4}$ of an inch, each needle forming a proportionate segment of a circle whose diameter is the sheet-steel magnet, at one end of the needle-shaft, to which the two systems of needles are attached, and very near its supporting agate is fastened a fine aluminium pointer, which extends vertically upward, and swings in front of the scale. This scale is supported by two small pillars, fastened into the top of that spool which is the front of the instrument. The instrument is rendered practically astatic by placing the north and south poles of the systems of needles in opposite directions to each other, the systems being treated the same as an astatic pair of needles.

The *rheostat* almost explains itself. Upon a piece of ground glass is spread a quantity of powdered graphite. Over this glass plate a movable piece of graphite is fastened. This piece forms one of the rheophores, the metal post at one end of the glass plate forming another. The graphite is being continually supplied as the pencil is moved. The advantages over the ordinary water rheostat are manifest. No evaporation, no breakage, and no polarization. The resistance of this rheostat, measured a few days ago, was 30,000 ohms. Of course this resistance is always varying, according to the increase or diminution of graphite. If a very large resistance is desired, it may be obtained by rubbing off some of the graphite with the finger, so that only a slight film remains. That we do not always know the exact amount of resistance interposed is no objection, because we are supposed to take the indication of the galvanometer needle as a guide. Thus, by means of increasing or decreasing the resistance of the rheostat, we can easily increase or decrease the deflection of the needle to the desired point.

Remarks on Dr. Jacoby's Communication.

Dr. C. A. DANA.—It seems to me the galvanometer presented by Dr. Jacoby has a scale too small for indicating the strength of current administered through large electrodes. I should think it could be made to give more than twenty-five milliampères.

Dr. M. A. STARR.—In looking at this galvanometer it does not seem to me to offer advantages over a similar instrument recently constructed by Mr. Barrett, of this city. Dr. Rudisch's instrument is evidently very carefully made, and is, as I know from conversation with the maker, a very expensive one. The number of milliampères indicated on Mr. Barrett's instrument is larger. An attachment of a piece of mica aids in correcting the tendency to vibration. With regard to the point made by Dr. Dana, I know it is the habit here to use large electrodes, but in Germany it is found that twenty-five milliampères represent as strong a current as most persons will submit to. I find that in using Erb's electrodes, if a current of twenty or more milliampères be used, the patient experiences great discomfort, and there is danger, if the current be continued six or eight minutes, of producing eschars which will interfere with the next application. Mr. Barrett originally made his instrument to register fifty milliampères, but I have reduced it to twenty in the instrument I have, because I seldom find it necessary to go above that point with the electrodes of Erb. Giving electricity without any dosage at all is certainly very reprehensible.

Dr. AMIDON.—Am I wrong in the impression that the graduation on the tangent is the same at the extremities as at the middle?

Dr. JACOBY.—The equality of the divisions is only an apparent one, for we have here only a small arc.

Dr. AMIDON.—I cannot see how the astatic needle can record the strength of the current accurately without there be a difference in the length of the degrees marked on this arc. The farther the needle deviates from the central figure, the greater the amount of electricity required to make it move an equal distance. I should think, therefore, that the degrees should be made progressively smaller.

Dr. DANA said that the doubt expressed by Dr. Amidon, with regard to the accuracy of the measurement by these instruments, did not apply practically. He had examined Mr. Barrett's galvanometer, and the same objection had been raised by different gentlemen, but a comparison of his

instrument, with those of the central offices of telegraph companies, where it was very necessary to avoid error, showed that the measurements were correct.

The PRESIDENT thought it would be desirable to have some conclusion reached with regard to the accuracy of electrical measurement by instruments of this kind.

Dr. W. R. BIRDSALL had had some experience with galvanometers, and had found that fifty milliampères were not of as great advantage on the ordinary working battery as twenty-five or thirty. With Erb's electrodes twenty milliampères indicated a very strong current; that ordinarily used was from five to fifteen. Mr. Barrett had explained to him the graduation of his instrument, which was done upon the correct plan of graduating according to the tangent system.

A series of brain sections preserved in glycerine, by Dr. H. D. Schmidt, of New Orleans, was presented by Dr. Starr

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Third day, evening session.

The Association was called to order by the President, Dr. B. G. WILDER.

Present—Drs. Wilder, Weber, Seguin, Spitzka, Rockwell, Amidon, Jacoby, G. M. Hammond, McNutt, Starr, G. B. Massey, Dana, Gray, and Bauduy.

The first communication was entitled "Demonstration of a Brain Monstrosity," by Dr. E. C. SPITZKA.

Dr. SPITZKA submitted for inspection the cerebellum and peduncular system of a child which had been affected with a number of peripheral deformities, such as macrodactylism and defective joint and muscle development. The case had been described by Dr. A. Jacobi as one of "congenital lipomatosis." Dr. Boldt, who was the attending physician, and to whom the speaker was indebted for the brain, had informed him that in several details, such as the alleged absence of the patella, the first reports published were imperfect. The cerebral hemispheres were unsymmetrical, and the gyri atypical, so that on one side the sulcus of Rolando could not be identified in any thing like its normal

relations. But the most interesting and novel feature was the heterotopia of the cerebellum, shown in the specimen exhibited. This ganglion was in the first place highly asymmetrical; the left cerebellar hemisphere not being one half the size of its fellow, the line of the vermis superior running near the junction of the outer and middle thirds of the transverse diameter. On the right side (basilar aspect) the white substance appeared at the surface like a lobulated tumor, and from it, as a centre, the abnormally arranged cerebellar folia radiated in every direction, so that it was simply impossible to identify the normal lobules. The influence of skull pressure as a modifying factor in the development of the folia was, however, prettily shown.

Dr. SPITZKA also made a communication entitled "Gudden's Atrophy Method."

Dr. Spitzka exhibited two sets of sections obtained from the peduncular axis of a cat, which had been killed three months after destruction of the left cerebral hemisphere and left thalamus had been accomplished. One set had been stained in ammonia-carmine, the other in acid-fuchsine. Aside from the well-known atrophy of the pyramid tract and cortex lemniscus, described by v. Monakow and Mayser, and the bilateral atrophy of the nucleus of the third pair (the nerve having been destroyed on the side of the operation), discovered by v. Gudden, the specimens demonstrated that the posterior commissure is not a commissure, but, as Meynert claims, a decussation of thalamus fasciculi, whose caudal course is immediately subjacent to the posterior longitudinal fasciculus. It also showed that the nuclei of the tegmentum were entirely unaffected, an evidence that the tract of which they are a station is probably a centripetal one. The most marked feature was the enormous atrophy of the nucleus of the column of Burdach, on the side opposite the destroyed thalamus. The posterior longitudinal fasciculus was reduced to from one half to one third or a quarter of the normal in the level of the anterior pair of the corpora quadrigemina, the atrophy being most marked in front and decreasing backward, where complete symmetry appeared to be established.

This atrophy the reporter thought was in connection with the atrophy of the corresponding half of the anterior pair.

Remarks on Dr. Spitzka's Communication.

The PRESIDENT asked Dr. Spitzka what was his impression of the recently promulgated theory, originating in Washington, that the porpoise, although ordinarily credited with having no hind limbs, nevertheless has them and the tail represented in a fused condition. He should say from a study of the nervous system of animals which have hind limbs that it harmonizes exactly with the view that there was absence of those limbs in the porpoise.

Dr. SPITZKA thought that the unity of the different sacral and lumbar nerves in one cord in the canal pointed to simplicity of the part supplied by that cord, and indicated that the porpoise had a true tail.

The PRESIDENT remarked that it showed the necessity for taking into account the muscles and bones in determining questions of homology.

Dr. B. G. WILDER then exhibited preparations of the brains of a dog, monkey (*Cercopithecus*), chimpanzee, porpoise, and man, and of an alinjected human hydrencephal,[1] stating the following points: (*a*) that, contrary to what is expressed or implied in most anatomical works, in the human brain (as in those of all other mammals examined with reference thereto), the rima (the part of the "great transverse fissure" along which the proper nervous parietes of the prosocœle are abrogated and the endyma pushed entad before the intruding prosoplex) stops 1–3 cm. short of the tip of the medicornu (on this point see the *N. Y. Med. Jour.*, April 5, 1884, p. 376, fig. 48); (*b*) in the human hydrencephal, notwithstanding the pressure which had more than doubled the normal diameters of the porta (orifice of communication between the aula and either "lateral ventricle," commonly called "foramen of Monro"), the dorsal circumscription, by the endyma reflected upon the intruded prosoplex from the opposite surfaces of the thalamus and fornicolumn, was

[1] After using this mononymic equivalent of *hydrocephalous brain*, I encountered the analogous word *hydrencephalocele*.

complete and distinct, as in the preparation represented in the *N. Y. Med. Jour.*, March 21, 1885, p. 328, fig. 7; (*c*) that the diacœle ("third ventricle"), instead of being roofed in directly by the overlying velum or fornix, much less by the callosum, has a true roof of its own, namely, the endyma, which may be distinctly traced in the hydrencephal from the mesal aspect of the thalamus over the habena toward the opposite side (see *N. Y. Med. Jour.*, April 26, 1884, p. 460); (*d*) as shown by Dr. Spitzka before the N. Y. Neurological Society in 1879 and 1880 (*N. Y. Med. Record*, June 25, 1879, and Jan. 17, 1880), other mammals besides man have a more or less elevated or gyrated region concealed by the opercula or lips of the Sylvian fissure. In the dog or monkey there is but a single elevation; in the champanzee two; in man four or five; in the porpoise exhibited the region evidently corresponding to the insula covers a greater area than in man, and the gyri are more numerous (13–15), but their elevation was so slight that Dr. Wilder thought they really represented a less extent of cinerea than in man. He hoped to have an opportunity of preparing the brain of a porpoise by arterial alinjection followed by the injection of starch after Pansch's method, so as to determine accurately the form, extent, and constitution of this important region. In this communication he had availed himself of preparations and drawings made at his suggestion by Mr. F. M. Chappell as a part of his thesis for graduation at Cornell University this spring.

In conclusion Dr. Wilder stated that unexpected official duties at Ithaca had prevented him from packing up for transportation the easily injured preparation by which he had hoped to illustrate (*a*) the form and extent of the adult aula (mesal portion of the prosocœle, or cephalad portion of the "third ventricle"), and (*b*) the fimbrial revert (the reverted margin of the fimbria or "*corpus fimbriatum*") and its relation to the prosoplex (*plexus choroideus ventriculi lateralis*).

Remarks on Dr. Wilder's Communication.

Dr. E. C. SPITZKA.—I regret that I did not bring my specimen of the porpoise brain with me. The insula is not

as mountainous as in the human brain; nor would I say now that the gyri are deeper, but they are more numerous. I think the aggregated surface of the porpoise insula would be fully as great, if not greater than the human. I may say that there is almost identity of the gyri in this specimen and in the one I possess; they are only a little more flattened. As the gyri run fan-shaped from before backward they become longer and longer. Not counting one subdivision in my specimen, it contains fourteen gyri.

Dr. WILDER.—Am I to understand Dr. Spitzka to say that the insula is elevated in his specimen?

Dr. SPITZKA.—It is not as elevated as in the human brain, but more so than in the porpoise brain presented by Dr. Wilder. I have the insula of an ourang-outang which contains one gyrus more than the insula of the chimpanzee presented. In the brain of the baboon which I have, there is one sulcus.

Dr. WILDER.—It seems to me the insula affords a very interesting field for investigation, and I wonder that more attention has not been given to it, especially in determining homologous parts.

Dr. E. C. SEGUIN, of New York, then read a paper entitled "A Contribution to the Pathology of the Cerebellum."

The case was one of tumor of the cerebellum occurring in A. M. B., thirty-seven years of age, single, without syphilitic history, who first came under Dr. Seguin's observation in consultation with Dr. English, of New Brunswick, N. J., in 1877. The autopsy was made April 24, 1885, by Dr. English and Dr. Elmer, of Trenton, N. J. Dr. Seguin had diagnosticated tumor of the cerebellum involving the superior vermis.

The symptoms were summarized as follows: Beginning with headache and one or more epileptoid or apoplectiform attacks; impaired vision, optic neuritis, and partial atrophy; typical cerebellar titubation; nystagmus; slight difficulty in articulation; no distinct paralysis; no ataxia, no anæsthesia; patellar reflex raised. Death, with cerebral and bulbar symptoms: stupor, convulsions, difficult articulation and deglutition, ptyalism, and polyuria.

Lesion.—Cyst of the cerebellum destroying the larger part of the vermis, penetrating the right lobe and pressing upon the floor of the fourth ventricle. Extensive syphilitic arteritis with varying forms of softening within the brain.

Remarks on Dr. Seguin's Communication.

Dr. SPITZKA.—Had the patient any subjective disturbance of the sense of space when in a condition of rest?

Dr. SEGUIN.—In the sense of vertigo?

Dr. SPITZKA.—Yes.

Dr. SEGUIN.—He had not. The attacks he described were those of impending loss of consciousness, not vertiginous. Dr. Seguin stated further that the cerebellum was not cut at all, as it was to be examined after hardening.

Dr. R. W. AMIDON.—I recently saw a case of cerebellar tumor, in consultation, in a child about six years of age. When I saw the child it was impossible to determine the subjective symptoms because of the age of the patient and stupor produced by bromide of potassium. The mother about a year previously had been relieved of sarcomatous glands of the neck by Dr. Bull. They did not recur. About a year after Dr. Bull removed the sarcomatous glands from the neck of the mother, this child, then about five years old, was taken acutely with symptoms resembling hydrocephalus. There was no fever, no convulsions. The case progressed four weeks before I saw it. The mother stated that about three weeks previously the child had begun to be very irritable, more or less sleepless, it bored the pillow a good deal with the head, was restless at night, all of the prodromal symptoms of tubercular meningitis. There was slight drooping of both eyelids, moderate external strabismus, probably double. Except when under the influence of bromide of potassium, the child was in perpetual motion. The hearing before the attack had been about normal; it was afterward almost entirely abolished. The optic nerve could not be examined, but vision was pretty good. When I saw the child it had rather a hydrocephalic head, and presented symptoms which led me to make a diagnosis of tubercular meningitis in spite of the

absence of fever. But after noticing absence of fever for a week or more I very reluctantly gave up my diagnosis, but did not venture another. There was much muscular weakness, the child was unable to hold up its head; the weakness progressed, finally there came on a condition of stupor, with failure of speech, coma, incontinence of urine, death. At the autopsy there was found a sarcomatous tumor involving the superior vermis, occupied by a cyst. The tumor extended down through the cerebellum, apparently involving to a certain extent the floor of the fourth ventricle. The case was specially interesting because of sarcoma developing in both mother and child.

Dr. DANA.—Were there any forced movements in Dr. Seguin's case?

Dr. SEGUIN.—No. When sitting quietly, the man appeared normal, except a peculiar expression of the countenance, which possibly was natural to him.

Dr. GRAY.—Had the patient the symptom of whirling in a circle?

Dr. SEGUIN.—No, not at all.

Dr. GRAY.—When he had these paroxysms was there any tightening of the skin of the scalp? I have seen in two cases of cerebellar trouble, tightening of the skin of the head as on a drum-head.

Dr. SEGUIN.—I did not hear of that in my case.

Dr. SPITZKA.—Was there any thing abnormal in the position maintained by the head?

Dr. SEGUIN.—There were no vibrations during rest, but there was a little inclination forward.

Dr. SPITZKA.—I am reminded of a remarkable case from the point of view of histology as well as of symptomatology—a case of pure lipoma of the inferior peduncle of the cerebellum. It was as if the part of the cerebellum left in Dr. Seguin's case were replaced by the lesion; the lesion, however, was more to the left than to the right side. The patient was a tailor afflicted with a form of insanity. He could work at his trade only by having a support for the head. Because of the fact that he had this psychosis and I saw him rarely I gave but little attention to his symptoms, and hence discovered the tumor only by accident.

The next communication was by Dr. BAUDUY, of St. Louis, "Notes on Hydrochlorate of Cocaine."

A paper by Dr. PHILIP ZENNER entitled "The Psychomotor Centres," a clinical contribution, and a paper by Dr. H. D. SCHMIDT, "A Case of Destructive Lesions of the Tegmentum, Thalami, and other Parts of the Brain," (see JOURNAL OF NERVOUS AND MENTAL DISEASE, Vol. XII., p. 294), were read by titles.

The PRESIDENT appointed as Committee on Electrical Dosage, Dr. Geo. W. Jacoby, Chairman; Dr. Amidon and Dr. Birdsall.

On motion, the Society adjourned to meet at about the same time next year, and at a place to be determined by the Council.

Reviews and Bibliographical Notices.

Lectures on the Diagnosis of Diseases of the Brain. By W. R. GOWERS., M.D. Pp. 246. London and Philadelphia, 1885.

Every one who has ever read the author's previous work on the spinal cord, can easily believe that the present work was written in response to a request for a similar work on the brain. The author has succeeded in giving us a work equally concise and clear, and has done much toward making the most difficult subject in medicine comprehensible to the student. Like the previous work, it is merely a manual of diagnosis, and his chapters on anatomy and pathology are properly subservient to that end. The book is divided into eighteen chapters, retaining the form of lectures, as originally delivered at University College Hospital.

As an essential preliminary to diagnosis, the first three chapters are devoted to a brief description of the anatomy and functions of the brain and cranial nerves. The work of condensing and arranging the many observations upon the course of the brain fibres has been well done, the statements as to our present knowledge are clear, and the many doubtful hypotheses are so stated as not to confuse the learner, but yet to set before him the most approved theories upon the questions at issue. The author, partly from certain observations of his own, takes occasion to oppose the old theory that the palate and the back of the tongue derive their nerves of taste from the glosso-pharyngeal, and maintains that these parts, like the front of the tongue, get their nerve supply from the fifth pair, perhaps from branches from the otic ganglion, through the small petrosal and the tympanic plexus which are distributed with the fibres of the glosso-pharyngeal. The anatomical portion of the work is illustrated by a dozen wood-cuts, chiefly diagrammatic, which are easily comprehended and do not confuse the reader by a multiplicity of details. We must except the first diagram from this praise, for we have seldom seen any thing more misleading than its representations of the convolutions. The author assumes a knowledge of the subject, and refers the reader to the diagram in question. We do not demand minute detail in a manual like this, and we have long since become hardened to variations from

the ordinarily accepted nomenclature, such as occur in both diagrams of the cortex, but we must protest against the false relations of the supra-marginal and angular gyri as here given, and at the implication that the temporal lobe has externally but two convolutions, of which what we know as the second is styled the inferior, while the third is entirely neglected.

The next nine lectures are devoted to symptomatology, taking up in succession hemiplegia, convulsions, disorders of special senses, cranial-nerve symptoms, mental symptoms, disturbances of speech, general disturbances, and ophthalmoscopic changes. The account of the various symptoms is, as a rule, trustworthy, succinct, and fully up to our present knowledge, and every chapter is full of useful suggestions for examination or diagnosis which are not without value even to the specialist. With a hemiplegia on the same side as the lesion, however, we prefer to accept Wernicke's theory, that the lesion, if it be a tumor, may exert pressure on the opposite crus cerebri, or even Morgagni's old theory of a failure of decussation of the pyramids, than to adopt the author's hypothesis of an undiscoverable lesion in the opposite hemisphere. There seems to be a useful distinction, too, between paresis and paralysis, which the author is not inclined to admit. As was to be expected, his treatment of ocular symptoms is well done. Rejecting von Graefe's old theory of pressure, and, to some degree, Schwalbe's idea of distension of the optic sheath, he attributes optic neuritis to a variety of causes, chiefly to an irritative process conducted along the nerve. He also calls attention to the distinction between the fields of vision in beginning neuritis and tobacco amblyopia, which we had previously found of value in a case under our own observation. His chapter on oculo-motor paralysis, as well as that on aphasia, which follows Hughlings Jackson quite closely, has the unusual merit of leaving the subject less obscure than it was before reading it. He casts great doubt on the possibility of an affection of the soft palate in paralysis of the facial nerve, affirming that he has sought for it in vain for fifteen years. Those who still cling to the once popular theory of cerebral hyperæmia, and rejoice in making the diagnosis of "congestion of the base of the brain," will find little to please them in his statement that such a diagnosis, as commonly made, has not the "slightest justification," and they will find cold comfort in his remarks upon "those physicians who find it profitable to pander to the morbid tendencies" which some neurotic patients have of dwelling upon certain sensations and imagining that they are definite affections.

The two lectures which follow take up the question of localization of disease, and, of course, repeat much of what has preceded; viewing the symptoms, however, from a different standpoint. The same praise is due here as in the other chapters; the various facts and theories are stated briefly, clearly, and accurately, and are in accord with the latest work on the subject.

The remaining lectures are devoted to pathology and pathological diagnosis. In his chapter on the pathological changes, he dif-

fers from the recent writers on cerebral disease in laying greater stress upon *venous*—not sinus—thrombosis as a cause of sudden disease of the brain in children, and supports his theory by cases from his own observation. In his diagnosis of the lesions he divides them into sudden, coming on in a few minutes or a few hours; acute, coming on in a few days or a few weeks; and chronic, coming on in a month or more. Under the first head, he puts the vascular changes; under the second, inflammations; and under the third, chronic inflammations, new growths, and degenerative diseases like bulbar paralysis, multiple sclerosis, and general paralysis of the insane. His statements, as a rule, are clear and judicious, but one or two of them are misleading. "Coarse jerking" is hardly an appropriate term for the typical rhythmical tremor of multiple sclerosis; nor is it true that "headache is absent in the purely degenerative diseases." In general paralysis, at least in the type of the disease most frequently seen at the present day, a moderate headache is a very frequent symptom, and the first symptom in some cases, as in a man at present under our observation, may be a most intense and persistent headache lasting for weeks. In some cases of hysterical hemiplegia, too, the physician might be misled by the statement that "the skin-reflexes are not lessened on the affected side; the knee-jerks are equal." Charcot, Weir Mitchell, and others, have noted a variation in the knee-jerk on the two sides in many cases of hysterical hemiplegia, and we have ourselves noted its variation in two cases, combind with hemianæsthesia, in one of which the plantar, gluteal, and scapular reflexes, too, were absent on the affected side.

In spite of the few errors mentioned, which we hope to see corrected in a new edition, the book remains a clear and admirable manual in diagnosis, a fitting companion to the author's previous work on the cord, and by far the best work on diseases of the brain that we know in English.

P. C. KNAPP.

Zehn Vorlesungen über den Bau der Nervösen Centralorgane. Von Dr. LUDWIG EDINGER. Mit 120 Abbildungen, S. 138. Leipzig: F. C. W. Vogel, 1885. 6 marks. Ten Lectures on the Structure of the Central Nervous System.

Dr. Edinger is well known to those who are familiar with the German neurological school, as an investigator who has made valuable contributions to the subject of the microscopic anatomy of the brain. Under the direction of Flechsig he has given much time to the study of the development of the brain, and we owe to him the knowledge of the order of formation of the fibres in the corpus striatum.

Being thoroughly familiar with the subject of brain anatomy in its latest developments along the lines of embryology, comparative anatomy, and pathology, he was well qualified to present a summary of recent investigations to the profession in Frankfort-on-the-Main. These lectures were delivered last winter before a

company of physicians and surgeons who desired to obtain some knowledge of the rapid advances made of late in the anatomy of the central nervous system.

To a German practitioner, to whom the literature of this subject is easily accessible but is overwhelming in its amount, these lectures afford a concise summary of the subject, and being written in a clear, intelligible style, with a marked avoidance of technical points and disputed questions, they form an attractive little volume for perusal. And yet they are by no means superficial, there being hardly a single fact of any importance which does not obtain its proper amount of attention.

The first lecture is devoted to a short account of the history of investigation in the domain of brain anatomy, and a clear statement of the numerous methods of research which are open to the histologist. The debt which we owe to Meynert for many of the recent discoveries, and for an intelligent classification of the systems of fibres in the brain, is fully acknowledged ; and the German names which are coupled with his afford ample evidence regarding the locality in which much of the best work has been done. But the French and English schools receive their due award of honors, although it is evident that in this department they can hardly compete with Teutonic rivals. The methods of investigation proposed by Stilling, Meynert, Flechsig, Gudden, and the comparative anatomists, are clearly stated. Then there follow lectures on the development of the brain, the convolutions, the association- and the projection-system of fibres, the basal ganglia, the brain axis, and the spinal cord. These are illustrated by numerous diagrams and drawings of sections, many of which are original and very satisfactory. A large number of these show sections through fœtal brains in various stages of development, which have been stained by Weigert's method, and show very clearly the course of certain bundles of fibres. Figs. 39, 42, and 47 show the course of white fibres through the corp. striata as first demonstrated by the author, and aid very much in the comprehension of that vortex of fibres which is included in the subthalamic region. The method of Flechsig is the only one which throws light upon such a complex structure, and these drawings will demonstrate to any one who is not familiar with the appearance of sections made from fœtal brains, how important that method is. The discussion of the numerous fibres and ganglia of the crura cerebri is satisfactory, as are also the descriptions of the cerebellum and of the cranial nerve nuclei on the floor of the fourth ventricle. The views of the author regarding the connection of the posterior columns of the cord with the medulla (see JOURNAL OF MENTAL AND NERVOUS DISEASE, Periscope of Anatomy, April, 1885), already reviewed in this journal, are clearly stated, and are supported by drawings of sections which demonstrate their accuracy. There are some points regarding the anatomy of the medulla which are open to criticism. It is highly improbable that the centripetal fibres passing from the cerebal cortex to the

cranial nerves pass down in the formatio reticularis of the pons and medulla. It is true that Meynert gave to a part of this the name "motor area," but he no longer defends the position stated by Edinger. It is much more probable that these fibres descend in company with the pyramidal tracts, turn dorsad in the raphé, and decussate as they pass dorsad to the cranial nerve nuclei. They thus pass between the formatio reticularis of the two sides, but nowhere lie in it. In fact none of the drawings of the author can be cited in support of diagram fig. 105, and it is contrary to the course which pathological observations indicate. The description of the acoustic nucleus is subject to corrections, and is less complete than that of the other nerves. The statements regarding the course of sensory impulses in the medulla and pons do not correspond to the facts as determined by a comparison of numerous pathological cases; in fact, the author nowhere defines clearly the limits of the sensory tract in the brain axis. The spinal cord is discussed in the eighth lecture. The author has not offered any new facts regarding it, nor is his discussion of this portion as complete as of other parts of the central nervous system. No attempt at the localization of functions in the cord is made, although there are at present numerous facts which warrant valuable statements. An interesting drawing of a cord in which atrophy of one anterior horn had accompanied defective development of one extremity in a child, is to be found on page 7. According to diagram 91, all the fibres of the anterior median column cross to the opposite anterior horn through the white commissure. If this were so, the weakness of the side of the body corresponding to the brain hemisphere injured, which occurs in hemiplegia, could not be explained.

These are the chief points which call for comment, and considering the complexity of the subject and the varying views upon it, they must be admitted to be minor faults. The work as a whole is extremely satisfactory. In fact there is none which covers this field in such a clear and concise manner, and to those who care to obtain a reliable summary of brain anatomy the book can be recommended without reserve. The method pursued in the recent German works on brain anatomy is so different from that with which readers of Gray and Quain are familiar, and is so superior, that it is to be hoped that the English and the American anatomists will profit by the advances of their Continental contemporaries in the preparation of new editions and works. The only presentation of the subject which is intelligible and practical is that which is given by Edinger, Wernicke and Meynert, viz.: to trace systems of fibres from one part of the brain to another part, coupling the consideration of the physiology of a tract with its anatomy, and not omitting the light thrown on the subject by pathology. Descriptions of sections through the brain are of secondary importance, and only become intelligible when combined with the better method. It is also greatly to be wished that English and American readers could be supplied with works of this character in the readable and cheap form in which such German

works appear. Published in pamphlet form, with large pages which admit good-sized diagrams, and in clear type, the book presents an attractive appearance. M. A. STARR.

The Nature of Mind and Human Automatism. By MORTON PRINCE, M.D. J. B. Lippincott Company, Philadelphia, 1885.

We shudder to think of the task Dr. Prince has set himself in the little book before us; and we stand in awe of his courage when we read that this task was first attempted in a graduation thesis, "some eight or nine years ago." Graduation theses, the world over, are not remarkably long-lived, and but few of them are considered worthy of a revival after a lapse of years. Dr. Prince has done well, however, in rescuing his essay from utter oblivion. His subject is no less a one than the relations of mind and matter—that mystery of mysteries which has baffled the ingenuity of the ablest minds of all ages. It would be no mean praise to say that the author has not overreached his own ambition; but we must say more than that, for he has made an interesting contribution to the study of this question, and if he has not explained away the mystery altogether, he has, at least, defined most accurately the exact nature of the problem to be solved.

According to Dr Prince, philosophers and psychologists have themselves to blame for the obscurity in which this question is still involved. They have deepened the mystery "by a dust of their own raising." The chief difficulty lies not, so the author would have us believe, in the problem itself, but in the cloudy notions some of our modern gods—Spencer, Tyndall, Huxley, Bain, and John Fiske—had of *what* was to be solved. Dr. Prince berates them all for their misconception of the subject under discussion, but the author will himself acknowledge that, in this instance, to state the problem clearly is to give half the proof.

To this half Dr. Prince has made a most valuable contribution. What *is* and what is *not* to be discussed, was perhaps never brought home to our minds as vividly as after reading this essay. But how about the other half of the mystery?

The theorem which Dr. Prince starts out to prove is: "Instead of there being one substance with *two properties* or 'aspects,' *there is one substance*—mind; and the other *apparent* property, motion, is only the way in which this real substance, mind, is apprehended by a *second organism*" (p. 29). It is all mind, therefore, and nothing more. If so, the author would be justified in saying, as he does further on (p. 37), that "a great deal of thought has been devoted to trying to understand how molecular changes are transformed into consciousness, when in reality there is no transformation at all." And yet, though we call in the agency of a second organism, we have still to cope with two sets of facts. Call them mind and motion, different properties of mind or different properties of matter,—call them what you will, the exact relation of these two different facts remains the chief mystery. But let us see how Dr. Prince solves the problem.

He concedes very justly that we have *mental* and *physical* phenomena to deal with. "The one we know as thought, sensation, and emotion, the other utterly unknown objectively, but represented by symbols in consciousness." The question then remains, How is consciousness formed? Dr. Prince states four possible hypotheses, but declares in favor of the following: "Consciousness may be a change in the mutual relations of the *actual* or *real* molecules of the protoplasm of the brain-cells; that is, *these unknown physical disturbances themselves,—the protoplasmic disturbances as they really are; the actuality of so-called neural undulations*" (p. 50). And again, it is stated on page 55: "*The former* (the mental state) *is the actuality, the latter* (physical changes) *a mode by which it is presented to the consciousness of a second person,*[1] *i. e., to the non-possessor of it.*"

But now comes the rub. How is it that one state of consciousness is perceived as another state of consciousness (in a second person)? On this point the author argues very acutely, and fortifies his position by the use of concrete examples. These are most happily chosen, and it would be doing the writer an injustice to quote them here apart from their context. If the reader does not feel firmly convinced of the force of Dr. Prince's argument, the fault may be in his "neural vibrations," and not in the author. It does not appear to us, however, to simplify matters much to state that the parallelism (as in the case of a sensation of pain and the accompanying physical phenomena) is "*between your consciousness and my* (the second person's) *consciousness of your consciousness.*" With a short chapter on the Correlation of Forces the first part of the book closes.

The inquiry into Human Automatism will be found both instructive and interesting. Dr. Prince thinks man an automaton, but not an automatic machine. And he shows that the reflex actions of man are largely subject to the influence of consciousness. Like all writers on automatism, our author sees the necessity of discussing the bearings of his theory upon free-will. In the section on Self-Determination he argues that freedom of the will is compatible with his theory of the reflex character of our ideas. There is a final chapter on Materialism, in which the author is at some trouble to defend and define the moral aspects of that doctrine.

The entire book, and more particularly the first half, deserves careful study. If all of the author's views cannot be definitely accepted, they have, at all events, the preëminent merit of being original, and of inducing the reader to re-analyze his own views with the aid of the additional facts and arguments which Dr. Prince has furnished. The author's language is always clear, and often unusually vigorous. We hope that Dr. Prince will ultimately turn his attention to the study of mind in disease, to those questions in particular which are on the borderland between

[1] All italics, as in original.

psychiatry and psychology. Few medical authors would seem to be better qualified for this sort of inquiry.

B. S.

Report of the Committee to Investigate the Affairs and Management of the State Lunatic Asylum at Utica.

Made to the Assembly, April 27, 1884.

In a review of testimony taken by a committee of the State Senate appointed to investigate alleged abuses in insane asylums, published in the JOURNAL for April, 1884, reference was made to an investigation, then in progress, of the State Lunatic Asylum at Utica, "and particularly to the circumstances concerning the death of E. D. Hughes, a patient." This investigation was made by a committee of the Assembly in April last, and its report, with the testimony, making a volume of 1,400 pages, is now published.

The case of Hughes is one common in insane asylums everywhere, but so flagrant an abuse, followed by so shameful a miscarriage of justice, could happen in no other civilized country. And the disgrace which attaches to the lunacy system of the State, and to the State itself, is made worse by the fact that the killing of Hughes is only one of a series of similar outrages which have marked the recent history of the Utica Asylum. Its similarity to the case of Tarbell, who was fatally injured by his attendants in 1859, has already been noticed.[1] Another case, brought to light by this committee, and described in its report, is that of a patient named Heath, "who died within a few days after his ribs were broken by Reese," an attendant. In another, which is referred to in the report of the asylum for 1869, the patient died, on the ninth day after admission, as the result of nine fractures of the ribs and puncture of the pleural cavity. These injuries, it should be said, were claimed by Dr. Gray to have been inflicted before admission to the asylum, as were those of Tarbell, but the presumption is clearly against such an origin, and the fact that no inquest was permitted is significant.

The history of the Hughes case is quite sufficient, however, to prove the urgent necessity of reform in the Utica Asylum. It was found by a coroner's jury that this patient came to his death from injuries inflicted by his attendants, one of whom was afterward tried and convicted of manslaughter in the second degree, against the testimony of Dr. Gray and his assistants. The Assembly committee, in the present report, declare that they have unanimously reached a conclusion to the same effect. But the guilty attendant was permitted by the judge to escape with a fine of $1,000, which was promptly paid for him, and the officers and employés of the asylum have a new assurance of impunity for any neglect or abuse of which they may be guilty in the future.

Upon the question of the care of patients by attendants generally at this asylum, the committee are "convinced that very many

[1] *Vide* vol. ix., page 286.

cases have occurred in the past, and, according to present arrangements, are not unlikely to occur in the future, where, during the absence of the physicians, patients have been treated with great roughness and, at times, with cruelty and brutality. The evidence upon which the committee unanimously base this opinion is found in the concurrent testimony of the injury-books, of the attendants, ex-attendants, patients, and former patients, and the confirmatory proof furnished by the facts in the case of Mr. Hughes." Six cases of serious abuse are described in the report, in each of which "great and unnecessary violence" was used. "It is, therefore, the unanimous belief of the committee that attendants do, from time to time, treat the patients with reckless and wanton roughness, and at times with a cruelty that is simply outrageous, considering the helpless mental condition of the patients." They believe, also, that such abuses are due to "insufficient supervision," and to the "low pay, long hours, and insufficient training of attendants." And, in conclusion: "This is the weak point in asylum management, so far as the observation of this committee has extended, and it is right here that remedial measures should be most promptly applied."

No one, after reading the testimony, could doubt the formal justice of this conclusion. But it need hardly be said that the prompt application of "remedial measures" is not yet assured. The chairman of this committee and the majority of its members, together with Dr. Gray and the President of his Board, belong to a party which has had control of the State Legislature for twenty-five years. During that period the annual disbursements of the asylum have risen from $120,000 to $220,000, over which there is no supervision or responsible control, as the committee declare. It is plain that until the power of party and the irresponsible use of public money can be taken from Dr. Gray, the reform of his administration will be difficult.

The report next considers the subject of female physicians in asylums for the insane. Dr. Vanderpoel, formerly a manager, and Dr. Gray are quoted against this innovation, and Dr. Stephen Smith, Lunacy Commissioner, in its favor. The various arguments, pro and con, are examined, and in conclusion the committee "unanimously recommend that one woman physician be appointed by the Board of Managers of the asylums, and that the lunacy laws be so amended as to provide for a similar appointment in all the State asylums."

In regard to the business management of the asylum, "the committee are of the opinion that the system at present pursued is loose and unbusiness-like, and that a radical change is needed." They find that "in this department, as in the medical, Dr. Gray is the practical and sole head." Certain grocery staples are purchased at a cost of five per cent. above wholesale prices in New York, the charges for freight being included. This the committee thought too large a margin of profit for such articles, and "were satisfied that the asylum paid upward of twenty per cent. more

than it should have done for miscellaneous food and drug supplies." It also appeared that the bills of the asylum were never seen by any of the managers until after they had been paid, and that, "in short, there was no supervision whatever over all the great expenditures for supplies by the Board, who left this, as they did every thing else connected with the institution, to Dr. Gray."

"As an illustration of the general ignorance on the part of the Board of the way money was spent, the committee were much struck with the fact that, some time last autumn, Dr. Gray and the steward. Mr. Dwyer, went to Syracuse and purchased for the asylum a thoroughbred Holstein bull and two cows, at a cost of $1,350. The committee are clearly of opinion that such a purchase for the institution was entirely unwarranted and extravagant, and it appears that the purchase was made without the authority of the Board, and solely by Dr. Gray. The steward was constrained to admit that, in his judgment, the purchase of such stock was not the legitimate work of the institution, while Mr. Campbell, President of the Board of Managers, had never heard of it until asked about it on the stand, when he expressed his disapproval of it altogether."

Upon the publication of this report, some additional facts were brought to light by the newspapers, which still further illustrate Dr. Gray's system of expenditures. The cattle above referred to were purchased of Mr. Geddes, one of the Assembly committee of 1883 for the investigation of abuses in asylums, whose report was "mislaid" for ten months after it was ordered printed, as noticed in the JOURNAL for April, 1884 (page 287). With great difficulty, and after much delay, this report was found by Mr. Geddes, but it has not even yet been printed.

There is a great want of harmony between the facts in regard to the financial management of the asylum, and the statements of its superintendent and managers. Dr. Gray testifies to the committee that he "knew nothing about the finances of the institution," and that they were "not under his direction or care." And the managers declare, in their report for 1880, that "all purchases of supplies, of every kind, are made by the steward," and that "every item of expenditure for asylum purposes passes under their personal examination." But in addition to what has already been given in direct contradiction of these statements, it appears that not only are all purchases made by Dr. Gray, or under his direction, but that the weekly charge for maintenance to both public and private patients is fixed by him, and the reports of the steward and treasurer are "cooked" by his hand.

Again condemning Dr. Gray's management as lax and extravagant, the committee strongly recommended a new system, under which the Comptroller of the State would be the financial head of all State charitable institutions. This is the system suggested by Mr. Apgar in his report to the Comptroller, made in 1879. The report, as the committee observe, "sharply criticised the

asylum," and Dr. Gray, in his testimony before the committee, charged Mr. Apgar with "inaccuracies and misleading statements" in matters of fact, and "unfairness in his deductions." To these charges Mr. Apgar replied in person, under oath, and "after a careful comparison of the two statements, the committee were "satisfied of the substantial accuracy of his report, so far as it relates to the asylum," and fully concur in his suggestions in favor of State supervision. They recommend, also, that this "whole subject be referred to a Board, composed of the Comptroller, the Attorney-General, and the President of the State Board of Charities, to examine and report to the next Legislature, by one or more bills, a plan for the transfer of the financial management of all the State charitable institutions to the supervision and direction of the Comptroller of the State." This recommendation was promptly acted upon by the Legislature, and the committee have shown much interest in entering upon their important work.

As the great extravagance of Dr. Gray's administration, and his attempts to conceal the same by false and deceptive accounts were first pointed out in the JOURNAL,[1] it will be proper to notice here some extraordinary misstatements in his sworn criticism of Mr. Apgar's report. In one of the tables of this report the cost of maintenance, calculated on the total expenditures of the Utica Asylum for 1877, was shown to be almost exactly double that of the asylum at Northampton, Mass., for an equal numer of patients. At Northampton this cost was $3.50 per week for each patient, and at Utica, $7 per week. As Dr. Gray's expenditures for the the year were $220,000, the excess of $110,000 is really worthy of consideration. His reply begins by declaring the comparison of asylums unfair, because that of Northampton "is largely for the chronic insane," while the Utica Asylum is "an hospital for the acute insane." He says, further, that "since 1863, the Utica Asylum has become, more conspicuously than before, an hospital for acute cases," while that of Northampton "has long been a receptacle for chronic insane." Now, it is well known that for several years the acute insane of the eastern part of this State have been committed to the Poughkeepsie and Middletown asylums, and those of the western part to the Buffalo Asylum; leaving those of the central counties only to be sent to Utica. The result has been, of course, to lessen very much the number of acute cases received at the latter institution, and Dr. Gray states, in his report for 1882, that the number of chronic cases has risen from one third to one half of those admitted in two years. The fact is, then, that his asylum has become less than before a hospital for acute cases, and is fairly compared with the Northampton Asylum.

But Dr. Gray proceeds in his testimony to make the comparison which he declares an unfair one, and he does it in a most unfair and untruthful way. He says that the charge for public patients at Utica in 1878 was $4 per week, while that at North-

[1] *Vide* vol. ii., page 776.

ampton *for the same items* was $3.50. The truth is, however, that this charge of $3.50 per week to the State covered the cost of board, clothing, salaries, repairs, and all other items; while to the charge of $4 per week at Utica must be added a charge of about 50 cts. per week for clothing and damages, and the sums of $15,000 for salaries, and $20,000 for repairs. We find, therefore, a relative excess in Dr. Gray's expenditures of $66,000 for the year, which is increased by his greater charges for private patients.

This is bad enough, indeed, but another misrepresentation is still worse. Mr. Apgar reported that, during the thirteen years—1865–1878—the Northampton Asylum had paid, from its funds received for the board of patients, the sum of $156,701.31 for repairs and improvements; while the Utica Asylum, with much larger receipts from patients, had drawn from the State treasury an additional sum of $384,886.71 for the same purposes. Dr. Gray atttempts to explain this excess by saying that this large sum was expended for "the renewal and enlargement of an old building, which had thus been made to accommodate one hundred and seventy-five more patients, and to abandon, at the same time, forty rooms in the basement." But the fact is clearly stated in his reports, that the capacity of his asylum was for 600 patients at the beginning of the period referred to, and was the same at its close, in 1878. It appears, also, that the "forty rooms in the basement" were abandoned more than thirty years ago.

In the concluding pages of this able and impartial report the visitation and supervision of asylums is considered. "It appears from the testimony taken in this investigation," say the committee, "that there is but little inspection or visitation of the Utica Asylum, either by the Board of Managers or by the State Board of Charities. In fact, it appears to be the settled policy of this institution to have the inspection and supervision of this asylum left to the medical staff." It also seems that not only do these managers permit their superintendent to supervise himself without the slightest check, but that they are ready to do battle with all who attempt any supervision of him. Soon after its organization, in 1868, the State Board of Charities requested Dr. Gray to prepare a statement of his receipts and expenditures under a few general heads, and also of the amount of his ordinary and extraordinary expenditures, and his weekly cost per patient. The gross falsification of these returns has been repeatedly exposed in the JOURNAL,[1] and it has lately been testified under oath before his managers that, without exception, every one of these annual reports to the State Board for fifteen years is so falsified as practically to conceal about $50,000 yearly in his expenditures. Nor does it appear that this deception has been carefully and cleverly done. On the contrary, it is so transparent, that Dr. Gray has apparently been himself dissatisfied with it, and has adopted a new method nearly

[1] *Vide* vol. ii., page 81; vol. iii., page 359; and vol. vii., page 357.

every year. Can we suppose that this ill-disguised "cooking" of accounts has escaped the notice of the State Board for fifteen years? Have they not more than suspected that their annual report was being used for deceiving, instead of informing, the public and the Legislature? Here is, perhaps, the origin of what the committee term "a long-standing controversy between the Utica Board of Managers and the State Board of Charities, as to the supervisory powers of the latter." In 1880, the State Board called upon the several State charitable institutions for an itemized account of their expenditures. "All responded," say the committee, "and have continued to furnish such information annually, except the State Lunatic Asylum, and the Buffalo State Asylum for the Insane. These institutions denied the right of the State Board to exact such information, and have never complied with such request." This refusal was first defended on technical grounds by the managers, but they end by denying the authority of the State Board, and declare themselves "amenable only to the authority which created them." One may admire the audacity with which the claims of a ring of local politicians to an important State institution are asserted. But these managers forget that these are not the days of Tweed and the Canal Ring? At any rate, the lines are distinctly drawn between the Legislature, the Governor, Comptroller, Attorney-General, and State Board of Charities on the one hand, and Dr. Gray and his managers on the other. Dr. Gray is, perhaps, the most experienced politician and lobbyist known in the State capital, and he is, of course, backed by all managers of asylums to whom these institutions are only a means of access to the State treasury. But the abuses, which are the necessary outcome of this theory of asylum management, have been so fully exposed that the public mind is bent upon reform, and it cannot be much longer delayed.

J. G. KIERNAN.

Editorial Department.

"CLINICAL CASES."

THE editors are desirous of constituting a department of "Clinical Cases" a permanent feature of this JOURNAL. It is not intended that this department shall be a collection of rarities. Phenomenal cases will always be welcome, and will be certain to excite the interest of our readers; but we are anxious to have any case which *has some special feature to recommend it*, carefully reported and discussed. In the domain of mental and nervous diseases, more than in any other branch of medicine, are we still sorely in need of large numbers of carefully recorded cases and of thorough-going *post-mortem* examinations. There are many questions regarding organic brain and spinal-cord disease which cannot be satisfactorily settled until more of such work shall have been done. Will our collaborators and correspondents kindly aid us in establishing this department of the JOURNAL?

PROF. WILDER'S PAPER.

THE principles of encephalic nomenclature, which Prof. Wilder has warmly advocated for several years, are stated in full in the article from his pen in this number of the JOURNAL. Prof. Wilder's views have attracted considerable attention in this country and in England, but they have received little notice hitherto from German or French medical authors. We hope that his projected system of nomenclature will now be made known to a larger number of Continental writers. We shall be curious to hear their comment, for many German and French anatomists have done good work on the brain, without being inconvenienced by the confusion of existing terms.

Periscope.

a.—ANATOMY OF THE NERVOUS SYSTEM.

THE OPTIC THALAMUS.—Vitt. Marchi has made an elaborate report of his researches upon the histology of the optic thalamus conducted in Golgi's laboratory. He finds that the majority of the cells of the thalamus measure from 40–60 μ, although a small number of small cells, 20–40 μ, are to be found throughout this ganglion. The form of the cells varies greatly, some being spindle-shaped, others pyramidal, others polygonal. All the cells possess numerous protoplasmic prolongations and one axis-cylinder process. The latter in its course occasionally is found to divide into several branches, which are lost in the fine network of nerve fibrils, and possibly coalesce with the neuroglia cell prolongations. As a rule, however, each axis-cylinder becomes continuous with a single nerve-fibre and preserves its individuality. The nerve fibres are united into bundles which run parallel to one another. The protoplasmic prolongations, on the other hand, by uniting, make up a dense network of fibrils which surrounds both cells and nerve fibres. Marchi thinks it probable that the nerve fibres and the cells with which they are connected are motor in function—and as their number exceeds that of the cells with branching axis-cylinders, he considers the thalamus a motor ganglion. The danger of drawing from anatomical data physiological conclusions has not been avoided by the investigator.

The neuroglia of the thalamus resembles closely that in other ganglia. Marchi finds that the ependyma covering it is formed of cylindrical epithelium, whose roots are branched and end in the walls of the blood-vessels.

He recommends that thalami of the smaller mammals be used to demonstrate the histology of the organ, as they can be well stained by osmic acid. He injects a 2 % sol. of bichromate of potash into the carotid before removing the brain, and thus secures a better hardening of the entire ganglia.—*Neurol. Centralbl.*, July 1, 1885.

THE SUPERIOR CEREBELLAR PEDUNCLE.—Bechterew finds in fœtal brains that in this peduncle two sets of fibres can be distinguished, which develop at different times. One of these lies in the dorsal part of the peduncle, and comes from the nucleus tegmenti of the same side. The other lies beneath the first, and comes from the embolus and nucleus globosus of the same side. There is therefore no connection between the dentate nucleus of the cerebellum and the superior peduncle. The peduncular fibres are derived wholly from the nuclei of the vermiform lobe. They pass forward, cross in the decussation beneath the corp. quadrigemina, and end in the red nuclei of the tegmentum.—*Centralblatt. für Nervenheilk.*, June 15, 1885.

THE LEMNISCUS.—Von Monakow has divided the lemniscus at the level of its exit from the upper border of the pons, and observed the secondary atrophy which was present six months after the operation. The parts divided were the lateral and lower portions of the lemniscus, and the right trigeminal nerve. The resulting atrophy affected the lower lemniscus, together with the mass of gray cells which lie beneath the lower corp. quadrigem. ; the upper part of the upper olivary nucleus ; the dorsal portion of the interolivary tract ; and the fasciculus which passes from the lemniscus into the lateral column of the cord lying ventral of the ascending trigeminal root (the aberrant lateral bundle of Monakow). The atrophy also affected the lateral lemniscus and its continuation downward in the lateral and ventral area of the interolivary tract, across the raphé and into the nuclei of the opposite columns of Goll and Burdach. These nuclei were both affected by the atrophic degeneration, the median part only of the nucleus cuneatus however being involved. The ascending root of the trigeminal nerve was also atrophied in its entire extent as low down as the spinal cord.

From this experiment von Monakow concludes that (1) in the lower lemniscus pass three separate bundles, which are connected, respectively, with the gray nucleus beneath the corp. quad. post.; with the upper part of the upper olivary nucleus ; with the lateral column of the spinal cord ; and (2) in the lateral lemniscus pass fibres connecting the parietal lobules of the cortex with the nuclei of the columns of Goll and Burdach of the opposite side. In a former paper von Monakow maintained that the lateral lemniscus passed wholly to the column of Goll. This position he now retracts, and admits that a re-examination of his specimens has demonstrated that a portion of it passes to the column of Burdach also. The entire nucleus of Burdach is not, however, connected with the lemniscus. Its outer half is not affected by atrophy when the lemniscus is divided. Hence von Monakow distinguishes two parts of the nucleus of Burdach, an outer and an inner. The latter is in connection with the lemniscus, and the former is in connection with the column of Burdach only.—*Neurologisches Centralblatt*, June 15, 1885.

THE ACOUSTIC NUCLEUS AND THE INTEROLIVARY TRACT.—Freud has examined the medulla of fœtuses of 5–6 months' age, under Meynert's direction. At this time the acoustic fibres are medullated. He finds that the acoustic roots lie in a row from without inward, and end wholly in gray nuclei of the side on which they enter. The outer fibres end in the anterior nucleus, the middle fibres and a portion of the inner fibres end in the inner nucleus, the remainder of the inner fibres turn about and pass to the outer nucleus. From these nuclei new fibres arise. There is a bundle from the anterior to the inner nucleus. There are arched bundles from the inner nucleus to the decussation in the nucleus tegmenti of the cerebellum. There are fibræ arcuatæ between the inner nuclei which pass through the facial nucleus, and between the outer nuclei which pass through the area lying ventral of the former. There are bundles issuing from the anterior nuclei, and these make up the corp. trapezoides and pass through the upper olivary nucleus. After crossing the median line they turn downward into the interolivary tract. At this time there are no fibres to be found above the corp. trapezoides which correspond to the interolivary fibres in their stage of development ; at the level of the decussation of the corp. trapezoides the interolivary tract begins ; no other continuation of this bundle can be found ; hence Freud concludes that the two tracts are continuous. But since the interolivary tract passes to the opposite posterior columns, this tract connects these columns with the anterior acoustic nucleus. The other constituents of the interolivary tract (lemniscal fibres) are not developed at this age. This conclusion agrees with the observation of Vejas, that after extirpation of the posterior column of one side an atrophy could be traced as high as the corp. trapezoides in the interolivary tract, but no higher (see Periscope, Jan., 1885).—*Neurologisches Centralblatt*, June 15, 1885.

THE TRACTS IN THE SPINAL CORD.—Homén of Helsingfors has experimented upon dogs to determine the direction, time, and exact character of degenerative changes in the tracts of the spinal cord. By using Weigert's methods of staining with fuchsin and hematoxylin it is possible to distinguish the changes occurring in the axis-cylinder from those due to degeneration of the myelin or of the connective tissue. Homén finds that in all cases the primary change after section of the cord consists in a granular degeneration of the axis-cylinder. The axis-cylinder appears as a granular light-yellow mass, while the myelin is intact and is surrounded by the normally stained blue erythrophile ring. Later the cylinder becomes swollen, the space between it and the colored ring becomes less ; the myelin is involved in the degeneration, and the two cannot be distinguished from one another. Lastly the appearance of Deiters' cells indicates the participation of the connective tissue and the terminal stage of the process.

Homén finds distinct evidence of the beginning degeneration in the axis-cylinders three to five days after the operation of cutting the cord. He distinguishes the true secondary degeneration from the traumatic degeneration which occurs near the point of section, by the presence in the latter of shining masses of exudation which do not absorb the staining material.

The various tracts do not degenerate simultaneously. The process begins in the posterior columns, and attacks their entire longitudinal extent from the first; later, the lateral column and anterior median column are affected, and last of all the direct cerebellar column. The column of Clarke was thought to be somewhat smaller, the number of fine fibres being decreased, and the number of cells being reduced, in one case in which the operation was unilateral. A comparison of these experimental results, with the observations upon a number of human cords in which degenerations had occurred, has convinced Homén that the process is the same in both. If this is so, his conclusions as to the time, order of progression, and exact histological changes in degeneration are valuable, and should lead to an examination for secondary degenerations, in recent as well as old cases of spinal-cord disease.—*Fortschritte der Medicin*, 1885, No. 9.

M. ALLEN STARR, M.D., Ph.D.

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b.—PHYSIOLOGY OF THE NERVOUS SYSTEM.

THE CONDUCTION OF EFFECTS OF IRRITATION FROM THE CEREBRUM TO THE EXTREMITIES.—Dr. Lewaschew has made a series of experiments upon this subject. He has not studied the effects upon the movements on the opposite side, but those on the same side as the irritation. All the experiments were made upon dogs under morphia, or morphia and chloral, with the induction current applied to the cerebral cortex. The movements of the posterior extremities were observed. If the cortex of the left hemisphere is irritated, then the weakest current calls out movement in the right extremity. By stronger currents the opposite posterior extremity is also moved. The inquiry arose, by what paths of conduction in the spinal cord was the irritation conveyed to the extremity on the same side as the irritation? In a dog, after both hemispheres were laid bare in the vicinity of the sulcus cruciatus, the spinal cord was hemisected on the left side at the level of the eleventh dorsal vertebra, so that the path of conduction only remained by the right half of the spinal cord. If, under these circumstances, the centre for the posterior extremity in the left hemisphere was irritated, then the result for both posterior extremities is the same. Hence the conclusion that the conduction from a hemisphere to the posterior extremity on the same side is not accomplished by conduction in the half of the spinal cord of the same side. Both posterior extremities have their primary centres in the lumbar part of the spinal cord. The

irritation which arises in one hemisphere goes within the medulla oblongata to the other half of the spinal cord and in this to the lumbar cord. If, in the above experiment, with left spinal hemisection, irritation of the cortical centre of the right extremity is made, then the left extremity is quiet, whilst the right is extended. Here the excitation goes first from the right hemisphere to the left half of the spinal cord, and from this above the level of the spinal section back to the right half of the cord. The transit from one to another half of the cord, through the gray substance, can take place at every level of the spinal cord. It has just been stated that after hemisection of the spinal cord the extremity on that side was quiet when the hemisphere of the opposite side was irritated, but it must be added that by strong irritation muscular contraction would ensue.—*Pflüger's Archiv*, Band xxxvi., Heft 5 and 6.

THE MINIMAL INTERVAL AT WHICH THE SUMMATION OF TWO MAXIMAL STIMULI OCCURS IN STRIATED MUSCLE.—Dr. Yeo and Mr. Herroun have made a series of experiments upon this point with frogs.

It was discovered by Helmholtz that the shortest interval at which he could appreciate the effect of a second stimulus, when two succeeding induction-shocks were allowed to enter a nerve, was $\frac{1}{600}$ of a second. Their results were as follows :

1. When two induced currents, each capable of causing a maximal contraction, enter a muscle in opposed directions, the stimulating effects are not summated at smaller intervals than $\frac{1}{150}$ of a second.

2. When two induced currents enter a muscle in the same direction, or two ascending currents enter a nerve, there can hardly be any limit fixed as a minimal time interval at which their effect is summated.

3. Degrees of fatigue which cannot be recognized by the effect on the general irritability of the muscle, or the form of the curve, are sufficient to prevent stimuli giving rise to summation at small intervals.

4. The most important time in determining the summation of stimuli applied to the nerve is the relative strength of the first and second stimulation. The first stimulus must not exceed the second in strength if summation at very small intervals is desired.

5. In stimulating the nerves with our coils two ascending currents are more effective in causing summation than two descending currents.

6. In indirect stimulation summation is soonest arrived at (with interval increasing from zero) when the part of the nerve near the muscle is stimulated first in point of time.

7. Beyond the short interval during which current interference comes into play, we do not get a subtraction from the height of the contraction given by a single maximal stimulus with two maximal stimuli with any direction of currents.

8. Increase of interval is never accompanied by a fall in the summated contraction, provided the second stimulus falls before or within the period of "ascending energy."

9. Having regard to the causes of variation given above, we do not find a sudden increase in summative effect to be constant at any one period of increment of interval.—*Journal of Physiology*, vol. vi., No. 3.

THE NATURE OF NERVE-FORCE.—Dr. Bowditch has made some experiments upon this point. The principal data of which account must be taken in every proposed theory of nerve-force, are:

1. The transmission of a stimulus along the nerve with undiminished intensity.

2. The exhaustion of the nerve by continued stimulation.

Upon an etherized cat the sciatic was divided near the sacrum and placed upon a pair of shielded electrodes of an induction machine.

The animal received then a dose of curare sufficient to prevent muscular contractions, and the irritation of the nerve was steadily maintained while the animal was kept alive. In the course of about two hours the curare was so far eliminated that the stimulation of the nerve which had been previously without effect began to produce muscular twitches which, as the elimination of the drug progressed, became more frequent and more violent. These experiments support the theory that nerve-force is transmitted by some sort of a molecular vibration after the manner of light or electricity. An argument of a negative character in favor of this view may be found in the absence of satisfactory evidence of chemical change or of heat production associated with the activity of the nerve, showing that no great amount of potential energy is set free in the process.

Physiologists have long been in the habit of comparing nerves to telegraph wires, since they seem to be indifferent conductors transmitting impulses equally well in both directions. It would appear from these experiments that the absence of fatigue in consequence of activity is another very interesting point of resemblance.—*Journal of Physiology*, vol. vi., No. 3.

ISAAC OTT, M.D.

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c.—GENERAL PATHOLOGY OF THE NERVOUS SYSTEM.

ANALYSIS OF THE NERVE-PHENOMENA IN ANÆSTHETIC LEPROSY.—W. Allen Sturge, M.D., in a paper (*Brain*, April, 1885) based upon the careful study of a case of non-tuberculated anæsthetic leprosy, reaches the following conclusions in answer to certain queries which he propounds—namely, (1) Is the lesion *central*,—*i. e.*, in the brain or spinal cord; or is it *peripheral*,—*i. e.*, in the nerves? (2) If peripheral, is it (*a*) in the trunks of the nerves? (*b*) in the finer nerve branches? or (*c*) in the peripheral

termination of the nerves? He concludes that both the sensory and motor phenomena are dependent upon a peripheral-nerve lesion, but that the former result primarily from implication of the terminal sensory filaments without relation to the distribution from any particular nerve-trunk, while the motor impairment depends upon the involvement of a mixed nerve-trunk. He was led to this view from the fact that the anæsthesia is superficial, not deep, and does not correspond to the distribution of one nerve, but creeps on, involving areas of skin without reference to the nerve-supply. On the other hand, the muscular atrophy occurs in the distribution of definite nerve-trunks, and not in muscles associated functionally to produce co-ordinate movements, as in certain spinal-cord lesions.

He explains these diversely located lesions, as regards sensory and motor phenomena, as follows: Pointing out the fact that the leprous condition has a strong tendency—in the non-tuberculated variety, at any rate—to advance by continuity of tissue, that the skin and nerves have a special tendency to be attacked, he infers that the nervous affection begins at the peripheral extremities of the cutaneous nerves, and, creeping up the nerve fibres, extends eventually to the main nerve-trunks. As the nerve disease has been shown to consist mainly of a cellular new-formation, accompanied by some hypertrophy of the connective tissue binding the fibres together, those fibres not already injured by the new growth become compressed and ultimately destroyed. As the disease begins in the peripheral extremities of these latter nerves, the motor nerves will not be affected until it has passed up the cutaneous branches to the main trunk, from which the motor nerve is given off. When this has happened, a whole group of muscles will be affected simultaneously—a group deriving its nerve supply from a common origin. He believes that muscle directly under the skin, as in the face, may be affected directly by contiguity from the skin.

He suggests the following points for investigation in future cases: (1) In cases of tuberculated and anæsthetic leprosy (typical tuberculated leprosy is non-anæsthetic), to notice the difference between the eruption of parts of the skin where sensation is healthy, and that of patches of anæsthetic skin. With a view to proving the secondary influence of nerve disease in checking the morbid growth in the skin. (2) Is anæsthesia always preceded by modification in skin nutrition? With a view to proving the independence of the nerve disease. (3) Does the primary invasion of anæsthesia ever give rise to patches of numbness corresponding to the supply of any named nerve? With a view to clearing up the question whether nerve-trunks are ever subjected to direct attack. (4) Does muscular atrophy ever take place without being preceded by anæsthesia? With a view to proving whether ultimate motor branches may be primarily affected, in a way similar to ultimate sensory branches. (5) When muscular atrophy has taken place, to make a detailed examination of the various

groups of muscles. With a view to confirming or confuting the conclusions arrived at above, in reference to the mode in which their atrophy is produced. (6) An investigation of the deep sensibility of parts beneath the anæsthetic skin, and a comparison of the deep sensibility of healthy muscles as compared with that of atrophied muscles.

A Case of Perforating Tuberculosis of Skull with Cerebral Symptoms.—Dr. Walter Edmunds reports (*Brain*, April, 1880) the case of a boy, æt. fourteen, who, after an attack of peritonitis, which was thought to be tubercular, developed a cold abscess in the scalp, over the left parietal bone, accompanied by much headache. It contained thick pus, and was twice aspirated. Six months later, numbness of the right arm and hand occurred; four months later, the abscess re-formed, and he had a fit, in which he felt giddy, fell, became unconscious, foamed at the mouth, bit his tongue, urinated involuntarily, had convulsive movements in both legs, with the right arm clinched and drawn up. Slight paresis of the right face and leg, with more marked paresis of the right hand, was found, with normal sensation, normal temperature and reflexes. No visual disturbance nor headache; both optic discs were slightly swollen, their images blurred; veins knotted, with white lines along the vessels. The abscess was laid freely open, and a portion of diseased bone, seven eighths by five eighths of an inch, was removed, comprising the entire thickness of the skull. It had compressed the brain. Under iodoform dressing the case progressed well, but there was some suppuration with loss of substance on the surface of the brain. He had one fit two weeks later, another eight weeks later, with general convulsions, head turned to the right. In about four months he was sufficiently well to get up and walk about. Weakness of the right arm and hand remained, and an opening in the scalp and skull, through which the brain could be seen. It was covered by a silver plate. The inflammation of the optic discs subsided, the sight remaining not quite normal. The opening in the skull was half an inch in front of the fissure of Roland, but as the superficial ulceration extended backward a short distance from the opening, the middle of the ascending frontal and ascending parietal convolutions were affected.

Acute Optic Neuritis Associated with Acute Myelitis—Sharkey and Lawford (*Ophthal. Soc. Trans.*, London).—A girl, aged seventeen, previously in good health, rapidly lost her sight, so that in four days she was quite blind, without other prominent symptoms. Well-marked double optic neuritis was found to be present a month afterward. Symptoms of paralysis and loss of sensation in the lower extremities supervened. About three weeks afterward the patient died of symptoms of peritonitis—that

is, sixty-two days from the time vision first failed, and twenty-nine days after the first appearance of symptoms of paralysis. A very careful account of the post-mortem examination is given in detail, showing the brain to be healthy. The spinal cord presented the appearance of acute myelitis of the lower cervical and the upper lumbar regions. The optic tract and nerves, along with the discs and retinæ, were accompanied by all the evidences of intense inflammatory change.

It is pointed out that the interest in this case lies in the association of an acute optic neuritis with acute inflammation of the spinal cord. There is probably some relation between the two, although the one does not depend directly on the other. In this case the optic neuritis appeared a month before the spinal symptoms. Post-mortem examination showed that the spinal cord between the lower cervical and lumbar regions was healthy, so that the centres of disease must have originated independently one of the other. The same may be probably asserted with regard to the optic nerves. Other cases have been published by Clifford, Allbut, Seguin, Noyes, Steffan, and Erb, in which spinal symptoms were associated with changes in the optic discs. Chilson has recorded (*Arch. Ophthal.*, 1882, No. 2) a somewhat similar case, but without post-mortem examination, and Dreschfield has published (*Lancet*, 1882) two cases, each with an autopsy, of acute cord disease accompanied by optic neuritis. These cases, moreover, prove that the occurrence of double optic neuritis in association with nervous disturbance is not of necessity due to cerebral disease.—A. Hughes Bennett in *Brain*, April, 1885.

Ocular and Trigeminal Affections in Locomotor Ataxia. —M. Galezowski states (*La Recueil d'Ophthalmologie*, 1884) that in locomotor ataxia visual acuteness is nearly always unequal in the two eyes. Patients may be unable longer to see green and red. On the other hand, reading at short distance is possible for a long time, while acuity of vision for distant objects is much diminished. M. Darier has shown that a much stronger electric current is required to produce manifestations of light in the beginning of ataxia than in toxic amblyopia. In the branches of the fifth pair which border upon the eye, anæsthesia and sometimes hyperæsthesia are observed. The spots where anæsthesia is present rarely are acknowledged by the patient, but to be discovered must be sought for with care. Sometimes patients complain of a feeling of heaviness in the periorbital region and in the face, can no longer feel the contraction of the muscles of this region, and frequently use the hand to assist the motion of the part. Hyperæsthesia is manifested by neuralgia or by lancinating pains similar to those experienced in the lower limbs. Excavation of the optic papilla, which resembles the changes due to glaucoma, accompanies these manifestations of pain.—*Amer. Four. Med. Sci.*, April, 1885. W. R. Birdsall, M.D.

d.—MENTAL PATHOLOGY.

INSANITY IN SWEDEN.—According to official statistics (*Allgemeine Zeitschrift für Psychiatrie*, 1884), the types of insanity under care in Sweden during 1881 were as follows :

	Male.	Female.	Total.
Mania	272	308	580
Melancholia	208	230	438
Secondary confusional insanity .	224	164	388
Paranoia	214	205	419
Dementia	205	181	386
Idiocy	37	38	75
Paretic dementia . . .	59	6	65
Epileptic insanity . . .	55	21	76
	794	615	1,409

There are probably more insane than these in Sweden, but they escape attention by reason of the population being largely rural.

AGE AND CURABILITY OF INSANITY.—Dr. Pliny Earle (Report of State Hospital, Northampton, Mass., for 1884) says : The question of curability and incurability, as reported by the superintendents of the institutions for the insane, is to some extent affected by an agent other than that of the duration of the disease before the patient is subjected to curative treatment in the hospital : the *age* of the patient. As a rule, persons in early and middle life are more likely to recover than those who are more advanced in years. This, of course, might be expected, inasmuch as they retain to a greater degree their original vigor of constitution, and are consequently more susceptible to the influence of remedial agents. But the practice is apparently increasing of bringing to the hospital persons of the latter class. Among the patients received in the course of the last year, there was one who was over eighty years of age, and no less than seven whose ages ranged between seventy and eighty years, three of them being seventy-five or more. It cannot be expected, unless in very exceptional cases, that persons so far advanced will ever recover their mental soundness. Most frequently the unsoundness is the consequence of old age, and the beginning of the breaking down of the constitution. Aside from the incurability of these patients, there is another question which has an important bearing upon the propriety of sending them to the hospitals. They have so long been accustomed to the independence of home, and to all their home-like comforts and associations, that the removal of them to a public institution, where that independence is measurably lost, and where they are subjected to new surroundings, as well as to a certain degree of discipline to which they have never been accustomed, but which is absolutely necessary to the best welfare of the inmates, has a detrimental rather than a beneficial effect. They cannot accustom themselves

to this new mode of life. It is strange and uncongenial. Under these circumstances, the little vigor of constitution which yet remains to them begins to fail, and their lives are brought to an end, not infrequently, much sooner than they probably would have been had not the life of home been exchanged for life in a public institution. Now while there is much soundness in these remarks, the fact cannot be denied that senile lunatics are both troublesome and dangerous to manage at home, as they are liable to commit arson, to be lascivious, querulent, and errabund, and to otherwise endanger themselves.

Inebriety as an Hereditary Influence on Insanity.—Dr. H. M. Hard (Report Michigan State Board of Health, 1884) says that, from all the facts which have come to his knowledge, he had no hesitation in saying that at least ten per cent. of all insane persons at present under treatment in his asylum owe their predisposition to mental disease to an inebriate heredity. The greater proportion of females inheriting this predisposition is due to the fact that daughters are much more liable to inherit the mental and physical characteristics and defects of their fathers, while sons inherit similarly from their mothers ; and for obvious reasons fathers are much more liable than mothers to transmit the degenerations and diseased tendencies which originate in alcoholic indulgence. In females, too, the tendency is to the development of a more active form of insanity, and the probabilities of recovery are correspondingly better. In males there is a relatively greater tendency to the development of degenerative forms of disease. This is probably due to the fact that when mental and physical characteristics are derived by males from the father the mental equilibrium and physical vigor are not as uniformly maintained as when these characteristics are derived from the mother, and hence the probability of a degenerative brain change is increased if the father is an inebriate. The same is also true of females when a neurosis is derived from an inebriate mother, whose characteristics they inherit. The female children suffer in relative frequency from the following psychoses : Mania, dementia, melancholia, epileptic seizures, and idiocy. Males suffer from dementia most frequently, next from mania, then from epilepsy, melancholia, and idiocy. If both father and mother are intemperate, there is an increased tendency to epilepsy or imbecility. If inebriety be present in one parent and insanity in another, an incurable form of insanity is very apt to be developed in the children. In the majority of cases mental disease develops itself at the period of life when the greatest strain comes upon the endurance of the individual—that is, between the ages of twenty and forty-five years. Between these years women suffer from the perils and accidents of child-bearing. They have the cares and responsibilities of families, and undergo the fatigue and exhaustion consequent upon the care of children and the nursing of the sick. Men

during this period labor the most constantly, and endure the greatest hardships. They encounter greater business perplexities, and assume larger responsibilities. The grosser passions are also more active, and the danger of exhaustion from this cause is largely increased. When the nervous energy and physical vigor of the individual are exhausted, the nutrition of the brain-cells is interfered with and irritative changes occur within them. These changes produce attacks of mania—a form of insanity characterized by excitement ; or melancholia—a form of insanity marked by depression, painful delusions, and morbid fears. If the original nerve constitution be unstable, as in the offspring of drunkards, there is a lack of recuperative power after the attack of excitement or depression is over, and the termination of the disease is in permanent weakening of the mind.

DELUSIONS OF PARETIC DEMENTS.—Kiernan (*Alienist and Neurologist*, April, 1884) says it is obvious that these delusions show not creative power but mental weakness, and by them the fact, that the mental condition is that of dementia, is demonstrable. Paretic delusions, as shown by the experience of representative alienists, are characterized by : 1. Lack of systematization. 2. Absence of logic. 3. Inherent contradictions. 4. Feeble creative power. These elemental peculiarities afford a basis for comparison with delusions of other psychoses.

CARDIAC SPHYGMOGRAPHY AMONG THE INSANE.—Dr. Salemi-Pace having shown that right cardiac atrophy is more frequently associated among the insane with left cardiac hypertrophy, Dr. Ribaudo has attempted, in thirty-eight cases of insanity (Atti del Quarto Congresso de la Societa Freniatrica Ital.), to diagnosticate this double lesion during life by means of the dulness of hypertrophy and the irregularity of the cardiac sphygmograms. These alterations are, in Ribaudo's opinion, not inflammatory in character, but nutritive, due to material changes in the trophic centres.

CIRCULAR INSANITY.—Dr. Martineuq (*Annales Medico-Psychologiques*, Serie vii., Tome i., 1885) concludes that in hereditary cases *folie à double forme* sets in in an abrupt manner, and often has from the onset the true type of circular insanity. Second, in non-hereditary cases, before presenting its true characteristics it presents the character of isolated attacks of simple insanity.

EPILEPTIC EQUIVALENT.—Dr. L. D. Mignault (*Canada Medical Record*, June, 1885) reports the following case of epileptic psychical phenomena taking the place of the convulsion. The seizures occurred as follows : Without warning the patient would suddenly lose consciousness, and, being possessed of a fixed idea,

would set to work to execute it mechanically. He at these times becomes very pale, the eyes are wide open and have a fixed expression. He answers quietly and reasonably any question which may be addressed to him, and will often even apologize for the trouble he is giving. He generally fancied that it was necessary for him to go to bed. Accordingly he would seek some room where he knew a bed was situated, and would undress and get into it. As often happened, being a teacher in an orphan asylum, he would manage to crowd himself into a child's cot and would, to his intense disgust, suddenly resume consciousness and find himself cramped and stiff from the exertion. On another occasion, while waiting for a train at a railway station, he started off to walk along the track. As he crossed a bridge, stepping from sleeper to sleeper, he was loudly shouted at by several persons, but he was still unconscious, and pursued his way for about four miles, when he was amazed to find that he had wandered so far away from his destination. He was very lame from infantile hip disease, and wore a cork-sole boot, which replaced the shortening due to disease. This case, it will be obvious, is of much medico-legal interest.

Late Recoveries from Insanity.—Drs. Reva and Algeri (Atti del Quarto Congresso de la Societa Freniatrica Italiana) conclude, that experience demonstrates that certain psychoses may recover after several years' duration ; that the psychoses thus recovering are systematized delusional cases in which the degeneration signs are absent or not well marked. An almost constant character of these psychoses is hallucinations, which remain invariable from the onset. In these cases there is marked intellectual vigor and activity during the progress of the psychosis.

Temperature in Acute Mania.—Dr. Walter Channing (*Boston Medical and Surgical Journal*, July 9, 1885) says that in acute mania there is usually elevation of temperature to an uncertain degree. It is of the direct type—that is, higher at night than in the morning, as a rule. There may be striking exceptions. The maximum point is reached early in the disease. The mobility of the temperature is considerable, especially in severe cases,—from one to five degrees. These marked fluctuations taking place at one to two degrees above normal, with great irregularity, and an occasional exacerbation of four and five degrees above normal, are to some extent characteristic. The occasional exacerbations indicate increased intensity of symptoms probably, especially those of a motor character. In favorable cases, considerable remissions shortly follow.

Psychosis Cured by Erysipelas.—Dr. Lauderer (*Algemeine Zeitschrift für Psychiatrie*, Band xli., Heft 4 and 5) reports a

case of melancholia in a girl of good heredity, which recovered under the influence of an attack of erysipelas.

MANIA TRANSITORIA.—Drs. Verga and Gonzales (Atti del Quarto Congresso de la Societa Freniatrica Italiana) define mania transitoria as a psychosis of short duration, which, under the influence of an immediate cause, leaps suddenly into existence once in a lifetime with great violence, without febrile disturbance, in a healthy individual who, during the attack, has no consciousness of his state. The affection is cured at the end of a deep slumber. They report two cases, and a third is added by Brunati.

TYPHOMANIA.—Dr. B. Ball (*L'Encéphale*, No. 2, 1885) believes that typhomania is closely allied to the infectious fevers, and that in all probability it is of microbic origin, and appears only in neurotic subjects.

REFLEXES IN PARETIC DEMENTIA.—Dr. A. Betten Court-Rodrigues (*L'Encéphale*, No. 2, 1885) says that he has examined sixty-eight paretic dements. In forty-three he found a marked exaggeration of the knee-jerk, and in two of these spinal trepidation was present eleven times. The knee-jerk was abolished, but of these cases two had developed from locomotor ataxia. In the cases the reflex was nearly normal. Expansive ideas were more frequent among the cases in which there was exaggeration. The cutaneous reflexes were very frequently abolished.

CEREBRAL LESIONS IN THE CHRONIC INSANE.—Dr. H. E. Allison Willard, New York (*Alienist and Neurologist*, July, 1885) says that: "There are probably no fixed and constant pathological conditions, in unvarying connection with every type of insanity, as the forms of mental alienation are now named and recognized; but to some degree a classification, depending upon brain lesions, has already been made, and, although this may not become the sole basis of distinction, its bounds will be enlarged in the future. While it is not true that we can determine before death, or after, the nature of these changes in all cases, neither is it true that insanity is a disease so evanescent and ethereal in character as to always leave no trace, or traces so slight as to be entirely microscopical, of its destructive action upon brains long affected by mental disorder. Aside from diseases naturally incident to its coverings and envelopes, from traumatism and constitutional disease, undoubtedly, the excessive functional use of the brain leads to alterations of structure, which eventually become more or less evident to view, and which are often capable of being demonstrated."

FAMILY CARE OF THE INSANE.—Dr. H. R. Stedman (Sixth Annual Report Mass. State Board of Charity) says: "1. A large proportion of these patients do not require asylum treatment, who, nevertheless, cannot for various reasons be suitably provided for among their relatives or friends. 2. Experience, both in this country and abroad, justifies the belief that suitable families can be found in this State to undertake the care of these cases. 3. If placed in these families, under systematic expert supervision and regular and competent visitation, these patients would be more comfortable than they now are; those who need it most could receive more effective treatment in the lunatic hospitals; and the expense to the State and the towns for the harmless insane would be considerably lessened." The immense mass of the chronic insane have, however, been cared for at home until such care is an impossibility, and what such care is, is shown by the sickening cases of neglect unearthed in Pennsylvania.

ÆTIOLOGY OF PARETIC DEMENTIA.—Dr. Reinhard (*Allg. Zeit. für Psychiatrie*, Band xli., Heft 4 and 5) concludes that social storm and stress stand in the first rank as causes of paretic dementia, that drunkenness comes next, but is least potential in men. Syphilis is in the third rank. Heredity plays but a slight part.

TRABECULA CINEREA IN THE INSANE.—Dr. Verga (Atti del Quarto Congresso de la Societa Freniatrica Italiana) says that: First, the absence of the trabecula cinerea is not of much importance. Second, it is much less frequently absent in the female. Third, it is more frequently absent in the insane than the sane. Fourth, it is frequently absent in epileptics, but when present is well developed. Fifth, it seldom presents an exaggerated development in the female Sixth, it is frequently absent or reduced in size in idiocy.

INSANITY AND DIVORCE.—Dr. C. H. Hughes (*Alienist and Neurologist*, April, 1885), discussing this subject, says: "Something must be done to lessen the growth of this horde of neuropaths, tainting the congenital fountains of normal mental life, and the remedy must come, if ever, speedily, through enlightened public opinion and just law. The church may declare marriage a sacrament, and dignify it as a contract of God's, which no man can put asunder, as if God smiles upon the union of weakly neuropaths, the fruit of whose loins and wombs can only be weaklings in organization, whose fate is sure to be inevitably miserable, for in life's stern struggle for existence, to be organically defective is to be defeated. The solution of the vexed problem is plain, where, of two contracting parties to a marriage, one at the time of the union was insane. The church may pronounce them joined together by God, but the law, placing

equal reliance upon the wisdom of the Almighty, but differently interpreting His will in the premises, will declare a compact null between an insane and a sane person, where matrimony is the consideration. But suppose a person with only the insane diathesis contracts a marriage? Though the father and the most of their families may have been insane, and insanity supervenes in either of them upon some slight mental strain, insufficient to even ruffle the minds of mental organisms inherently better endowed, the law gives no remedy, nor should it, in the majority of instances, as marriages are now made. But suppose the time should come when future consequences will be considered along with present interests, and the question should be asked as to insanity in the family or damaging nervous diseases, and false answers are given and marriage takes place in consequence, will the neuropath who makes a matrimonial contract on false representations be as liable as the party who falsely represents a horse or other property in order to dispose of it? The consequences of an insane or epileptic person marrying do not fall upon the parties to the marriage contract alone. Their immediate descendants are wronged. No one has a right to bring into being offspring organically greatly defective in brain. The unborn are thus wronged for life, without power or chance of redress. The State is thus wronged in the increased proportion of the imbecile, criminal, pauper, and other defective classes thus thrown upon its care. Society is wronged in the increased aggregate of misery placed in its midst. Neither the church nor the law should sanction such unions, and if some kind of remedy existed for marked organic mental defects, such as traumatic and clearly congenital epileptic insanity for instance, disastrous marriages of this kind would be consummated with more caution by the inherently defective in brain. If a handsome blooded horse is sold on a statement of a false pedigree, the sale is null. If a man or woman, though remotely of good family, but neurotically so defective that certain abnormalities of mental organism must be transmitted to offspring, enters into the marriage relation, such a marriage ought to be a nullity so far, at least, as the procreation of the race is concerned, and instead of laws being framed to punish for the prematurely induced birth of such post-natal mental abortions as are likely to result from such ill-chosen alliances, the prevention of such abnormal conceptions should be lawfully justified and encouraged. It were better that full-time children so defectively endowed should not be born, or, if born, should be born not viable. Wise and extremely cautious discrimination should be exercised when the law undertakes to interdict the procreation of offspring. Such prohibition should be securely founded on the higher law of pathological defect and descent, based on demonstrable and proven facts, not on conjecture or theory, and its steps should be slow and short and sure. Account would have to be taken of both factors—those tending towards race degeneracy on the one side, and those leading to race re-

generacy on the other. Mistakes may be easily made, such as have been made respecting the interdiction of the marriage of blood relations, by certain States, to prevent the engendering of idiots. To be safe and sure, law must be very deliberate, and guided only by the unerring revelations of science, and hereditary neuropathic degeneracy is a demonstrated fact. As such it is a subject for conserative sanitary legislation, as much so as the most destructive pestilence, and a certificate of normal organic nerve endowment should constitute an essential feature of the State's marriage certificate."

Psychical Symptoms from Operations.—Dr. M. Collins (*British Medical Journal*, April 18, 1885) reports the following case: "E. F., aged 23, put himself under my care a few months ago. With the exception of knee-joint disorganization, there was no actual organic disease; the circulation was feeble, and nervous system exhausted by protracted physical suffering and mental anxiety. He was pale, anæmic, dyspeptic, and restless; at an early age given over to pain, sorrow, and defective assimilation. Palliative treatment gave comparatively little relief. He was invalided for years. At his own request I consented to amputate the limb; but, before I did so, I explained the risks plainly to him. His nervous system was so distraught, that I considered him not unlikely to succumb to the shock of a capital operation. On March 1st I amputated at the lower third of the thigh, by the ordinary flap-operation. Esmarch's bandage was used, so that there was no hemorrhage. The operation was satisfactory in every way; the patient recovered from the effects of chloroform, and was able, after two hours, to take beef-tea and milk at intervals. Four hours afterwards he was progressing favorably. Soon, however, he began to talk wildly and incoherently, and to suspect his nearest and dearest relative. On arrival, I found him singing snatches of songs, whistling, trying to get out of bed, regardless of the pain in the stump. He was, however, very amenable to persuasion. Then, for a time, he remained apathetic, till he was again haunted by some hallucination, when he broke out into wild delirium. The pulse was small and quick; the pupils dilated; the extremities cold; the surface of the abdomen, chest, and his face were covered by a clammy perspiration. I administered morphia by hypodermic injection, to counteract shock and pain; and at the same time I ordered a liberal allowance of beef-tea, and free stimulation. All was to no avail; he died rapidly—as patients do sometimes of delirium tremens—eighteen hours after the operation. Major operations are sometimes, though rarely, followed by mania. This may be merely a coincidence; but I strongly suspect, when it does supervene, that the patients were already the subject of a deep derangement of the affective life, or of some obscure insane temperament. In such cases, it is well known that insanity may follow reaction

from the shock of even the slightest injury. In my patient's case, a state bordering on delirium tremens soon set in, and proved rapidly fatal. He was never intemperate, never subject to any innate vice of the nervous system."

J. G. KIERNAN, M.D.

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e.—THERAPEUTICS OF THE NERVOUS SYSTEM.

CAFFEINE AS A LOCAL ANÆSTHETIC. — Dr. Ferrier and Dr. Fauvel claim that caffeine is as good a local anæsthetic as cocaine. Dr. F. employed it to the almost entire exclusion of the latter in his practice. Dr. Laborde, on the other hand, was unable to obtain any anæsthetic effect with caffeine or theine (*Lancet*, May 23, 1885). Argyl-Robertson also obtained no anæsthesia, but mydriasis with a 16-per-cent. solution of caffeine (*Brit. Med. Jour.*, Jan. 3, 1885). These different results will probably be found to be due to difference in the preparations. It has already been shown that many preparations of coca are different alkaloids. The product of the second maceration of coca leaves, for example, contains a large amount of a derivative of hygrine (Panas., Calmelo). This has the property of producing mydriasis, but not anæsthesia. The product of the first extraction, on the other hand (pure cocaine), does not cause mydriasis. The high price of cocaine has caused manufacturers to extract the leaves twice. Very probably similar impurity will be found in caffeine.

APOMORPHINE IN NERVOUS AFFECTIONS.—Weil used apomorphine successfully in a case of singultus in a patient with tubercular meningitis. The singultus had resisted electricity, morphia, and atropia, and was so severe as to prevent sleep. He also reports (*Lyon Médicale*, 48, 1884) its successful use in a case of chorea, which was so severe as to cause insomnia, dysphagia, and emaciation. Immediate improvement followed and continued under hypodermic doses of apomorphia (2½ mgm.). The same writer also reports a case of cortical epilepsy successfully treated by this drug. The usual remedies had been given without effect. Subcutaneous injections of apomorphine continued for thirty-eight days caused the disappearance of the paroxysms. Dr. Lawrence also cured with apomorphine a case of hereditary hystero-epilepsy that had resisted every other treatment.—The *Therapeutic Gaz.*, April, 1885.

COCAINE IN THE TREATMENT OF THE OPIUM-HABIT.—Erlenmeyer was induced, by the difference of opinion regarding the value of cocaine and its physiological action when given to counteract the effect of the withdrawal of opium, to study the effect of the drug. E. employed Merck's preparation, and made 236 separate observations. He gave the drug subcutaneously in

doses varying from 0.005 to 0.06. Of the 236 injections, 232 were given to 8 different opium-takers, while the remaining 4 were given, for purposes of comparison, to patients without the habit. The qualitative effect of the cocaine in opium-takers was in every case the same. Whatever difference was observed was quantitative, and was independent of the dose. His results are summarized as follows: 1. Cocaine, in doses up to 0.1 per day, has no effect upon the cerebro-spinal centres. 2. In doses from 0.005 and over, it causes paralysis of the vaso-motor centres. This paralysis is indicated by the increased pulse-rate, dilatation of the arteries, lessened arterial distension (dichrotism), sweating, increase of temperature. This vaso-motor paralysis was always extremely transient, reached quickly its maximum, and 15–25 minutes after the injection completely disappeared. 3. Cocaine causes a feeling of warmth, which is both general and localized, in the epigastrium on an empty stomach; on an empty stomach, a disagreeable, almost painful, feeling of pressure and cramp in the epigastrium. As to the effect of the drug in allaying the symptoms following the withdrawal of morphia, E. found that it was decidedly beneficial. Under its influence all disagreeable symptoms subsided. This effect, however, is only transient, and the symptoms soon return. E. thinks that cocaine in its action takes the place of morphia, and is not antagonistic. The effect of cocaine after all morphia has been withdrawn is absolutely negative. All patients objected to cocaine on account of the feeling of depression, etc., excited by it. On the whole, cocaine is only of slight value as a substitute for morphia during the withdrawal of the latter. E. thinks that the different results obtained may be due to different alkaloids, extracted by different makers from the crude drug.—*Centralbl. für Nervenheilk.*, 1885, No. 13.

Chloride of Methyl in Neuralgia.—The *Therapeutic Gazette*, No. 7, 1885, gives the following facts regarding chloride of methyl, to which attention has lately been attracted in France. It is a colorless gas soluble in water, with an ethereal odor. It is easily liquefied by a reduction of temperature or by pressure, and when once reduced to a fluid form it possesses a great tendency to become vaporized, and at an ordinary temperature passes at once into vapor. In passing from the fluid to the gaseous state, it absorbs an immense quantity of heat, and the cold then produced is sufficient even to freeze mercury. For therapeutic purposes it is condensed in strong bottles, made of copper to prevent explosion, and allowed to escape by a tube in a fine spray, which is directed against a nerve for a few seconds. The patient at first experiences a sensation of intense cold, which rapidly gives way to a burning feeling. Frequently a single application will be sufficient to relieve the pain, but when the first fails it may be repeated once or twice with an interval of one or two days.

Morton Prince, M.D.

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MASSAGE IN NERVOUS DISEASES.

II.

TECHNIC.

By Dr. GEORGE W. JACOBY,

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a.—General Remarks.

A DESCRIPTION of the various modes of manipulating must necessarily be preceded by a few general remarks upon questions which, although they may be considered of minor importance, nevertheless conduce very much to the comfort of both patient and operator. The operator himself must be the possessor of certain personal qualities which will materially enhance his success in the application of massage. *Samuely* requires him to be endowed with a considerable amount of bodily aptness; by that is understood a strong constitution which is not easily fatigued, a fair amount of physical force, and no medium amount of mechanical dexterity. The hands of the operator also must receive attention. In addition to the care which must naturally be given the nails, so that they do not interfere with the manipulations, the hands must be strong and pliable; at the same time, however, being supplied with

a well-developed muscular cushion. The operator himself must have a thorough knowledge of the physiological action of the procedure, in order that each form may be chosen with a perfectly clear comprehension of the action desired to be obtained from it. For reasons that are evident and need no further elucidation, his anatomical knowledge must also be a thorough one. Furthermore, he must be able to make a correct diagnosis of the existing pathological condition, in order to be able to recognize and appreciate the indications and contra-indications for the employment of the treatment in general, or for the application of any one of the special manipulations. A change in the course or progress of the affection may require a change in the mode of treatment, and a case in which any special manipulation may have been of benefit at first, may soon become complicated by factors which make the cessation of all mechanical interference imperative. From these requirements, as shown by Samuely, it at once becomes evident that a layman can never become a thorough masseur, in the scientific acceptance of the term. The knowledge requisite to diagnosticate diseases is not possessed by laymen; and, consequently, massage, as applied by them, is always employed in an empirical and schematic manner, with occasional results so pernicious as to destroy all belief in its power of producing beneficial ones. Notwithstanding this fact, it is generally impossible, and neither is it requisite, for the physician to apply the massage himself.

As Schreiber has correctly shown, there is no reason to prevent us from utilizing the strength and bodily aptness of another, who may possess those essential qualities which we lack, in order to fulfil our purposes. To make proper use of another's superior dexterity, we must supervise each and every manipulation. It is the physician himself who must determine the advisability of employing massage in a given case; it is he who must decide upon the proper manipulation, and, if necessary, adapt it to the exigencies of the case. Then, by first demonstrating to the layman, and keeping a constant supervision until all minutiæ are understood and satisfactorily executed by him, then—and only

then—may personal application be dispensed with. It is absolutely wrong after giving a few superficial directions to turn the case over to any one who calls himself "masseur," but of whose capabilities we frequently know nothing, and then to rest satisfied that massage has been tried. The treatment by massage, particularly of affections of the nervous system, is not as mechanical as it may, upon first impression, appear. The mechanical treatment of a neuralgia, of writer's cramp, of a chorea, etc., requires modifications in each case, which must be thoroughly studied and understood. Attention to the minutest details constitutes one half the effect. If matters take an undesired course; if, by any oversight, a complication arises which may be attributable to the massage itself, it is the physician who has recommended its use who receives the discredit, and not the person who may have been selected to carry out his directions. Every educated physician has the requisite knowledge of anatomy and general physiology for the application of massage. If, in addition to this, he acquires the knowledge of its physiological action, the modes and manners of manipulating, and the indications for its use, he then possesses all the necessary requirements. Should the lack of bodily ability, or whatsoever other reason, prevent personal application, he can with perfect safety, of course, under the above restrictions, turn the mechanical ability of some one else to account.

This question of the necessity of personal application naturally suggests the use of instruments and mechanical devices, which are designed to replace or to diminish the bodily force which is to be employed. As will be shown later, there are some affections of the nervous system in which the use of mechanical devices is recommended, and particularly in one form of massage are they indispensable. As a general law, however, the rule may be laid down, that the hand is the best and most adaptable instrument that can be employed, and that no product of mechanical ingenuity has as yet been able to act as a substitute for it. This principle, which is now acknowledged as cardinal by the best authorities, was formerly not accepted as true. *Estradère*, in his

book, has a chapter entitled "Arsenal du Masseur." He is fortunate in his choice of a title, for it is indeed an "arsenal," and although he attempts to reconcile us to the idea of using the various instruments, by first informing us that this "arsenal" is very simple, he at once proceeds to dispel this impression by devoting a large space to the description of some peculiar and, from an historical point of view, interesting instruments. He speaks of "strigiles" or raclettes" of "brosses," "gants," roulettes," "palette," "faisceau de branches," etc. That this idea of using mechanical apparatus for the application of massage is not yet relinquished by every one, is shown by the phenomenal success, financially, of the Zander Institute in Stockholm. The fertile brain of Dr. Gustav Zander is to be credited with the plan of manufacturing massage to order, and dispensing it in quantities sufficient to supply the demand. This plan of producing massage by steam and applying it mechanically by means of specially constructed apparatus, as an immediate result, led to the establishment of "Zander" institutes in London and St. Petersburg. Helsingfors, Abo, and other Swedish towns are also thus supplied, and they are all successful, if the number of patients treated is any criterion. A similar institute has only lately been established in Baden-Baden, and has been described in a monograph by *Heiligenthal.* In this book, the manipulations produced by the various machines are divided according to the "Ling" system. When the fact is considered that each manipulation or movement requires the use of a separate apparatus for its execution, a simple enumeration of the movements performed is sufficient to give an idea of the complexity of this system. The active apparatus alone, that is, those in which the patient himself performs the movement and the machine furnishes the opposition, comprise the following movements: (A1) "Arm-Wechseldrehung," pronation and supination of the forearm. (A2) "Arm-Erhebung," arm-lifting. (A3) "Arm-Adduction." (A4) "Arm-Abduction." (A5) "Arm-Senk-Beugung," flexion with downward movement of the arm. (A6) "Arm-Rollung," rotation of the shoulder-joint. (B1) "Knie-

Beugung," flexion of the knee. (B2) "Knie-Streckung," extension of the knee. (B3) "Bein-Abduction," abduction of the leg. (B4) "Velocipedengang," velocipede movement. (B5) "Hueft-Knie-Beugung," hip-knee flexion. (B6) "Hueft-Knie-Streckung," hip-knee extension. (B7) "Fuss-Rollen." (C1) "Sitzende-Rumpf-Streckung." This class of machines, known as the active ones, is, of all, the least objectionable, because the amount of force to be employed is, to a great extent, dependent upon the will of the patient himself, and it may, therefore, be increased or decreased at pleasure. But when it comes to the employment of brute force, metal moved by steam, the control of which is entirely taken away from the patient, as is the case in the "Erschuetterungsmachine" (concussion-machine) and "Hackungsmachine" (chopping-machine), then it is not possible to do otherwise than unreservedly condemn them, and with them the entire system as pernicious and possibly injurious. The last two illustrations in the book referred to, show the method of kneading the arm and the leg, and to them the reader of this article is referred, for further proof of the superiority of hand massage over machine massage. The author himself, by means of these illustrations, does more to condemn the system than any opponent of it could do in pages of writing. If now we reproduce here the "prescriptions" of the manager, for various affections, we show the ludicrousness of the system in its entirety. The letters and figures in the following, refer to the various motions as given above, A referring to the arm, B to the leg, and C to the body. "Exercises for rheumatic complaints and stiffness of joints. (*a*) In the upper extremities: A1, A2, A3, A4, A5, A6, A7. (*b*) In the lower extremities: B1, B2, B3, B4, B7, B8. Against sciatica: B3, B4, B5, B6, C3, C4, C5, C6. Against lumbago: C3, C5, C6."

Thus the convenience of dosing massage by means of printed prescriptions has reached its culmination. From these facts it becomes evident that the only requisites for applying this kind of massage are for the manager to be the possessor of the necessary financial capital and a full set of

printed prescriptions. Is it surprising that these institutions are successful? Even the Swedish-movement cure, which is so closely allied to massage, has retrograded, instead of advanced, since machines have taken the place of the human hand. It is to be regretted that the introduction of machines into this system will necessarily prevent its spreading, and that it will remain practically confined to Sweden itself. Attention must also be called to certain remarks upon the application of massage which were evidently first made by an author whose practical experience was considerably less than his theoretical knowledge, and these remarks have then been blindly copied by others, their correctness being taken for granted. In no other way can we understand the statement made by *Haufe*, *Samuely*, and others, that the part to be massaged must first be shaved, because by pulling upon the hairs acne pustules are easily developed, and these may for the time being interfere with the application of the massage. The fact, however, is, that there is never any necessity for shaving the part, as, unless the operator's hands are very rough, which they, of course, should not be, no such pustules are produced. Should, however, one or more pustules be present, from whatsoever cause, they do not in any way interfere with the continuance of treatment, as the hand of the experienced operator instinctively avoids them. Another erroneous opinion, which prevails extensively among writers on massage, is that the technic can be learned only by direct observation. The first person who took a decided stand against this view was Schreiber, at the meeting of German naturalists, held at Salzburg in 1881. There can be no doubt that he is correct. As already stated, a thorough knowledge of the physiological action is necessary; in addition to this, some clear description of the manipulations must be taken as a guide. No such description, however, can be followed blindly. Circumstances will of themselves force the adoption of modifications. Whoever does not possess sufficient ingenuity to adapt accepted methods to the requirements of a given case, is not qualified to learn the technic of massage, either with a teacher or without. It cannot be denied that a person can learn

quicker from observation than from writings, but it must again be reiterated, the use of a teacher is not imperative. To establish a general plan of treatment for each and every affection, as Phelippeaux has done in French, and Bela, Weiss, and Schreiber have done in German, is superfluous. To say such and such an affection "must be treated for five months" is ridiculous; or, as has been said by some, that a single application has cured their patient, would lead us either to suspect the accuracy of their assertion, or to question their powers of discrimination between cause and effect.

The amount of force to be employed in each manipulation must naturally depend upon the extent of the pathological changes and upon the impressionability of the subject. It will be found that patients suffering from any nervous affection cannot be subjected to massage for as long a period as others. The first séance is generally more painful and irritating than subsequent ones. The impressionability of the cutaneous nerves decreases markedly after repeated manipulation. It is, therefore, always well to follow *v. Mosengeils* advice, and apply gradually increasing and decreasing pressure. The number and duration of the applications will also depend upon the peculiarities of each individual case. The number may vary from one daily to one at intervals of several days, and the time from several minutes up to half an hour. More than one séance daily of twenty minutes' duration is very rarely indicated.

A few words must also be devoted to a form of massage, recommended particularly in the treatment of diseases of the nervous system, know as "electro-massage."

The employment of electricity conjointly with massage, making use of the one as an adjuvant of the other has been advocated by several persons, and even by *Mezger* himself. Within the last few years, however, it has occurred to various physicians that special advantages might be obtained by combining the two, and thus applying both massage and electricity simultaneously. For this purpose various instruments were invented, two in particular receiving considerable attention. Both of these consist of rollers, which are

designed to take the place of the hands in the application of the massage : the one, which is best known in Europe, allows an electric current, generated in a battery, to pass through it ; the other, which is extensively used here, generates the electric current itself, on the plan of the old magneto-electric machines. The idea which led to the employment of these instruments was probably that the application of these therapeutic measures would be thus simplified. There can be no doubt whatever that this procedure does simplify matters—for the physician,—but whereas he is the gainer in time, the patient is the loser in every other way, and for the following manifest reason : The hand is replaced by an instrument which can by no possibility allow of more than one form of movement, and this must always be executed in one and the same manner, almost the entire benefit of the massage being thereby lost. What has been said above about instruments in general, applies with the same force here. As regards the electrical part of this mode of treatment, it suffices to say that it has been a mystery to us how any physician with the slightest knowledge of the physiological action of electrical currents can apply them in this manner, with the expectation of attaining any beneficial results.

In short, a good masseur rarely uses any instruments except his hands, and if the use of electricity is also indicated in a given case, it is to be applied by means of ordinary batteries, and in the usual way. Massage is no exclusive method, it is only one remedy out of our vast therapeutic equipment. It is frequently necessary to employ electricity together with some form of massage, and when it is, then let us employ first the one and then the other, and not deceive ourselves and our patients by making use of any electro-massage bauble.

b.—Classification.

The word massage, derived from the Greek verb *μασσειν* to knead, to handle, in its most restricted sense only comprises one form of manipulation. But usage has so enlarged its significance that almost every author makes use of it to

embrace the manipulations or movements which he is in the habit of recommending. Thus it will, by one author, be used to embrace all forms of mechanical manipulations, even including medical gymnastics; and another restricts its use entirely to one or more nanœuvres. Therefore, under the one circumstance, the word expresses too much; and under the other, too little. If applied only to the mechanical manipulations, as it generally is, it certainly has not sufficient breadth, because, as will be shown, active movements also play an important rôle in this mode of treatment. For this same reason the substitute proposed by the French for the word massage, "Manipulations thérapeutiqus," is insufficient. *Rossbach*, in order to avoid the use of the word "massage," employs the title "stroking and kneading"; but as he, in the body of his article, speaks of percussion and active movements as constituting important factors in this method of treatment, it at once becomes obvious that the title chosen is insufficient to express the ideas entertained.

Notwithstanding the fact of Estradère's complexity, the classification of the various manipulations is very simple. Estradère divides the single manipulation, percussion, into "Hachure," "Clacquement," "Vibrations pointées, Vibrations profondes, Vibrations à poing fermé, la palette," and "Flagellations." Many others have not only followed him blindly, but have still further subdivided and then again redivided each subdivision, until it would seem that the possibility of any further "invention" in this domain is removed. Rossbach has justly and pointedly remarked: "All that can be accomplished by this method can be done by means of 'stroking, rubbing, kneading, and beating.'" If to these we add the class of functional movements, as suggested by *Bruberger*, we have all the subdivisions that are necessary to remember, and the elevation of each slight variation to the dignity of a special manipulation becomes superfluous. The more minutely we subdivide, the more do we succeed in obscuring the entire method, and in making it appear more complicated than it really is. The operator, when he is performing tapôtement, will, whether he is

beating a muscle or a nerve, modify his procedure according to locality and the exigencies of anatomical conformations. Were he, each time that he deviates from the classic type of perpendicular percussion, to give each deviation a new name, he would ultimately possess almost as many names as we have operators, and would arrive at the same bewildering results which some of our predecessors have attained, and for which they have become justly celebrated.

Mezger and his pupils, Berghman and Helleday, only describe four kinds of massage:

1, Effleurage; 2, M. à friction; 3, Petrissage; 4, Tapôtement; and the majority of writers—Haufe, Gautier, Little and Fletcher, and Reibmayer—follow this plan.

The classification which I shall adopt is that of Bruberger, and to each term I append the significance to be attached to it.

1. Effleurage—Stroking. The maximum of force to be applied not to exceed the dead-weight of the hand.

2. Massage à friction. Energetic stroking with one hand and strong circular movements with the other.

3. Petrissage—Kneading. A methodical vertical pressure applied to the muscles with the fingers, hand or fist.

4. Tapôtement—Percussion. A tapping, beating, or pounding with the hand, percussion hammer, or other apparatus. Includes nerve vibration.

5. Functional movements. Passive, active, or duplicated.

Effleurage—Stroking.

Stroking is nothing more than a very light, centripetally propelled pressure. It is executed in the following manner. The volar surface of the ends of the fingers, or of the entire hand, having been applied to the part to be massaged, at a point situated more peripherally than the affected portion, is then pushed centripetally forward and a short distance beyond that part. When this hand has reached its destination, the other hand is placed at the starting-point, and the same movement executed. Meanwhile the first hand has been brought back, so that by the time the second

one has fulfilled its purpose, it is ready to begin again. This is then repeated with regularity. The time to be devoted to each stroke will vary very much, the strokes also following with more or less rapidity.

The amount of pressure to be applied is not to exceed that of the dead weight of the hand. Effleurage of the extremities may also be executed in such a manner that the thumb and first finger are widely separated like a V, and the extremity grasped between them. Mosengeil advocates the use of a certain amount of pressure in this manœuvre; in fact, he recommends varying the pressure from moment to moment, so that it becomes undulating in form.

Massage à Friction—Rubbing

is a forcible pressure with a concomitant motion of the hand forward. This manipulation may be executed in various manners. The points of the fingers having been applied to the affected part, pressure is exercised, and they are then moved in large or small circles, or simply to and fro, the pressure being maintained. For this purpose, the ends of one or more fingers may be employed. If a particularly great amount of force is desired, the first phalanx of the thumb of the left hand may be applied to the spot, and pressure exercised upon its dorsal surface with the thumb of the other hand, the rubbing then being executed with both together. By this means we are enabled to act upon deeper-lying structures.

Rubbing and stroking ought to be combined in such a manner that the operator simultaneously executes the one with his right hand and the other with his left. In this way the one hand performs circular or linear rubbing, while the left is occupied in executing centripetal strokings. This procedure, of using both hands simultaneously, but each performing a different motion, is one which affords a great deal of difficulty to many. The incoördination of movement which is caused by the unsymmetrical use of the hands, is frequently so great and insurmountable that this entire form of massage, which presents many great advantages, must be renounced. In this case the rubbing will have to

be applied first and then the stroking, continuously alternating between the two.

Mezger considers the simultaneous use of both movements as a *sine qua non* of massage à friction, and v. Mosengeil also explains it as a combined manœuvre which both hands execute.

Petrissage.

This manipulation, which is a kneading in the true sense of the word, may be applied wheresoever soft, graspable tissues are present, and very intense effects may be attained by it. The part to be acted upon, generally a muscle, is grasped between the thumb and index finger, or between the thumb on the one side and the four fingers upon the other. It is then isolated as much as possible and lifted out of its bed, at the same time pressure being exerted upon a certain part. Then those parts more centrally located are taken, until the entire muscle has been acted upon. For this purpose either the points of the fingers or the pulps of the terminal phalanges may be used. If the points of the fingers are employed, the procedure is certainly rendered more energetic, but at the same time much more fatiguing for the operator.

Petrissage may also be rendered more energetic, when acting upon large parts, by using both hands. These are then placed side by side, at right angles to the axis of the limb, and are then moved in opposite directions. While the thumb of the right hand, for instance, is pressing directly upon the tissue, the fingers are also exerting a pressure, but at the same time are pushing the tissues in the opposite direction, away from the left hand. The left hand meanwhile is executing the same movements, pushing the tissues away from the right hand. This traction, which is exerted upon the muscles, combined with the lifting of the muscle out of its bed, is particularly important, as by this means the muscular and nerve fibres are not only kneaded and pressed, but are also extended or, if necessary, hyperextended, and this extension constitutes one of the main factors of success.

Pressure, which is in reality only a part of petrissage, the parts being left in situ and not lifted up, may be executed either with the points or the pulps of one or more fingers; or the second phalanges themselves, the entire flat surface of one or more being employed, may be used. If it is deemed requisite to exercise a still greater amount of pressure, the knuckles or the entire fist may be employed. The manipulation of petrissage is, as may be surmised, particularly serviceable in affections of the muscles. Those muscular swellings which are so frequently met with in the course of chronic rheumatism or sciatica, are especially benefited by this procedure. It is also of value in muscular paresis from disuse, as also in atrophy of muscles, occurring from whatever cause.

In the muscular atrophies the lost electro-excitability may frequently be restored by means of petrissage. Berghman and Helleday say in this regard: "When it seems radically lost, we have seen it return after several séances, without having resorted to any other mode of treatment." It is always important, then, in these cases, to verify the improvement by controlling our observations as to the state of contractility by means of the induced current.

Tapôtement is simply percussion of the affected part, either with the palm of the hand, the fist, the curved finger, a percussion hammer, or other instrument specially adapted for the purpose. Percussion without instruments is, as a rule, performed with the points of the fingers, these being semiflexed, and the movement of the percussing hand taking place at the wrist. It is this form which is most applicable over superficial nerves. When it is deemed desirable to act more energetically upon deeper-lying structures, generally large muscular groups, the wrist-joint must be stiffened, the fingers held firmly extended, and motion allowed to take place at the elbow and partly at the shoulder-joint, the hand of the operator thus meeting the body of the patient at right angles.

Instead of the points of the fingers, the ulnar edge of the extended hand or fingers may also be employed; the edge of the hand being used for more profound, that of the

fingers for superficial, action. In the former case, the movement is executed lightly at the wrist-joint; in the latter, at the elbow.

For very superficial action, especially over an extended area, the flat hand, or the hand hollowed like a boat (Tapôtement à air comprimé), is particularly serviceable. By this means, the terminal nerve filaments in particular are acted upon. By means of the hollow hand, a certain amount of elasticity is obtained, which cannot be produced by the use of the flat hand. A cushion of air is hereby retained between the palmar surface of the hand and the part to be percussed,—the air being then used as an intermediary agent.

In consequence of the very intense effects which may be produced by the very simple procedure of Tapôtement upon the physiological action of nerves, muscles, and blood-vessels, it is essential to pay particular attention to the number and velocity of the beats, and to the length of time to be devoted to its application. Therefore, the indications for its use are to be well weighed, and the mode of its application must, each time, be adapted to the individual case.

Tapôtement is particularly serviceable in diseases of the nervous system; so much so, that if our treatment of these affections were limited to any single form of massage, we would unhesitatingly choose Tapôtement. It is in this form of massage that we consider the use of instruments not only permissible, but in very many cases indespensable. It may easily be understood that, particularly in such instances in which it is desirable to distinctly localize the blows, when the rapidity with which they follow each other is very great, and when regularity is of importance, these factors may be more easily and more satisfactorily obtained by a mechanical device than by the hand alone. The instruments that we make use of in Tapôtement are the following: For general Tapôtement, in which localization of the blow is not of prime importance, two; and for precise, localized percussion, three.

The first two are: 1, Klemm's Muscle-beater; 2, india-

rubber balls attached to whalebone handles, as first suggested by Douglas Graham.

The second class consist of,

1. The ordinary percussion-hammer.

2. An electric percuteur designed by Mortimer Granville.

3. A tuning-fork percuteur.

The importance of percussion in the treatment particularly of peripheral nervous affections, renders it necessary to devote space to the description of these instruments.

Klemm's Muscle-beater.

This instrument, constructed by C. Klemm, director of an institution for mechanical gymnastics in Riga, consists

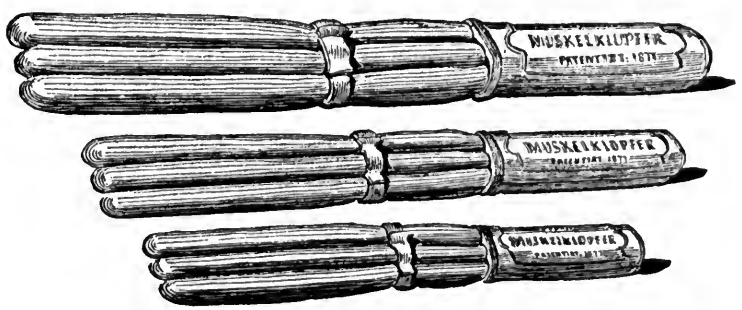


Fig. 1.

KLEMM'S MUSCLE BEATER.

Sizes 1 *a*, 2 *a*, 3 *a*.

of three rubber elastic tubes, connected at one end and attached to a handle. These instruments are made in different sizes, varying in the length of the tubes, as also in the diameter of their walls.

It is important to select the proper size, according to the part to be acted upon; the smallest and softest for the head, and the largest for the trunk and extremities, and for the purpose of producing a general hyperæmia. To facilitate this selection, Klemm has authorized the construction of nine different sizes. These are distinguishable, firstly, by their different lengths, 1, 2, and 3; and, secondly, according to the diameter of their walls, *a*, *b*, and *c* (see figure 1).

1 *a*. Long and thick. 1 *b*. Long and medium. 1 *c*. Long and thin.

2 *a*. Medium length and thick. 2 *b*. Medium length and thickness. 2 *c*. Medium length and thin.

3 *a*. Short and thick. 3 *b*. Short and medium. 3 *c*. Short and thin.

The second instrument used, consists of a rubber ball, either hollow, or packed with cotton to give it more weight, and attached to a handle of whalebone, the length and

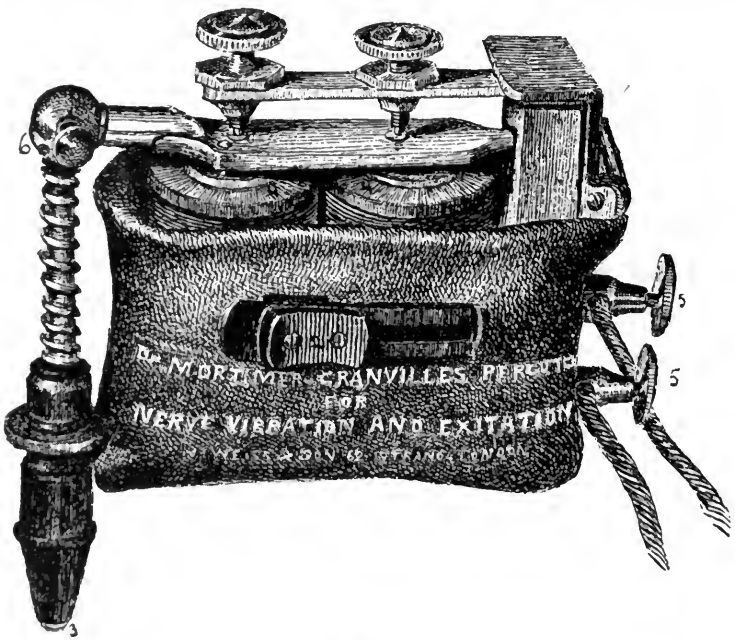


Fig. 2.

GRANVILLE'S PERCUTEUR.

1. 1. Contact Pins.
2. Current Interrupter.
3. Removable Ivory End.
4. 4. Coils.
5. 5. Binding Posts.
6. Screws for Attaching Ends.

thickness of which varies according to the amount of elasticity desired. Of the second class, the first, our ordinary percussion hammer, needs no description. In the use of the above instruments the movement must be executed entirely from the wrist, and not, as is frequently done, with the entire arm; by this means a great deal more elasticity

and delicacy of the blow is obtained. The percuteurs which I make use of are, as already mentioned, two—an electric percuteur and a tuning-fork percuteur. The first is that devised by Mortimer Granville, of London. The motive power in Granville's original instrument was a coiled watch spring contained in the instrument itself. By this means great facility of transportation was obtained, but this advantage was outweighed by a number of faults, so that all in all the instrument cannot be considered as a satisfactory one. Granville himself soon recognized its defects, and acknowledging that portability is after all only of secondary importance, he had constructed an instrument which is moved by electricity. This instrument consists of a strong electro-magnet which is operated by a portable battery. This electro-magnet works an ivory-tipped percussor, in the same manner as the tongue of an electric bell is moved. The analogy of this instrument to Haidenhain's tetanometer, used in physiological experiments, will at once become apparent. Upon the top, the instrument is furnished with two contact pins, one at the commencement and the other near the end of a metal arm. These, by shortening or lengthening the armature of the electro-magnet, give different rates of percussion. Upon the side of the instrument is an interrupter, so that the current can be made or broken at will. The ivory-pointed percussor is removeable, and various-shaped ends may be employed, according to the requirements of the case.

The tuning-fork percuteur really owes its origin to the experiments which Vigouroux conducted with a sounding-box at Charcot's clinic, in Paris, in 1878. He made use of a very large tuning-fork mounted upon a sounding-box, the vibration in it being set up by a violin-bow. The results obtained in these experiments were, to say the least, astonishing. The patients, however, were all hysterical subjects, and it was therefore difficult to say whether the phenomena produced (Transfert, disappearance of anæsthesia and contractures) were attributable to the influence of the sound-waves or not. It is essential to remark here, that in these experiments the apparatus was not in any manner brought

into contact with the patient. At any rate Vigouroux concluded that if with sound-waves alone he was able to obtain such intense effects, he would with precise localization obtain still more energetic and unvarying results. He,

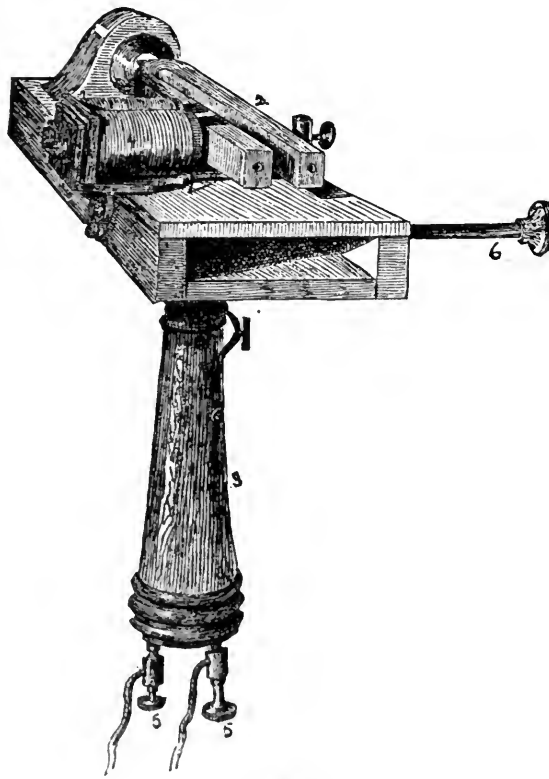


Fig. 3.

TUNING-FORK PERCUTEUR.

1. Sounding-Box.
2. Removable Tuning-Fork—Small One Attached.
3. Handle with Interrupter.
4. Coils.
5. 5. Binding Posts.
6. Removable Ivory-Pointed Percussor.

therefore, had placed upon the sounding-box a stem which was designed to be placed directly upon the muscle or nerve to be operated upon. With this step however, as Bondet de Paris has already observed, the entire aspect of affairs is changed, for instead of acting with sonorous vibrations,

the entire action is now produced by a pure mechanical excitant, nerve or muscle percussion, and the result, nerve vibration. Bondet then had constructed a smaller instrument for therapeutic purposes, and since then has employed it with excellent results, particularly in the treatment of peripheral neuralgias. I have not been able to obtain one of these instruments, but from a description I have had constructed the following, which I think possesses some advantages over Bondet's.

My instrument consists of: A sounding-box of seven inches in length and three inches in width. Upon this is electrically mounted a removable tuning-folk. Into the under surface of the sounding-box a handle furnished with

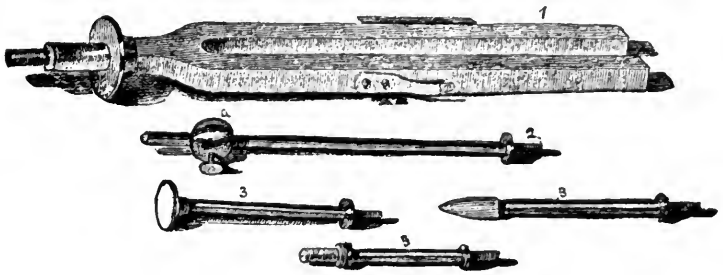


Fig. 4.

1. Large Tuning-Fork.
2. Attachment Piece for Regulating the Rate of Vibrations.
   a. Adjustable Metallic Ball.
3. 3. 3. Ivory-Tipped Percussors.

a current interrupter may be screwed. Upon the side of the box, at that point where the vibrations are most strongly perceived, a hole has been bored, into which the metallic rods which serve as percussors are to be screwed. These rods are furnished with ivory tips, and it is these which are placed upon the nerve. The instrument possesses two different tuning-forks of different lengths, and giving a different set of vibrations. These tuning-forks are interchangeable at pleasure. Besides this there is also another means of changing the rate of vibrations. Into the end of one arm of each tuning-fork is bored a hole, into either of which can be screwed an attachment piece. This attachment piece consists of a metallic rod upon which slides an adjustable

metallic ball, and thus the nearer the end of the rod the ball is fastened, the lower the rate of vibration obtained.

The smaller tuning-fork gives about 270 vibrations per second, and these may, by means of the attachment piece, be reduced to from 230 to 190. The large tuning-fork gives about 175 vibrations per second ; with attachment piece, from 160 to 130. I am thus, by means of the interchangeable tuning-forks and the attachment piece, enabled to diminish the number of vibrations from 270 to 130 per second, an arrangement which is not referred to by Bondet, and which I, for reasons given, consider of the utmost importance. There may be other differences between the instrument I use and Bondet's, but I am unable to say what they are, if any, but I do not believe that they in any way render the action of the two instruments dissimilar.

Now as regards the advantages of either the tuning-fork percuteur or Granville's percuteur over the other, or the choice in a given case, I can only say that it is necessary to possess them both ; a single one will not suffice. In neuralgias of larger or more deeply situated nerve-trunks, such as the sciatic, peroneal, radial or ulnar nerves, the instrument of Granville will be found the more serviceable. The blows are more intense and more precise. In neuralgias of superficial nerves, particularly where the nerve is compressible between skin and bone, and most particularly in trigeminal neuralgias, the tuning-fork percuteur is the only instrument to be used. With this we really do not have any direct blows, but the vibration of the instrument is communicated directly to the nerve.

Movements.

In addition to the manipulations already described, it is, as already stated, necessary to add another class which, in reality, belongs to medical gymnastics, but which has been appropriated within the last few years under the general name Massage, and with justice. These are the so-called functional movements. This is a very important form, fully as much as any of those already described. These movements may be divided into :

1. Passive movements, those which are executed by the operator without the aid of the patient. In its widest meaning this division may be held to embrace all the true manipulations, but actually it includes only movements of the various joints in a manner corresponding to their physiological action. These movements are flexion, extension, rolling outwards and inwards, and circling. The extremity is fixed by means of the left hand being placed directly above the joint which is to be moved; the right hand then grasps the extremity at a greater or less distance below the joint, and an attempt is made to execute whichever physiological movement is desired.

2. Active movements; those which are executed by the patient himself without receiving any aid from the operator. These can only serve as a complement to passive movements, presupposing that the patient has arrived at that stage in which he possesses sufficient muscular power to execute them. They consist of adduction, abduction, extension, and flexion; in short, the execution of all the normal movements of a joint by the patient himself. These movements really fulfil a double purpose, for they not only serve to strengthen the affected muscles, but they serve as an instructor, teaching the patient that which he has, to a certain extent, forgotten, and which, by long disuse, has become faulty—namely, the correct use and combination of the various groups of muscles.

3. Opposed or duplicated movements are such as require both the aid of the patient and that of the operator. The action of this class is very important, particularly in those cases in which it is desirable to strengthen single groups of muscles. These movements are executed in two different manners: either (*a*) the operator opposes his force to that of the contracting muscles of the patient, the extremity being extended; or (*b*) the patient flexes the extremity and the operator endeavors to extend it. The first class, in the Swedish-movement cure, is called concentric duplicated movements; the second, eccentric duplicated. Therefore, concentric are those in which the patient executes the movement himself, and the operator furnishes the opposi-

tion, or impedes the execution of the movement. Eccentric opposed movements, on the other hand, are those which are executed upon the patient by the operator, while the patient endeavors to oppose them. It requires a great deal of tact and experience on the part of the operator to judge correctly, in each case, of the amount of force to be employed. According to the relation which exists between the strength of the operator and that of the patient, the point of pressure must be chosen near to or far from the joint, in the latter case the operator being aided by the increased leverage. The opposition must always, in the language of *Schott*, be applied to the "advancing surface": thus, "upon the volar surface of the forearms, if the two arms are to be approached to each other; upon the dorsal surface, if, from being in contact, it is designed that they should be separated from each other.

The opposition of the operator should never be so strong as to entirely prevent the desired movement. The resistance interposed must therefore always be regulated so as to be proportionate to the muscular power of the patient. It stands to reason that patients enfeebled, from whatsoever cause, should not be made to expend a greater amount of energy than that which they can give and still feel at ease. The pressure must always be equally exercised, so that the movement is executed smoothly and gradually by the patient, and not suddenly and spasmodically. It is hardly necessary to add, that for the application of these movements the joints must be perfectly free, so as to be unhampered in their movements.

Douglas Graham justly also calls attention to assistive movements as being but little understood and seldom used. As he says, they are of great benefit in cases which are on the road to recovery, but which need a stimulus in order to make them exert the full amount of muscular power that they are capable of developing. Thus, in a peripheral paresis of the deltoid, if the muscle is not entirely incapacitated, but able to develop a certain small amount of its normal power,—if in this case the patient endeavors to use his deltoid, he cannot do so. But if the operator lends his

"carefully graduated assistance," the movement will take place, and thus, by dint of perseverance, together with other forms of massage, the muscle will gradually regain its original contractile power.

Massage of the Neck.

A very important method of massage, and one which is not by any means as well known as it deserves to be, is effleurage of the neck, or neck-massage. This manipulation is particularly of service in central changes; in fact, it is the only form of massage by means of which we have any influence upon the brain itself. This method was first described by Dr. *Gerst* of Wurzburg.

Gerst, after having satisfied himself that effleurage exercises an energetic, depletory, and absorbing action upon traumatic exudations of the extremities, even when applied at some distance from the affected part, came to the conclusion that a depletory effect might be attained in other hyperæmic conditions not of traumatic origin. He therefore employed it in catarrhal inflammations of the mucous membranes of the throat and nose, naturally acting upon them indirectly by applying the effleurage externally to the neck.

His results were corroborative of his deductions. As is natural, he found that this depletory action was not only confined to the mucous membrane, but that the entire territory drained by the vena jugularis communis was thus affected, and that the derivative and depletory action of the effleurage was made noticeable by various phenomena, which could only be attributed to the anæmic state produced in all the organs of the head and neck. Thus he noticed in patients, who before the séance complained of a feeling of pressure in the forehead, and of dulness of the entire head, and whose face was congested, that not only was the external congestion relieved, but the relief of the other symptoms showed that the hyperæmia of the meninges must also have been diminished.

The method of Gerst is executed as follows: "The body of the patient having been exposed to below the shoulders,

the patient is placed in an upright position, the head inclined backwards, and both shoulders allowed to hang downwards. The upright position is chosen in order not to tire the operator as much as would be done were the patient sitting; by bending the head backward, and allowing the shoulders to droop forward, a greater surface of the neck

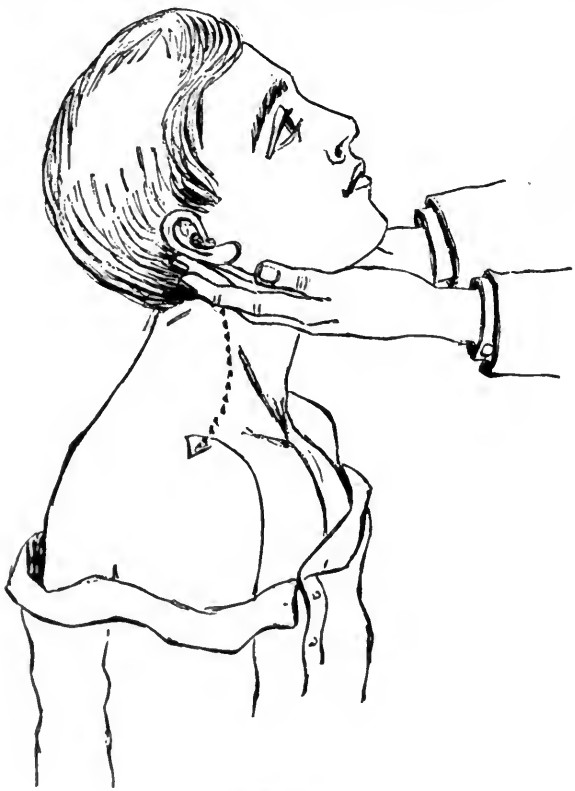


Fig. 5.
MASSAGE OF THE NECK.—GERST.
First Position.

is exposed, and therefore the effect of the procedure increased. Furthermore, the patient is instructed to breathe quietly and regularly. After having oiled the parts, the séance of centripetal strokings is begun. These are performed simultaneously with the right and left hand, upon the right and left side of the neck, in a somewhat accel-

erated tempo, and continued for about ten minutes. Each stroke may be divided into three parts: (1) The two hands, held open with the palm turned upward, are placed with the ulnar edges in the right and left fissure between the head and the neck, in such a way that the end of the small finger and the ungual extremity of the ring-finger lie behind the

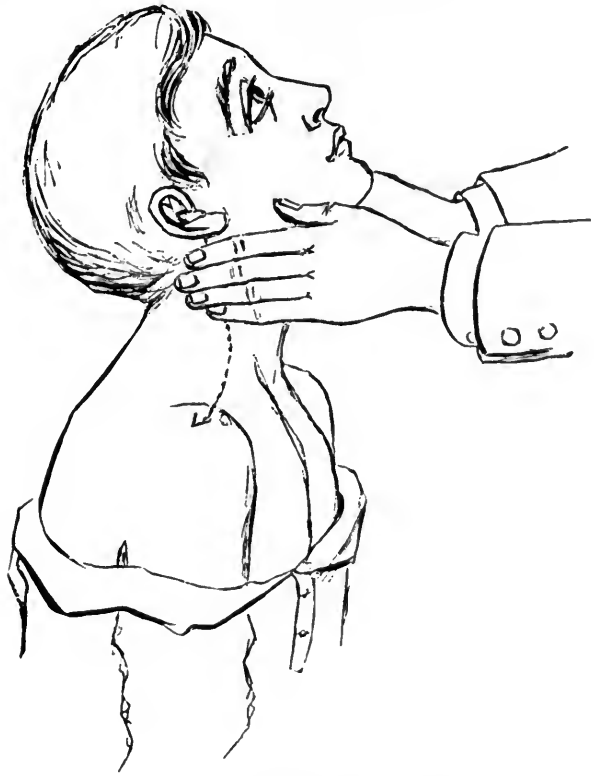


Fig. 6.

MASSAGE OF THE NECK.—GERST.
Second Position.

ear upon the mastoid process, and the ball of the small finger below the horizontal ramus of the inferior maxillary.

With the ulnar edges of the right and left hand thus placed, the centripetal strokings of the upper part of the neck are begun. While the ulnar edge is being moved towards the centre of the neck, both hands are turned upon

their own axes in such a way that the radial edge becomes the uppermost, and being turned towards the head, ultimately touches those parts which in the beginning were occupied by the ulnar edge. By means of this motion, the entire palmar surface of the hand becomes applied to the

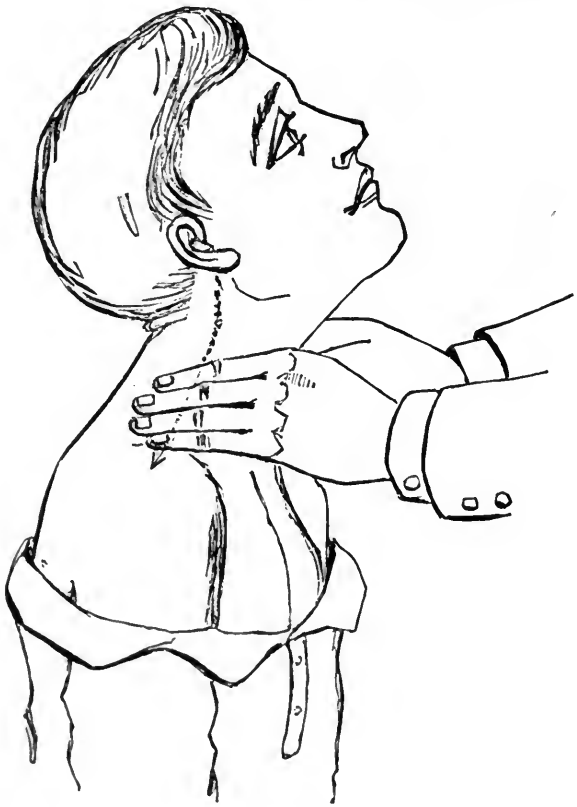


Fig. 7.

MASSAGE OF THE NECK.—GERST.
Third Position.

neck, and is then used for stroking. During this procedure, the operator must pay attention that he executes a continuous pressure with the respective thumbs upon the right and left common jugular veins, and with the rest of the hand upon the superficial veins and lymphatics which take their course in the lateral parts of the neck. Having arrived in

the superior clavicular fossa, the hand is still further turned upon its axis, until the radial edge is used for stroking.

Weiss has described another method of neck-massage which is particularly applicable for children and persons with long, delicate necks. The operator places himself opposite the patient, joins the fingers of his hands behind the cervical spine, and then with the thumbs performs stroking

Fig. 8.
MASSAGE OF THE NECK.—WEISS.
For Children and Persons with Long Delicate Necks.

movements downwards, the movements being first slow and gentle, afterwards faster and more energetic. The thumbs are thus moved from the inferior maxillary downward to the clavicle, stroking partly the region of the common jugular vein and partly the lateral regions of the neck. The clavicles having been reached, the thumbs are lifted and carried back to the starting-point without touching the neck.

Hoeffinger (verbal communication to Dr. Reibmayer) practises neck-massage as follows: The patient sitting upon a chair with a raised seat, the head bent somewhat backward, and the upper part of the chest exposed. The operator, standing behind the patient, places the fingers of both hands in the fissures under the inferior maxillary, both thumbs pointing backwards, and then strokes quickly and with a moderate equable pressure downward and outward.

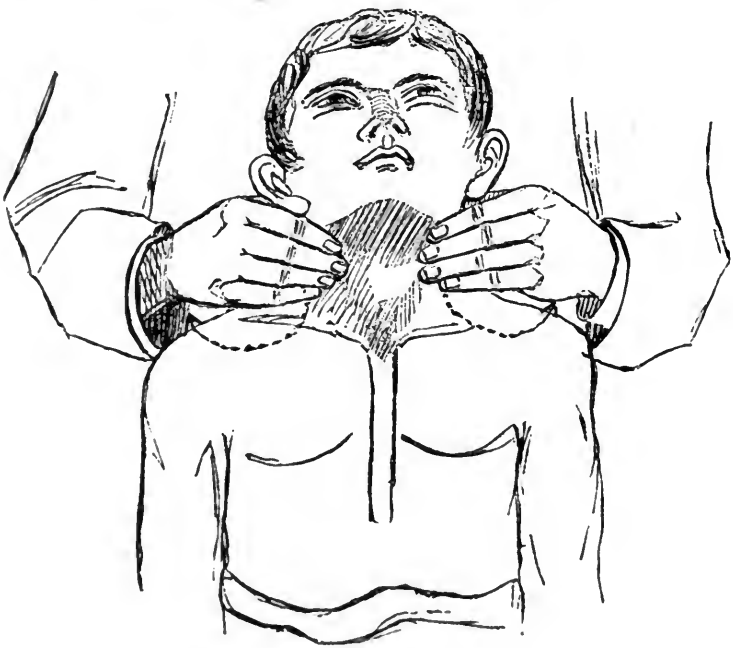


Fig. 9.

MASSAGE OF THE NECK.—HOEFFINGER.

This procedure has the advantage, that pressure upon the larynx is easily avoided, and that the séance is not as fatiguing for either.

After considerable experience with these methods, I am inclined to give the procedure of Gerst the preference. It is certainly more energetic, and a more intense effect can be attained through it, than with any other. Hoeffinger's method is the most convenient and most easily executed.

EFFECT OF SECTIONS OF THE SPINAL CORD UPON THE EXCRETION OF CARBONIC ACID.*

By ISAAC OTT, M.D.

THIS subject, as far as I know, has received but little attention. When the cord has been completely divided, the action upon the pulmonary exhalation has been observed in the course of calorimetric experiments. That the gray and white material of the spinal cord have different functions is self-evident, and it is an important question in what relation they stand to the excretion of carbonic acid. It also bears upon the path of the thermo-inhibitory fibres in the spinal cord. The experiments were made upon rabbits and cats by means of Woroschiloff's instrument. The apparatus of d'Arsonval was heated to 100° F., the rectal temperature of the animal, taken just before he was placed in the chamber. The reason of maintaining the calorimeter at so high a temperature was that I wished to see the effect of a partial section of the cord upon the rectal temperature. If the ambient temperature should be much lower than that of the animal, then so much heat would be dissipated through the vaso-motor paresis that no rise of rectal temperature would be noted. It is well known that after complete section of the spinal cord and heat dissipation being prevented, a rise of temperature will be dependent upon that of the surrounding air, whether it is above or below that of the animal. Thus if the spinal cord of a rabbit be divided about the junction of the dorsal and lumbar regions, the temperature falls, but if the animal is placed

* Read before the American Neurological Association, 1884.

in a medium where the temperature of the air approaches that of the body of the animal, the temperature of the animal rises. This rise of temperature is due to the division of the cord, and not to the external heat. Thus if an uninjured animal is placed in a warm chamber for some hours, no rise of the bodily temperature takes place, but when the cord is divided and the animal placed in the warm chamber, then the temperature rises. If the spinal canal is opened completely, exposing the cord without cutting it, and the animal placed in a warm chamber, the temperature rises only a few tenths of a degree. If, on the following day, the same cord is divided, and the animal placed in a warm chamber, the temperature whilst at first falling rises several degrees. Whilst confinement in an apparatus ordinarily lowers the temperature, it is not believed that a change of it will take place where the temperature of the medium is greater than the air in which the animal usually is, and which nearly approaches that of the animal, unless it is to elevate it, and as the elevation would be the same during the successive entrances to the warm chamber, this error balances itself. The section at the junction of the cervical and dorsal regions reduces to a minimum the effect on the respiration and circulation, and probably can be overlooked in the results. To estimate the carbonic acid, the respiration apparatus of Voit was employed. It aspirated the air from the calorimeter, as it does from the usual glass case. The method of working the apparatus and the estimate of the carbonic acid were according to the plan laid down in the *Zeitschrift für Biologie*, Band xi., Heft 4.

In my several experiments upon partial division of the cord, an increase of the carbonic acid was noted in all except two. It made no difference in the majority of them whether the white or gray matter was divided. In relation to the temperature, it rose slightly above that seen after being an hour in the calorimeter, except in two; in the others it fell below normal. The rise of temperature took place where little beyond the spinal gray was divided. In the two experiments where the decrease of carbonic acid took place, the temperature remained at the same level, or fell, whilst

in all the others the temperature and carbonic-acid excretion were increased. Appended are some of the experiments in detail.

EXP. 1.

Time.	C. T.	R. T.	G. Meter.	1st Meter.	2d Meter.	3d Meter.	4th Meter.
12.55 P.M.	95.2	103¾	398,491	84.22	16.75	5.58	81.24
1.55 "	95.2	104½	403,655	85.37	17.88	6.91	82.53

Rabbit etherized. Section at the eighth dorsal vertebra. Left lateral column protected. Division of the gray matter and part of the right lateral and posterior columns. Confirmed by microscopic examination.

2.36 P.M.	95.2	100½					
3.36 "	96.	102¼	409,278	86.87	19.26	8.43	84.01

1 c. c. $\bar{o}$ = .001 mg. CO_2.

Quantity of Air Examined.	Corrected in Litres.	Determination of Carbonic Acid. Baryta-Water. Vol. in c. c.	c. c. of Oxalic Acid for 20 c. c. Before.	After.	Carbonic Acid in the Air Examined.	Carbonic Acid in a 1,000 Litres.	
1.15	2.875	100	57.7	55.6	.01075	3.739	
		50	19.1	19.0			
1.12	2.800	100	57.7	55.	.01375	4.910	
		50	19.1	19.0			
1.33	3.325	100	19.1	18.0	.00575	1.729	
		50	19.1	19.0			
1.29	3.225	100	19.1	18.0	.00575	1.782—	2.569 per 1,000 litres of expired air of animal.
		50	19.1	19.0			
1.50	3.750	100	57.7	54.5	.01625	4.333	
		50	19.1	19.0			
1.38	3.450	100	57.7	54.0	.01875	5.434	
		50	19.1	19.0			
1.52	3.800	100	19.1	17.5	.00825	2.434	
		50	19.1	19.0			
1.48	3.700	100	19.1	17.9	.00625	1.689—	2.822 per 1,000
		50	19.1	19.0			

EXP. 2.

Time.	C. T.	R. T.	G. Meter.	1st Meter.	2d Meter.	3d Meter.	4th Meter.
12.50 P.M.	100⅘	103⅝	420,596	89.78	21.99	11.41	86.71
1.50 "		105	425,600	91.87	23.14	12.59	87.54

Rabbit. Division of gray matter, posterior columns, and part of left lateral column, divided at eighth dorsal.

2.35 P.M.	101	101	430,533	92.97	24.36	14.08	88.40
3.35 "		102½					

Quantity of Air Examined.	Corrected in Litres.	Determination of Carbonic Acid. Baryta-Water.			Carbonic Acid in the Air Examined.	Carbonic Acid in 1,000 Litres.	
		Vol. in c. c.	c. c. of Oxalic Acid for 20 c. c.				
			Before.	After.			
2.09	5.625	100	57.7	53.6	.02075	3.600	
		50	19.1	19.0			
1.15	2.875	100	57.7	55.9	.00925	3.200	
		50	19.1	19.0			
1.18	2.950	100	19.1	18.6	.00275	0.930	
		50	19.1	19.0			
.83	2.075	100	19.1	19.0	.00075	0.360	2.755 per 1,000
		50	19.1	19.0			
1.10	2.750	100	57.7	54.5	.01625	5.909	
		50	19.1	19.0			
1.22	3.050	100	57.7	56.0	.00875	2.868	
		50	19.1	19.0			
1.49	3.725	100	19.1	18.6	.00275	0.7382	
		50	19.1	19.0			
.86	2.150	100	19.1	19.0	.00075	0.348	3.845 per 1,000
		50	19.1	19.0			

EXP. 3.

Time.	C. T.	R. T.	G. Meter.	1st Meter.	2d Meter.	3d Meter.	4th Meter.
1.45 P.M.	98	102⅘	440,761	92.00	24.36	14.19	88.45
2.45 "	99	105⅘	447,330	93.36	25.86	16.67	89.41

Cat.—Division of both lateral columns and posterior columns at 8" dorsal vertebra.

3.00 P.M. 4.00 "	98	$102\frac{5}{8}$ $105\frac{1}{8}$	452,845	94.77	27.19	17.02	90.38

Quantity of Air Examined.	Corrected in Litres.	Determination of Carbonic Acid. Baryta-Water.			Carbonic Acid in the Air Examined.	Carbonic Acid in 1,000 Litres.	
		Vol. in c. c.	c. c. of Oxalic Acid for 20 c. c.				
			Before.	After.			
1.36	3.400	100	57.7	54.9	.01425	4.191	
		50	19.1	19.0			
1.50	3.750	100	57.7	55.4	.01175	3.133	
		50	19.1	19.0			
2.48	6.200	100	19.1	18.1	.00525	0.846	
		50	19.1	19.0			
.96	2.400	100	19.1	18.6	.00275.	0.114	3.182 per 1,000
		50	19.1	19.0			
1.41	3.525	100	57.7	54.0	.01875	4.310	
		50	19.1	19.0			
1.33	3.325	100	19.1	17.9	.01625	4.887	
		50	19.1	19.0			
.35	875	100	19.1	18.1	.00625	.714	
		50	19.1	19.0			
.97	2.425	100	19.1	18.6	.00325	1.390	3.546 per 1,000
		50	19.1	19.0			

THE "PSYCHO-MOTOR" CENTRES.—A CLINICAL CONTRIBUTION.

By PHILIP ZENNER, A.M., M.D.,

CLINICAL LECTURER ON DISEASES OF THE NERVOUS SYSTEM IN THE MEDICAL COLLEGE OF OHIO.

NOTWITHSTANDING the great progress which has been made in the physiology of the brain in recent years, our knowledge of the functions of the cerebral cortex is still very incomplete.

I wish to refer merely to that part usually termed the motor or psycho-motor centres, the anterior and posterior central convolutions. That these convolutions have a direct relation to voluntary movements is now very generally believed. Experiments on animals, and the observation of the effects of disease in men, leave little room for doubt in this matter. But just what this relationship may be is a different question, and one upon which different views are entertained.

These views, tersely expressed, are that the cortex of the central convolutions possesses strictly motor functions—that is, its cells send out excitations which directly produce the contraction of muscles and result in voluntary acts; that the cortex of the central convolutions possesses certain sensory functions, especially that usually termed muscular sense, which are necessary for the guidance of voluntary acts, and without which the latter cannot be properly performed; that the cortex of the central convolutions possesses both sensory and motor functions, the two residing in different layers of cells in the same part of the cortex.

The first experiments on animals, as well as the first pathological observations, pointed only to motor functions, for electrical excitation of the cortex produced movement

of different members, and the first observations in man were those of so-called cortical epilepsy. But a careful analysis of even the first extirpation experiments led apparently to a different conclusion. Fritsch and Hitzig, in their earliest publication, stated that the final result of destruction of a motor centre was not actual paralysis, but rather ataxia of movement, the motor disturbance being attributed to deficient knowledge of the condition of the member.

Munk has made the most careful analysis of the phenomena attending removal of the motor centres. He found loss of (*a*) the sense of pressure or contact, (*b*) of the knowledge of the position of the limb, (*c*) of the power of voluntary movement, (*d*) and of the sense of touch. The degree and permanency of the loss of function were according to the extent of brain surface which had been removed; the sense of touch being most readily, the sense of pressure least readily affected.

But loss of sensory functions after destruction of the central convolutions has not been found by all experimenters. Ferrier, especially, attributes to those convolutions only motor functions.

Observations of the effects of disease in man have also, as yet, led to no positive results. In a few instances anæsthesia, as well as monoplegia, has been found with a circumscribed lesion of the central convolutions, but in the majority of published reports only paralysis is spoken of. Wernicke believes this to be often due to imperfect observations. The detection of slight sensory disturbances requires a very careful examination, such as is not generally instituted.

The final solution of this question, if solved at all, must be obtained from the study of the results of disease in man.[1] For this purpose new and careful observations are necessary. It is with the hope of contributing something of value in this direction that the following case is here recorded.

[1] One kind of observation which may throw much light upon this question is not mentioned in the text of the paper—that is, the study of secondary degenerations. If degeneration of pyramidal tracts follow a lesion limited to the cortex of the central convolutions, the latter must possess motor functions. Yet it might have also sensory functions, in another, say a more superficial layer of cells. This question of secondary degeneration is still *sub judice*.

A. N., age twenty-three, shoemaker, was wounded during the court-house riot, March 29, 1884. "The wound was on the right side of the head and laid bare the bone, on the surface of which a linear fracture, without any depression, was seen. It was made by a ball which had ploughed through the scalp and just grazed the bone. The wound was four inches long, and about two and a half inches from the median line, and would have been equally divided by a line passing from one auditory meatus over the vertex to the other."

The man was unconscious for some hours after the injury, and there was occasional delirium for a period of two weeks. When consciousness returned it was observed that the left arm was entirely powerless, and that the face was drawn to the right side. No observation of the condition of the lower extremities was made. Shortly after the injury there was loss of sensibility in the hand; a pinch was not felt. From the second or third day, for about a week, there were frequent convulsive movements of short duration, apparently limited to the muscles of the face and unattended by loss of consciousness.

Within a week power of movement at shoulder and elbow had returned, though the hand and wrist were yet powerless. After a few weeks a paresis of the left hand alone remained.

I first saw the patient seven months after the date of the injury. The foregoing statements were obtained partly from the family, partly from Dr. N. P. Dandridge, who saw the patient about a week after the wound had been received. I saw the patient three times the latter part of October, and December the 1st, 1884, and May 16, 1885. As my first examination was a hasty one and no notes were taken, I will give a description from notes of my examination on December 1st.

He is a man of average size, well built, and of good muscular development. On the right side of the head there is a linear cicatrix two and a half inches in length. The direction of the cicatrix is parallel with the sagittal suture, from which it is distant about two and three quarter inches. The central part of the cicatrix, in an antero-posterior direction, is just above the meatus auditorius. Patient does not suffer with headache, or other subjective symptoms, and, in his own opinion and that of his family, his mental powers are unimpaired. There is no impairment of sensation or motion anywhere except in the left upper extremity. He can walk long distances without difficulty, and the face, both in repose and action, shows no motor defect.

Left upper extremity.—Power in the movements at the shoulder and extension of the elbow about equals that of the right side. Can not flex the elbow quite as forcibly as the right, but, perhaps, the difference is not greater than could be accounted for by its being the left arm, and its having been used less than the other for some time. Grasp in left hand fair, but quite appreciably less than in the right. But the difference in the power of the flexors of the fingers is more apparent when he attempts to flex one or sev-

eral fingers separately. Then there is a decided difference in the two hands, the greatest difference being observed in the middle and ring fingers. This difference is also manifested when he holds an object, as a pencil, between his finger-tips. He holds it well with the left hand, but with decidedly less force than with the right.

Cutaneous sensibility is good everywhere, excepting over the fingers. Elsewhere he feels the lightest touch (though in the left palm it is less accurately localized than in the right), but in the last two phalanges, both in their dorsal and palmar surfaces, he only becomes aware that the parts are touched when decided pressure is made. A small piece of coin, whose exact character is immediately recognized by the right hand, is often not felt at all when placed between the fingers of the left hand.

The knowledge of the position of the fingers is impaired. This is most marked in the middle and ring fingers. Occasionally he does not seem to know (eyes being closed) that the finger is moved. At other times he mistakes which finger it is. On the right side his knowledge in this respect is perfect.

Actions requiring some delicacy of movement are performed very awkwardly. He buttons his coat with the left hand with the greatest difficulty.

The only deep reflex action which could be elicited was slight movement in tapping the lower end of the radius. The same reflex could not be elicited in the other side.

A word more as to the improvement of the patient. According to the statement of the family, there was continuous improvement for six months, after which his condition appeared to remain stationary. I first saw him seven months after he sustained his injury. As before stated, my examination at that time was hurried, and no notes were taken ; but my impression is that both the impairment of sensation and muscular weakness were greater than they were at the time of my second examination, some five weeks later. But his condition May 16th (nearly fourteen months after the injury) was in no wise different from what it was December 1, 1884, unless it be that delicate movements, as buttoning his coat, were performed with more ease.

In this case we have no post-mortem examination to reveal the exact location and extent of the lesion. Neither does the external wound inform us just where the brain substance was injured, and especially gives us no information as to the direct cause of that injury, whether depressed fracture of the inner table of the skull, circumscribed hemorrhage, or some other condition. Nevertheless, in my opinion, we have in this instance the direct effects of a distinctly circumscribed lesion of the brain surface. The wound was over the part of the central convolutions considered to

be the motor centre for the upper extremity. It is true that we might easily believe that something more than the motor centre for the arm had been affected; that, supposing the sensory centre of the arm to be in close proximity to the motor centres, both might have been injured at the same time.

But this explanation will scarcely satisfy the conditions here presented. At first there appeared[1] to have been complete loss of sensation and motion in the upper extremity, improvement occurred in both simultaneously and, apparently, equally, and now defects in both directions appear to exactly cover one another. This, it appears to me, can only be explained by the affection of a part wherein reside both motor and sensory functions.[2]

The extent of cortex involved in the lesion can not be very great, as it is quite probable that his mental powers are unimpaired. It is also probable that the injury is almost, if not altogether, limited to the cortex, for there is no evidence of secondary degeneration.

The motor symptoms are like those common to cortical paralyses when only the centre for the upper extremity is affected. The movements of the fingers are affected rather than those of the elbow and the shoulder; and the dexterity, much more than the power of movements, is impaired.

The disturbances in our patient very closely resemble those obtained by Munk experimentally. The sense of contact or pressure is the least, tactile sensation the most, impaired; while the knowledge of the position of the parts, and voluntary control over them, are affected to an intermediate extent.

Immediately after sustaining the injury the patient was unconscious. When consciousness returned paralysis of the face and arm were observed. Doubtless at this time the leg was paralyzed also, although, as patient was confined to his bed, no observation of its condition was made.

[1] I express myself in this guarded manner because my information of his condition at that time is obtained altogether from his mother. But her statements are very clear, and I do not doubt their accuracy.

[2] If this be true, it is quite possible that the different functions reside in different layers of cells of the cortex.

Both the unconsciousness and hemiplegia, in great part, were indirect symptoms, whose occurrence is so well explained by Wernicke, and for that reason passed away in a short time. The spasmodic movements in the face, which occurred at an early period, must have been due to some irritation of its cortical centre.

It is far more difficult to explain the improvement which took place at a later period, for the paralysis which was still present after some months had elapsed must have been a direct symptom. A part of the improvement may have been due to the absorption of effused fluid liberating parts which had been deprived of their functions by mere pressure; but the greater part of the late improvement was probably due to the vicarious functioning of other parts. Munk believes that the cortex in the immediate neighborhood of the destroyed parts assumes the functions of the latter.

Perhaps sensory fibres become united with the cells of other parts of the cortex before they terminate in the central convolutions, in which they receive their final elaboration, and, for that reason, loss of sensation after destruction of the central convolutions may be in part supplied. As to their motor functions, perhaps the central convolutions act chiefly in arousing subcortical motor centres, and, in their absence, some other communication with the subcortical centres is established. Such a theory would, at least, enable us to understand how the loss of the highest centre, possessing both motor and sensory functions, might be in part supplied.

Clinical Cases.

A CONTRIBUTION TO THE STUDY OF LANDRY'S ASCENDING PARALYSIS.*

By LEONARD WEBER, M. D.

Before giving the clinical history of a case of acute ascending paralysis observed by me, it may not be out of place to remember that in 1859 Landry described a few cases of ascending paraplegia, without lesions in the spinal cord, and named this form of paraplegia "paralysie ascendante aigue," and Kussmaul in the same year reported two rapidly fatal cases of spinal paralysis, where the post-mortem appearance of the cord was found to be apparently normal.

The attempt of Petit fils to identify Landry's ascending paralysis with poliomyelitis anterior acuta or subacuta, *i. e.*, to look upon it as a variety of the latter disease, differing in degree only, has been made again quite recently by Prof. Immermann, more in the form of a suggestion, as I shall show later on. But in consideration of more recent facts bearing upon the subject, and particularly of the negative results of autopsies made by Westphal upon some clinically well-observed cases of Landry's paralysis, those attempts of Petit fils and others cannot be called successful. It is perhaps somewhat different with the theory recently put forth by Roger, who believes that many cases of the favorable forms of ascending paralysis are cases of polyneuritis acuta, of infectious or other origin, in which the spinal cord is either not at all or, when so, only secondarily affected.

In *L'Encéphale*, No. 2, 1885, G. H. Roger, published an interesting article, "Les Névrites Périphériques." He discourses on the clinical pictures which are produced by affections of the peripheral nerves, particularly in polyneuritis, with symptoms similar to those of medullar disease. He speaks first of localized neuritis both after trauma and infectious disease, which may produce

* Read before the New York Neurological Society, Nov. 3, 1885.

trophic disturbances and paralysis, without any participation of the spinal cord. In eczema, pemphigus, herpes zoster, etc., the ganglionic bodies may remain intact, or may undergo secondary degeneration when the neuritis moves in a central direction. In cases of simultaneous peripheral and spinal affections, a correct diagnosis is of course difficult, and up to the present, says he, we have paid almost exclusive attention to the central lesions, although the course of the disease has in many cases shown that the lesion ascended from the periphery to the centre. He maintains that many cases of Landry's paralysis, the literature of which he gives in extenso, belong to the peripheral nervous affections, as well as Duchenne's "paralysie générale spinale subaigue," and "paralysie diffuse." Several cases reported by Leyden and Eisenlohr, in which they found, after ascending muscular atrophy and paralysis, the principal lesions in the peripheral nerve branches, Roger claims also as essentially peripheral neuritis.

The usual course of the disease is, according to Roger, the following: A brusque attack of severe pain in the extremities, generally the lower, often considerable fever, soon after paralytic condition, but no contractures; diminished or abolished tendon reflex, cutaneous reflex variable, the paralyzed muscles become rapidly atrophic, and the incipient hyperæsthesia soon gives place to anæsthesia. Pressure over the affected nerves is exquisitely painful, the electric irritability generally diminished, the intellect remains undisturbed. The result is mostly favorable, but complete or partial recovery takes place slowly. When death ensues, it occurs generally by asphyxia, under pseudo-bulbar symptoms. The lesions which may be found in such cases in the spinal cord, or its meninges, are only secondary, though they have often been looked upon as primary. The differential diagnosis between diffuse polyneuritis and diffuse myelitis is often very difficult, according to Roger. The absence of visceral disturbances furnishes the best argument for the assumption of peripheral neuritis.

As to the etiology of polyneuritis, we are still in the dark. Westphal lays much stress upon infection. Roger draws attention to the frequent coincidence of tuberculosis and polyneuritis. I do not know whether Erb has changed his views with regard to this point, but as late as 1879 he said that cases of progressive polyneuritis ought not to be mistaken for acute anterior poliomyelitis by the carefully observing practitioner, for the sharp pains and anæsthesias and paralyses limited to the affected nerves, and the rapid loss of their electric excitability, are sufficient to establish the differential diagnosis. It may be justifiable, according to these recent observations, to speak of two forms of acute ascending paralysis, the well-characterized spinal and less well-known peripheral. Evidently more clinical and anatomical research is required in order to arrive at a satisfactory understanding of the disease.

Paralysis ascendens acuta is clinically characterized by a motory paralysis, which, generally beginning at the lower extremities, af-

fects pretty rapidly the trunk and upper extremities, pretty often, also, the medulla oblongata ; the sensory nerves, bladder, and rectum are but little affected. The paralyzed muscles do not waste much, and do not change or lose their electric excitability. More or less fever may accompany the disorder, which pretty often terminates fatally by asphyxia, etc. At the autopsy no lesions are found in the cord.

Men are taken with Landry's paralysis more frequently than women ; most cases occur between the twentieth and fortieth years, but it has been observed later in life ; of hereditary or neuropathic influences nothing is known. Among the exciting causes : severe cold, acute febrile and infectious diseases, such as typhoid, diphtheria, variola, etc. Suddenly suppressed menses have been noted. Dr. Bablou and others have seen it after "coite dans la station." The influence of syphilis is doubtful. Landry, Hayem, and of late Westphal, Roger, Strümpell, and others, think that infection, of an unknown character as yet, may be the real and determining cause of ascending paralysis. In following the thought of infection, as a cause, the fact is important that in some of the carefully made autopsies changes similar to those in other infectious diseases have been seen in the liver, spleen, lymphatic glands, and intestinal follicles.

The salient features in the symptomatology of ascending paralysis are : In most cases slight fever, pain in the back and limbs, and great weakness, and various paræsthesias as premonitory symptoms, lasting from one or more days to two or three weeks ; paresis of lower limbs, then of the body, then of the upper limbs, disturbance of respiration through paresis of respiratory muscles. No objective signs of sensory paralysis, no ataxia, no atrophy of paralyzed muscles, as in poliomyelitis anterior acuta, though more or less emaciation may take place in the course of time. The electric excitability of the paralyzed muscles and nerves remains perfectly normal, and that is thus far a most important point in distinguishing the disease from central myelitis and poliomyelitis anterior subacuta. Of vaso-motor disturbances, erythema and profuse sweating have been noted, but no trophic cutaneous changes. Bed-sores have not occurred in a single case. In the majority of cases the tendon reflex is present in the beginning of the disease, but becomes diminished and abolished later on ; but it does not disappear so rapidly and completely as in poliomyelitis anterior acuta. The reports about the cutaneous reflexes vary considerably. Although the bowels are frequently constipated, and there may be occasional retention of urine, bladder and rectum are generally normal, and are never paralyzed, as in central myelitis.

The cerebral functions remain intact, also the cerebral nerves ; only the motor nerves in direct connection with the medulla oblongata may be affected sooner or later.

The paralysis progresses farther upwards in most cases, involving the medulla oblongata, and death occurs under the symptoms of bulbar paralysis. A fatal termination has been seen in

some cases within two or three days, and others again may have lasted two, three, or four weeks before they died. The average duration of the fatal cases seems to be from eight to twelve days. The cases which recover show a change for the better, generally within a few days of the duration of the severe symptoms. The improvement begins in the parts last affected, and progresses slowly, and many weeks may elapse before complete recovery ensues.

An opposite course of the paralysis, *i. e.*, descending from the upper part of the spinal cord, appears to be rare. In Ziemssen's Encyclopædia, edition of 1879, Erb says it must be considered doubtful as yet. My own case is such a one, and deserves to be placed on record for this, if for no other reason.

Some cases of poliomyelitis anterior subacuta may look exactly like Landry's paralysis for a while, and it may not be until the development of atrophy and the loss of electric reaction that we can establish the diagnosis of anatomical lesions of the spinal cord. Immermann's case, of which I shall speak hereafter, furnishes a striking example of the difficulty. A well-marked case of poliomyelitis anterior acuta is not progressive, does not attack the medulla oblongata, nor lead directly to a fatal termination ; the loss of faradic excitability and the muscular atrophy develop rapidly, and on these grounds mistakes in diagnosis might, therefore, be easily avoided. A doubt may arise in very mild cases. Again, in acute central and infectious myelitis we always have fever, severe sensory disturbances, early loss of all reflexes, sphincter paralysis, diminished electric excitability, bed-sores, and rapidly fatal termination.

There are certain forms of spinal syphilis which may present the clinical picture of acute ascending paralysis, and can be distinguished only by the patient's history and the positive results of specific treatment.

The prognosis of anterior ascending paralysis is always serious, and whether a case will terminate favorably or otherwise we can hardly say before some improvement has taken place.

In the treatment of this disease the antiphlogistic apparatus has been brought into action, with rather doubtful effects. Better results have been seen from the use of the wet pack, or warm baths with cold affusions, *i. e.*, procedures for stimulation of cutaneous action. Of remedies, good effects have been observed after giving the iodide of potassium and ergot. The application of a galvanic current of moderate strength upon the entire length of the spine is recommended by no less an authority than Erb. Good nutrition and careful stimulation of the patient are a matter of course.

On December 20, 1880, I was called to see Jacob H., living at College Point, L. I., æt. thirty-one, married, of apparently good constitution and average health, with no hereditary taint. He denies syphilis, and shows no lesions pointing to it. In his early life he often suffered from intermittent fever. At the age of twenty-one he began work in a barometer factory, and, as time went on, grew weak,

and had occasional slight fever and frequent vertigo, but no salivation or other symptoms of mercurial poisoning. He quit this work when he was 25, being compelled to do so by the continuation and increase of the above symptoms. He then lived in the country out West for four years, and returned to his home in good health at the age of twenty-nine.

About three weeks before I saw him, and as he was delivering meat to his customers in his open cart, on a wet and chilly morning, his horse ran away with him, and he had to put forth all his strength in trying to control his powerful animal. As he brought him to a stop he received no concussion nor other apparent injuries, but had a sick and tired feeling all the afternoon, and was hardly able to tend his shop. The day after he was about his place with difficulty, and on the third day he felt generally somewhat ill, had slight fever, and after some days of paræsthetic feelings, such as numbness, tingling, etc., creeping up from the fingers, he gradually lost the use of both arms. Two weeks later, and after similar paræsthesias of numbness, etc., etc., from the toes upwards, the legs became also paraplegic. No signs of paresis of sphincter muscles were noticed at that nor any subsequent time. His stools were retarded. The intercostal and other muscles of the trunk remained intact, nor had he any symptoms involving the medulla oblongata, but he felt some pain along the spine, and continued to have some pain and numbness here and there in his extremities. Up to the time of my visit the case had not been examined with any great care, but treated on general principles. I found the patient still unable to do more than slightly move his limbs while in bed ; he could neither stand nor walk, and had not the power to grasp or hold any object with firmness. Cutaneous sensation appeared to be normal, but the patellar and Achilles tendon reflexes were absent. The limbs were not wasted, and the muscles responded to the electrical current. Pulse and temperature normal ; urine also normal. The slight improvement in the patient's paralytic condition, noticeable to himself at the beginning of the fourth week, had not progressed any further.

Poliomyelitis, or ascending myelitis, could be excluded after this examination, and the case was diagnosed as one of Landry's ascending paralysis. A systematic course of galvanic treatment, massage, and warm baths appeared to be indicated to help the patient toward recovery. But it was impossible to carry this out at his home, and I had him, therefore, admitted to Roosevelt Hospital, where the late Dr. Evetzky became interested in the case. He agreed with me as to the great probability of its being a case of Landry's paralysis, with a comparatively good prognosis. He devoted a good deal of time and care to the man while at the hospital, treating him for over thirty days as above indicated. He was discharged cured, and was soon able to attend to his business again. I then lost sight of the patient, but had him looked up quite recently. He came to my office October 30th, of this year. He looked well enough, walked briskly and firmly, and said that

he was well able to attend to his business, but required a good deal of sleep, more so than five or six years ago. No lancinating pains, but occasional backaches; bowels somwhat constipated; urine 1,015, no abnormal ingredients; patellar tendon reflex totally absent on both sides; ability to stand on one foot with eyes closed not good; pupils quite normal; no sensory disturbances, no paræsthesias.

In the *Neurol. Centralbl.*, No. 9, 1885, Dr. Sorgenfrey reports a case of Landry's paralysis occurring in a robust man fifty-seven years of age, a week after getting his back wet in a cold drenching rain. After paralysis of all four extremities had developed, severe dyspnœa from paresis of respiratory muscles, and bulbar symptoms came on, and the patient was expected to die. However, as a *dernier ressort*, extract of ergot, gr. 1 every hour, was administered, until twenty grains had been taken, when the dangerous bulbar symptoms disappeared. The patient soon began to move his limbs again, and eventually recovered without any further medication. In the same number of the same journal, Dr. H. Mieth also reports a case of Landry's paralysis in a working man, aet. forty-two, whose recovery was greatly facilitated, he says, by the daily application of a mild descending current along the spine.

I bring a short notice of these two recent cases before you, because in them, as well as in those of Westphal and one of Hunnius and my own case, the early abolition of patellar and Achilles tendon reflex has been observed, the reappearance of which did not take place until after the complete recovery of the patient. It has not returned at all in my own patient. The vesical and rectal functions, cutaneous sensibility, and muscular electric excitability were found, and continued to be, normal in all these cases.

Prof. Immermann, in a paper read before this year's convention of German neurologists on poliomyelitis anterior acuta and Landry's paralysis, gave the history of a male patient, æt. twenty-two, who gradually developed paralysis of the upper and lower extremities of the abdominal muscles and bladder, while the sensory nerves remained intact. Immermann looked upon the case as one of ascending paralysis, but finding also that the patient had lost his tendon reflex, he for a while inclined more to the diagnosis of polyomyelitis anterior acuta. However, the electric reaction remaining normal, the bulbar symptoms disappearing, and the paralysis of the upper and lower extremities improving, and no muscular atrophy taking place, he returned to his former diagnosis of Landry's paralysis. The patient died of intercurrent pneumonia, and the autopsy showed recent inflammation in the anterior horns of the cervical, dorsal, and lumbar regions of the spinal cord. In concluding his remarks he throws out the suggestion that both clinical pictures may be due to one morbid process, the same in principle, but differing in degree.

EXTRACTS FROM RECENT ITALIAN NEUROLOGICAL LITERATURE.

By GRACE PECKHAM, M.D.

Clinical History and Autopsy of a Man who Presented the Phenomenon of Walking Backwards. By Dr. Luigi Mazzotti. *Rivista Clinica*, June, 1885.

The patient was sixty-six years old, an Italian, a hard drinker, who entered the hospital for a scorbutic eruption May 18, 1883. His condition slowly but surely improved. By the first of July he was sufficiently recovered to attempt to leave his bed to walk. The attendants reported that the man, instead of going forward, walked backward.

When he rose to his feet to attempt to walk, he looked at the floor, spread his legs as one who has fears of losing his balance and of falling, Sustained by the arm and so held as not to influence him in any direction, he was asked to walk. He replied that he was unable to do so, but when commanded in a resolute tone he attempted to advance forward, but instead of doing so, he went backward, exercising with the limb a force as if overcoming an obstacle. After having gone a short distance in this manner, the body arched over backwards, then turned from right to left, and would have certainly fallen if he had not been sustained. Raising him, the same experiment was repeated with like results, when he was returned to bed, as he appeared to be suffering very much.

Upon inquiring into his history, it was found the patient had passed easily through the usual maladies of infancy, and at twenty-one years had malarial fever of the quotidian type, which occurred again at twenty-six, lasting two months, and was of the tertiary form. When thirty-one he had facial erysipelas. For about five months, at the age of fifty-five, he had a somewhat serious illness. He had fever, pain in the head and neck, and a general sense of weakness. After this attack he never had perfect health, and suffered from time to time from lack of strength, from swelling and pain in his feet, which were worse in winter. He continued at his work till one day in December, 1882, when he suddenly lost consciousness and fell ; but he quickly recovered himself, and

was able to go to his house with some one to support him by the arm.

He was relieved of the sense of weight in his head by the application of leeches, and after remaining a week in bed, was able to go about. The giddiness in his head was not such as to cause him to fall. His strength diminished, and in the last two months his limbs swelled and became so painful he was obliged to remain continually in bed. His intelligence seemed unimpaired; but his moral character changed. While at home he never gave any sign of walking backward.

As to the family history, his parents lived to a good old age, and of his two sons, one died of scurvy (?), the other still lives in good health. He was a great drinker, and was often exposed to the direct rays of the sun.

May 18th, he entered the hospital, brought thither in a carriage, and reached the bed supported by the arm. The son who accompanied him thought he bent himself somewhat over backwards.

Examination after he entered the hospital showed him to be a man well formed, of robust appearance and good height, cheerful disposition, responded intelligently. Special senses preserved, though a little weak. Tactile sensibility normal, but not exquisite. Sensibility to pain a little exaggerated. Voluntary movements prompt and regular, reflex movements and tendon reflex a trifle exaggerated; more pronounced upon the right than the left.

Physical examination of thorax and abdomen revealed no signs of alteration. Urine normal. Pulse, 72; respiration, 26; temperature, 36.9° C.

From time to time, when attempting to walk, he presented the same phenomena. August 31st, when he had been sitting in an arm-chair for half an hour, his head fell forward, he lost consciousness, became cyanotic and cold, his pulse almost imperceptible. Placed in a horizontal position in bed, he quickly returned to his usual state. It was the last time he was able to sit up. He had great abdominal pain, numerous diarrhœal evacuations, fever and delirium increasing at night. He lost strength and appetite, and died September 2d, at 8 A.M.

At the autopsy performed September 3d, little was found that was abnormal, except a slight degree of lepto-meningitis of the convexity and an atheromatous condition of the arteries at the base of the brain.

These cases of pronounced movements, forwards or backwards, more especially the latter, are rare. In general reasoning from clinical and physiological data, they would indicate a lesion in some part of the encephalon, especially of the pons, peduncles, of the corpora quadrigemina, of the cerebellum, and of the medulla oblongata. The writer thinks that possibly the condition of the arteries at the base of the brain might have occasioned a disorder of the circulation, which might be the cause of the phenomenon of going backward, if it were not for the fact that there are many

cases in which were atheromatous arteries in the encephalon in the same state, without the slightest indication of this strange symptom. The conclusion is therefore reached, that, as a clinical phenomenon, going backward is of no value as a diagnostic sign of a localized cerebral lesion.

Clinical Contributions to the Localization of the Olfactory Centre. Thesis by Dr. Emilio Carbonieri. *Rivista Clinica*, September, 1885.

The writer of this paper adds another to the few cases in which an autopsy goes far toward proving the location of the cerebral centre for the sense of smell. The patient, at the age of twenty-seven, was admitted to the Medical Clinic at Modena, in March, 1884, suffering from a peritonitis with exudation. Suddenly, at the end of April, at which time he felt almost completely recovered, there arose new symptoms. Once or twice during the day he was seized with a feeling of melancholy, general malaise, obscuration of all his senses, and observed a very nauseating odor. After two or three minutes all passed away. After a time these attacks were accompanied by supra-orbital and occipital cephalalgia, with pain in cervical region and formication in the left half of the body, and then vomiting. The attacks averaged one a day; and, when less in frequence, were of greater duration—that is, prolonged a half hour or more. Later, the increase was even greater, commencing, in the evening, with heaviness and weight in the head, which increased during the night, when he could not sleep. In the morning, the cephalalgia was very great, accompanied by the usual formication and feeling of weight in all the left side of the body; the most nauseating odor and copious vomiting of a liquid, greenish-yellow in color, and of very bitter taste. In the intervals of the attack the patient was able to go on with his work.

In December he had an attack resembling convulsions, though he did not lose consciousness completely. After this, he had diplopia for several days.

In February of the present year he was admitted to the hospital again, suffering with tubercular peritonitis, from which he died April 18th. The autopsy revealed the dura mater closely adherent, pia mater opaque. On the under surface of the brain, the portion below and anterior to the right temporo-sphenoidal lobe, just at the left of the fissure of Sylvius, was a body hard, well-defined, of a light-yellowish color, and rounded up and more elevated than the lobe of the other side, of the size of a walnut, which proved to be a tumor of tubercular nature. It was 27 mm. long, by 22 mm. wide. The tumor was shown, on microscopic examination, to be tubercular. It was found in the convolution of the occipito-temporalis externa, and of the convolution of the hippocampus, was encapsulated in the cerebral substance, in which it was buried. About the fissure of the occipito-temporalis interna and the convolution of the hippocampus, the cortical

substance was noticeably thinned, and where the tumor was the most prominent, the thickness was reduced to 1½–2 mm. There was diminution of the consistence and a softened and œdematous condition, and the lateral ventricles contained a small amount of serous fluid.

There were found miliary tubercles in the apex of the right lung, with recent adhesions and miliary tubercles in the whole of the left lung. Heart pale and flaccid ; liver and spleen enlarged ; adhesions ; caseous and enlarged mesenteric glands ; small miliary nodules, were found in the abdomen, as well as a cavity to which communicated the left inguinal canal, which was filled with a fetid ichorous fluid. The walls of the cavity were gangrenous and degenerated. Near to it was a caseous mass adherent to the parietal and vesical peritoneum.

After a review of the literature of the subject, showing that pathologists and physiologists point to the gyrus hippocampus as the cerebral seat of the sensation of smell, the writer considers that his case confirms this opinion, although he is not able to exclude the influence of the tumor on the adjacent parts ; nevertheless he thinks that the fleeting olfactory hallucinations were due to the irritation of the gray substance of the gyrus hippocampus.

Infantile Paraplegia Occurring only in the Act of Walking. Case reported by Serafino Romei. *Gazetta degli Ospitali*, Settembre 23, 1885.

This very curious and rare phenomenon occurred in a young boy aged eleven. He had always been well, parents healthy. After a fright in July , 1882, he suffered with severe headache, which kept him in bed four days, when it was cured. Upon attempting to arise and put his feet to the floor he suffered intense pain, and was unable to walk. In September, 1883, when the writer saw him, he was suffering from pain in the articulations of the left foot and swelling. In April, 1884, he commenced to go about a little bent, and with evident trouble in ascending stairs. Little by little he lost the power of his limbs and had to be supported like a man exceedingly drunk. His case was then diagnosticated as one of rheumatism, and he was ordered thermo-mineral baths and was relieved of the pain as by magic at the fourth bath.

Tactile and thermic sensibility unaltered, as well as sensibility to pain. Sensibility and muscular power of the two lower extremities normal. General condition perfect, with the exception of pain and tenderness upon pressure over lumbar vertebra. All the movements of flexion and extension of the lower extremities performed, separately and together, with energy and precision. Tendon reflex normal ; when the patient was raised to his feet to attempt to walk, it was necessary to support him ; he was as a child taking his first steps, there was lack of power and coördination in the movements of walking. When in bed the patient was a vigorous youth, able to coördinate all the movements of the lower extremities ; on his feet he was a pitiable paraplegic. The writer excludes

organic lesions, effect of imagination—that is, psychical and mental causes, common hysteria and chorea, and ordinary infantile paralysis or reflex or rachitic paralysis. He resorts to the following hypothesis, which he himself acknowledges as frail, namely : a depresssion of the coördinating centre of the function of the muscles which maintain the body in an erect position and enter into the act of walking.

The strangest part of this clinical history is the rapid restoration of the patient after a dose of nux vomica. He immediately arose and went to the house of the physician to thank him for his healing. The people cried a miracle. The physician regarded it as a case of mental impression.

This peculiar and interesting clinical history offers material for speculation, which we will leave to the reader. We only wish to point out its contrasting similarity to those cases of saltatory spasm in which the victims jump from the floor as soon as their feet touch it—an explosion of nerve force; while this shows the reverse—an absence of nerve force brought about by a like condition.

The Thickness of the Cerebral Cortex in Man. A. Conti. (*Giornale della Regia Academia di Medicina di Torino*, 1884.) *Lo Sperimentale*, June, 1885.

The measurements have been made anew to determine the thickness of the cerebral cortex in different parts of the brain, with reference to age and sex and to the gray substance of the ganglia. The researches have been made on fresh brains well preserved, carefully weighed, and every precaution taken to avoid error. From the result of the observations made on twenty brains, eleven men and nine women, were deduced the following conclusions :

1. That the thickness of the gray substance of the brain diminished with the increase of the age in each portion of the cerebral cortex.

2. That in the same section this thickness varied in the external surface, the internal and inferior of the hemisphere.

3. The thickness of the cortex is greater on the internal surface in youth, and on the external surface in the adult and old.

4. The thickness of the cortex which limits the fissure of Rolando is greatest at the anterior portion, least at the posterior.

5. The maximum thickness is about the fissure of Rolando and exactly at the apex and at the division of the ascending frontal convolution.

6. The cerebral cortex has a minimum thickness at the depth of the fissure.

While these observations are of great interest, it is to be regretted that a wider number of them had not been made before the above conclusions were deduced.

The Color-Sense in the Syphilitic. S. Ottolenghi and A. Conti. Quoted in *Lo Sperimentale*, June, 1885.

Examination was made of 310 patients in the dispensary and wards of a Turin hospital, and the following conclusions were reached:

That true discromatopsia is not more frequent in the syphilitic than in others; that after syphilis the retina, optic nerve, and cerebral centre for the perception of color are often affected; the disturbance is functional, and should not be confounded with true congenital discromatopsia.

That although the proportion of cases of color-blindness found in constitutional syphilis those in the tertiary period would be relatively greater than those in the secondary, nevertheless they were unable to believe in a true discromatopsia or acquired blindness to color following syphilis.

The Slow Bulbar Pulse. By Rusconi. *Gazetta degli Ospitali*, April 15, 1885.

The pulse which falls below sixty beats per minute ceases to be physiological. Some writers maintain that the number of individuals whose pulse is below sixty and even fifty is greater than is generally believed.

Napoleon I., for example, had a pulse of forty-five per minute.

The slowing of the pulse is observed in many convalescing from typhoid fever, acute articular rheumatism, small-pox, etc. Blot has called attention to the slowing of the pulse in the puerperal state. The pulse is also slowed in acute meningitis, when cerebral tumors are present, in cerebral excitation, and during epileptiform and fainting attacks. Examples are not wanting to show the lowering of the pulse to a limit which seemed incompatible with existence. Rotureau saw a pulse descend to sixteen, Teissier and Boyce to fourteen, Tripier to twelve, Portal to ten. This slowing of the pulse was accompanied by slight dyspnœa and fall of temperature.

In various cases of slow pulse, auscultation of the heart gave contradictory results; sometimes negative, very frequently fatty infiltration of the heart muscle. Lasègue found a light systolic murmur at the apex; Teissier and Cornil a doubling of the second sound, as also Bondet and Bardum. Cases, too, are on record where there have been two beats of the heart to one of the radial pulsation. The tracing of the pulse has shown an abortive pulsation. Tripier thinks that the greater number of cases of slow pulses depend upon an intermittance of heart's beat or an abortive pulsation. Many cases are recorded of slow pulses which have become a physiological habit. They are unaltered by change of position of the body or by elevation of temperature. Girin observed in a sick person that the pulse fell, on account of a moral cause, to 30.

In general, those who have a slow pulse suffer from attacks of vertigo, cloudiness of the brain, syncope, epileptic convulsions without aura. At the moment of the crisis the pulse falls even more; Boyce has seen it wanting for fifteen seconds. Sometimes

the slowing of the pulse is more marked ; sometimes the crisis hastens it. Many of the patients have observed this obscuration of the brain when leaning forward, or upon kneeling. The loss of consciousness is preceded always with nausea, sometimes followed with vomiting. During these attacks the face becomes cyanotic or very pale ; the pupils dilate. Clonic movements, more or less violent, are present during the epileptoid attacks ; prostration succeeds and coma. The patient is very weak when he comes to himself.

Longnet is of opinion that the slowing of the pulse, with the phenomena already described, is due to alterations of the bulb, especially in the zone of the origin of the pneumogastric. The pathological anatomy supports this localization.

Lepine reports a case where the basilar process was buried into and had compressed the right half of the protuberance and the bulb. A certain number of cases are noted where there has been traumatism of the spinal column in the upper cervical region, which has given rise to slowing of the pulse, together with other symptoms. Another case is given—that of Alberton : A man was thrown from a horse, at which time his head was violently flexed upon the sternum. Two years after the fall he had attacks of syncope, recurring more and more frequently, at which time his pulse would become reduced to 20, 15, 12, 9, 8 pulsations. Three or four times Alberton observed in his patient, when he was fully conscious and without any disturbance of fainting, a pulse as low as 7 and 5 pulsations per minute. The man died suddenly while dining. At the autopsy a stenosis of occipital foramen was found in the antero-posterior diameter, caused by the displacement of the odontoid process, which had been thrust backward and upward from its normal level. Stocker records the case of a patient with pulse slowed to 28 per minute, who suffered from epileptiform and fainting attacks. At the autopsy an aortic dilatation was found compressing the trunk of the pneumogastric. The slowed pulse of angina pectoris is also of peripheric origin.

The duration of the disease is ordinarily long ; the prognosis is grave ; death occurs suddenly, sometimes following a kind of cachexia without peculiar lesion.

Society Reports.

NEW YORK NEUROLOGICAL SOCIETY.

Stated Meeting, October 6, 1885.

The President, W. R. BIRDSALL, in the chair.

The minutes of the previous meeting were read by the Secretary and approved.

The report of the Council was read, and on motion was adopted.

Drs. M. A. Starr, I. Adler, J. B. Emerson, R. M. Cramer, and R. G. Wiener, were recommended for membership.

The Secretary was instructed to cast an affirmative ballot for all the candidates. The Secretary so cast the ballot, and the President declared the gentlemen elected to membership.

Dr. E. C. SEGUIN then read a paper, entitled "A Contribution to the Pathology of Hemianopsia of Central Origin." Case with specimen. (This paper will appear in full in the next number of this JOURNAL.)

Discussion.

Dr. T. R. POOLEY.—Mr. President: Without knowing at all the direction which Dr. Seguin's paper would take, I hastily looked over my records this evening, and briefly abstracted five cases of hemianopsia, of which I have notes. One of these cases is the case referred to by Dr. Seguin in his paper. I feel myself quite incompetent to discuss the physiological and theoretical question as to the location of the lesion, and the importance of different symptoms in helping us to exactly locate the lesion in the brain. Nor will I at this late hour refer to all the cases of which I had

intended to relate somewhat in detail the clinical histories. I shall content myself with speaking only of one case, which has recently come under my observation, and which is now under treatment. It is a case which I saw a week ago, that of a gentleman, aged thirty-five, who came under my care in 1879 for comparative blindness of his left eye, which I found to be due to circumscribed choroidal exudation, situated near the macula lutea. In my former experience with such cases I always believed them to be due to syphilitic infection, and careful inquiry into the history of this case showed it to be also due to this poison. The patient remained for a time under treatment for this inflammatory exudation, from which he recovered with a scotoma, and enjoyed comparatively good health and freedom from all further syphilitic manifestations until a week ago, when he consulted me again.

On this occasion he was driving with his wife in the country, and suddenly became perfectly blind. This blindness lasted for but a few moments. Upon recovering he ascertained that there was dimness of vision upon the left side, which continued until he came to see me. Examination showed left homonymous hemianopsia, the blind area extending almost to the point of fixation in each eye. Examination of acuteness of vision showed in the left eye (and this is interesting because of the previous condition of the eye), $\frac{22}{100}$; the right eye, $\frac{20}{20}$, or perfect. The optic discs were quite normal, the blood-vessels were of full size. There was no indication of atrophy of the optic nerve by neuritis. The interesting and remarkable fact in this case is the improvement which took place within a week from the commencement of treatment. On account of the previous history of the case the patient was placed upon large doses of iodide of potassium. Former experience with the use of this drug, however, led me at first to give comparatively small doses, only fifteen grains. But I found that he tolerated large doses much better than he did small ones, and I immediately began pushing the remedy, so that I gave him one drachm three times a day by the third day. Already upon the first day after treatment had been begun, the

visual fields had increased in extent, and this increase in the visual field has steadily continued until the present date. Unfortunately I have not had opportunity to make measurements with the perimeter, the patient being treated at his home, but I may estimate that the field of vision has extended from near the point of fixation to one third the normal limits, the increase being apparently symmetrical. I should like very much to have Dr. Seguin's opinion as to whether, in a case of this kind, in which there has been such marked improvement within a week's time, we may hope for permanent benefit.

Dr. A. M. STARR.—At this late hour I will not detain the Society but a moment. I think the list Dr. Seguin has presented is a complete one, with perhaps a single exception—that of a case reported by Demange in the *Révue de Médecine* for May, 1883. That case is referred to by Dr. Gowers, in his last work on "Diseases of the Brain," in a way to lead one to suppose that it supported the assertion of Ferrier, that the angular gyrus is the centre for vision. I found, however, on looking up the case, that the lesion was one which coincided very largely with that of the first case of Westphal, and is very well represented by the diagram shown by Dr. Seguin of that case. It was a very large lesion, involving both parietal lobules and the occipital lobe. Gowers refers to that case as proving that a lesion upon one side of the brain may produce blindness of the opposite eye, and says it supports Ferrier's assertion of amblyopia being due to lesion of one angular gyrus. In the original report, however, it is only stated that the patient could not see well with the left eye, and it does not state that there had been any careful measurement of the field of vision. Therefore, in all probability, the patient had hemianopsia, as in a number of cases reported by Dr Seguin, and in a number which I collected, lack of careful observation on the part of the examining physician failed to elicit the symptom, which was undoubtedly present. The necessity for careful examination in all of these cases has been dwelt upon by Dr. Seguin, and I think it ought to be emphasized, because it is evident, from the history of these

cases, that a patient with hemianopsia does not notice the exact field of vision, but only notices that he is blind in one eye, and refers it to the eye whose field of vision is most largely implicated. The necessity for such an examination is shown in the fact that Dr. Seguin has been able to collect eight cases in addition to those which I had collected—that is to say, eight new cases have occurred since January, 1884. This great increase in the number of cases of hemianopsia is only apparent, few cases not having been recorded previously because of imperfect examinations of the visual field.

I would not anticipate Dr. Seguin in answering the question asked by Dr. Pooley, but I have in my hand a case, published by Baer, in Volkmann's *Sammlung klinisher Vorträge*, which is almost identical with that related by Dr. Pooley this evening: a case of syphilitic hemianopsia coming on suddenly in a syphilitic individual. A series of diagrams are given, showing the progressive improvement of the patient, and final complete recovery.

My attention was first called to this subject three years ago, by seeing a case of hemianopsia in Charcot's wards, and in his lecture Charcot virtually retracted his own diagram and adopted one like that shown by Dr. Seguin, so that I think we should cease to copy the old diagram made by Charcot, as it has been abandoned in France and Germany.

The absolute necessity for such a collection of cases as Dr. Seguin has made for settling any disputed question of localization is perfectly evident to you all. It is the only way in which this question of localization can be really determined. To make conclusions from physiological experiments I think is no longer warranted. We must go to carefully made autopsies.

It may be interesting to know, that in October, 1858, the Pathological Society of Philadelphia discussed the subject of abscess of the brain, and at that meeting Dr. Weir-Mitchell presented a case with the records, in which a large abscess, at the posterior part of the brain, involving both occipital lobes, was attended with blindness, and the blind-

ness seemed to be the chief local symptom (as we should now say) of the disease. The members of the Pathological Society were at a loss to explain the occurrence of blindness with this lesion in the occipital lobes. I think it is encouraging to the general cause of clinical diagnosis that now, after the lapse of these years, we are able to explain perfectly that case which then so puzzled the Pathological Society of Philadelphia.

Dr. SEGUIN closed the discussion, and apologized for having detained the Society with so long a paper. With reference to Dr. Pooley's question, he would have to decline to answer it for want of experience. He had never seen a case of hemianopsia which was not embolic, or, possibly, due to a tumor, and in which there was no indication for treatment.

Stated Meeting, November 3, 1885.

The President, W. R. BIRDSALL, M.D., in the chair.

Dr. LEONARD WEBER read a paper, entitled "A Case of Ophthalmoplegia Externa."

Peter W., æt. fifty-two, father of a number of apparently healthy children, has worked in an iron foundry for the last thirty-two years. His mother died of pulmonary hemorrhage at sixty-four years of age; his father died at fifty-three, of typhoid fever. Has a brother and sister living in good health. He has never had syphilis. Fourteen years ago he was under treatment for hæmoptysis, accompanied by fever and other signs of acute lung trouble. But he recovered in the course of a year or so, and has been able to continue his work since. Nevertheless, the signs of old pulmonary trouble are well marked in the interscapular space, particularly on the right side. In the course of years the patient sustained various injuries about the head, but no fracture of the skull. At no time did his condition give any evidence of renal or cardiac disease. Since February 1, 1885, he experienced considerable and lasting pain at the back of the head, on the right side. In getting out of bed on the morning of February 23d, of the present year, he felt somewhat dizzy, and noticed a pain in the right temporal, extending to the occipital, region. He also found that he could not use his eyes as on the night before. He continued to work, however, and on March 9, 1885, consulted Dr. Mittendorf, who reports that the use of the patient's right eye was lost early in childhood. The left eye gave him no trouble until recently. On March 9th, both eyes were found to have turned considerably

toward the nose. Neither eye can be moved in the direction of the external rectus. The pupils slightly contracted. Accommodation good. Treatment: Hypermetropia necessitating use of strong glass for left eye to make reading possible. Vision of right eye, which has a corneal macula, very poor. Acuity of vision of the left eye (not fairly tested, patient presenting himself at night), about $\frac{2}{3}\frac{0}{0}$. Marked hyperæmia of left disc. Interior of eyes normal. Paralysis extending to third nerve, but was not complete. Patient would move his eyes downward considerably at times, but he seemed to have lost control over the movements of the muscles, and if directed to look in a certain direction he could not do it. On March 17th, he first noticed seme numbness and a cold feeling, from the fingers up to the middle of the arm, on the right side. While this sensation was unpleasant, it in no way interfered with his work of using a heavy hammer. But about April 15th the arm became weak. At the same time, co-ordinate muscular action became impaired. He was unable to direct blows with precision, often striking an inch to either side of the object. He soon had to quit work.

He consulted me on May 14th. At that time the eyeballs were almost immovably fixed. Nevertheless, there was complete paralysis of the external recti only. The levatorespal pebrarum were not affected, neither were the muscles of the iris. The right hand was colder than the left. Sense of touch diminished, actual muscular power also. Visible trembling and gradual dropping of wrist when the extremity is extended horizontally, showing weakness of extensors. Slight exaggeration of patellar tendon reflex on right side.

The patient's speech was not very articulate: some dysarthria existed already. There was no dysphagia, and no symptom indicating disturbance of cerebral nerves other than of the fifth pair. The gait was unsteady, resembling that described by Nothnagel in connection with certain cerebellar affections. The lesion producing the above symptoms I am inclined to locate in the pons. As to its nature, it is probably a neoplasm of syphilitic or tubercular origin.

The patient was ordered iodide of potassium in doses beginning with ten grains three times a day, which was increased by five grains every week. In this way the dose was carried up to forty grains three times a day. From June on a noticeable improvement began, and by September 2d, his speech had become almost normal. The power of his right arm was much increased. There was no more headache. The eyes had largely recovered their mobility.

On October 30th it was observed that the eyes could be freely moved, although some paresis of the external recti still remained. The patient was then taking forty-five grains of the iodide three times a day. Some spitting of blood now occurring, the remedy was discontinued for two weeks, and then resumed with an initial dose of twenty grains.

I believe the anatomical lesion to be situated in the left half of the pons, near the tegmentum, involving the lemniscus, and extending beyond the raphé, some little distance into the right half of it.

Discussion.

Dr. W. M. MITTENDORF said the author of the paper was to be congratulated on the result of the treatment in this interesting case. As stated in the paper, when the patient visited him there was this paralysis of the external recti, and he thought there was also a slight defect of the facial nerve, and he was inclined to place the lesion in the upper part of the fourth ventricle. But as motor-oculi paralysis developed, he came to the conclusion that there was a more extensive lesion than he had at first supposed. An interesting feature in the case was the fact that, while there was ophthalmoplegia externa, there was at no time, while the patient was under his care, any affection of the intrinsic muscles; and this fact, according to recent investigations, would point to a lesion below the aqueduct of Sylvius. The cases of ophthalmoplegia externa without other symptoms were very few. He had now under his care a young man with ophthalmoplegia, affecting both eyes, in whom there had been no change for two years. The lesion, he supposed, was to be placed in the region of the corpora quadrigemina. At one time he thought there were real ataxic symptoms, but he was unable to make out a clear case of locomotor ataxia.

Dr. T. R. POOLEY thought the fact that the patient struck to the outer side of the body, which had been attributed by the author to paresis, might have been caused by faulty projection depending upon paresis of the external rectus muscle. He had never seen a case of complete paralysis of the ocular muscles with so satisfactory results.

Dr. WEBER remarked that at first there was no tendency to strike outward. In reply to a question by Dr. Spitzka, he said there had been no wasting of the muscles, although the general nutrition of the patient had not been at all times equally good.

The President had reported two cases to the American

Neurological Society, which in some respects resembled this case, but in some other respects there were important differences. He reported them as cases of ophthalmoplegia externa, according to Hutchison's nomenclature, and they were, strictly speaking, cases of this sort. The ciliary muscle and the iris were not involved at any time, while the external muscles of both eyes were involved to a greater or less degree. No other nerve tract in the body could be found defective. The two cases had remained about in the same condition, with slight improvement for two years. It seemed to him, however, that the cases which Hutchison had reported under the name ophthalmoplegia externa did not all belong to that class, for in only two or three were the external muscles of the eye alone affected. Most of his cases were of a complex character. It seemed to him that the pathology of these cases must vary greatly. The lesion would probably be found to vary not only in location, but also in character. His cases he thought were due to a slow degenerative form of disease, similar to that in progressive muscular atrophy. Certainly some of Hutchison's cases were of a multiple character, and probably in many others the lesions were multiple.

Dr. E. C. SPITZKA spoke substantially as follows: I have been much pleased to find a doubtful point in the past history of this case cleared up by Dr. Pooley's discovery of a residual paresis of the other rectus externus. It adds, however, to the difficulties of localization, though not incompatible with the diagnosis of Dr. Weber. With regard to Dr. Pooley's suggestion, that the loss of skilled motion on the right side is due to the eye trouble, that possibility had already been taken into account, and disposed of for the following reasons: First, the motor disturbance was not present when the eye trouble was at its height, nor present when the latter began. I believe that ophthalmologists will agree that locomotor trouble is apt to be proportionate to the intensity of the eye complaint, and, if any thing, to be regulated provided the eye trouble remains stationary or improves. In this instance, however, we have the eye trouble at its maximum without arm trouble,

and arm trouble developing as the eye trouble improves, and manifested when the eyes are closed. Besides, we must bear in mind that, as the patient has not had the use of his right eye from childhood, he would not be as likely to be disturbed in his movements as patients with monocular vision would be.

I believe the oculo-motor disturbance can be best accounted for by a regional extension of lesion in that part of the tegmentum which lies between the trochlearis and abducens nuclei, and where certain coördinating tracts run. I shall have an opportunity perhaps of demonstrating specimens of a case in which but one special conjugate movement of the eyes was interfered with, and there was a neoplasm in and near the abducens level, chiefly unilateral.

Dr. WEBER asked Dr. Mittendorf whether there were not for a time symptons of hemianopsia.

Dr. MITTENDORF said there was no lesion of the retina or nerve when he examined the patient.

Dr. M. A. STARR asked whether there had been any ptosis.

Dr. WEBER replied in the negative.

DR. STARR thought that a lesion lying outside of the cerebral axis, as a syphilitic meningitis, affecting the abducens nerves at their exit between the medulla and pons, might explain the symptoms more intelligibly than to suppose a lesion in the floor of the fourth ventricle affecting the nuclei themselves. Of course such a lesion would yield to syphilitic treatment, whereas he could not conceive of a nerve nucleus being destroyed and again restored. If the third nerve were involved, we might suppose the meningitis had extended a little farther forward. He had the privilege of seeing a case in Bamberger's wards at Vienna three years ago, in which the third, the fourth, the sixth, the seventh, and the eighth nerves upon one side were paralyzed, and Bamberger made the diagnosis of lesion at the floor of the fourth ventricle, involving the nerve nuclei from above downward, especially so as there were signs of atrophy in the facial muscles. The autopsy showed localized meningitis affecting these nerve trunks after their exit from the cerebral axis.

Dr. WEBER again mentioned the symptoms present, and said that so far as the oculo-motorius was concerned, there certainly was an affection of the superior and inferior recti.

Dr. E. C. SEGUIN had not been convinced from seeing the patient this evening that there were any ataxic symptoms in the right upper extremity. The dropping of the fingers might indicate either weakness of the extensors or the loss of a certain amount of muscular sense, which might be due to a lesion situated in many places besides the pons. He was inclined to Dr. Starr's view. The discussion seemed to indicate the vanity of theoretical pathology.

Dr. SPITZKA.—In my crude way I had always regarded muscular-sense disturbance as a factor of ataxia, and I believe authorities generally would so consider it.

Dr. SEGUIN.—Erb recently described a case in which there was ataxia, but all categories of sensation were perfect.

Dr. SPITZKA.—That has nothing to do with the question. Ataxia is of different kinds—cerebellar, spinal,—due to ordinary contact, to muscle sense, space sense, and coördinatory disturbances; sometimes singly, sometimes combined. But muscular-sense disturbance is mentioned in the definitions of ataxia by our best authorities, and I should like Dr. Seguin or any one to formulate a general definition of ataxia which should declare muscular-sense disturbance not to be a factor. It is precisely because there is muscular-sense disturbance that I believe the lesion to be pontile. The interolivary layer happens to run in the deep part of the pons, in those levels where the cranial-nerve symptoms of this case are possible. I have shown, if any one case be conclusive, that this layer is the muscular-sense tract, and the case agrees with others of its kind. There is a combination of slight paresis with the muscular-sense disturbance which is almost characteristic of certain pons diseases, it requiring but an extension of the lesion across the deep transverse pons fibres to involve the pyramidal-tract bundles. With regard to the suggestion of a meningitis, it does not seem to me to harmonize either theoretically or with experience. It is true that the affection of both abducens nerves might be accounted for in this way. But there

are other symptoms which the supposed lesion must accommodate. How to account for the arms symptoms on this ground I do not know. There are too many important nerves near the hypoglossal, whose function is intact, to account for the dysarthria on the ground of meningitis. Besides, there is no true paresis of the hypoglossal. Its intrinsic movements are well executed, and there is no evidence either of nuclear or peripheral hypoglossal palsy; in other words, it is some higher tract—the speech tract—that is involved. We know that this runs somewhere in the pons, near the raphé, whereby another nerve (the fifth) is affected in its decussation, thus accounting for the bilateral disturbance of face sensation. But the strongest objection to the meningitis theory is that it would have us believe it possible that the third pair can be diseased so totally in its extracerebral course—or intracerebral for that matter—as to cause total paralysis of ocular motion, without any affection of the pupil, the accommodation, or the levator palpebræ. I have never heard of such a case, and do not think there is one reported, and do not believe such possible. If there were no other reason for suspecting pons disease, it would, in my opinion, be constituted by the character of the ocular paralysis. But in addition we have the almost pathognomic combination of paresis and ataxia. True, Dr. Seguin calls it muscular-sense disturbance, which it is undoubtedly—with this difference in interpretation and definition: that he says it is not ataxia, and I consider it to be such.

Dr. STARR thought that the abducens nuclei could not be involved, together with the interolivary layer, without affecting the formatio reticularis, which ought to show sensory symptoms if affected.

Dr. SPITZKA.—The difficulty seems to be that Dr. Starr has only one particular level of the pons in mind, one not necessarily involved in this case, inasmuch as the nuclei of the abducentes, but coördinating tracts are supposed to be at fault. Even allowing the lesion to be in the level spoken of by Dr. Starr, the difficulty he discovers does not seem to me to be as he states it. That no symptoms referable to the formatio reticularis are present, can constitute no

objection, as long as the function of that part which lies between the raphé and the abducens roots is unknown. The abducens roots, however, skirt and partly perforate the interolivary layer, and so far it is possible to have coincident abducens and muscular-sense disturbance; the real difficulty in this case would be to account for the double involvement of the abducens, without the bilateral involvement of the interolivary layer. As I understood Dr. Weber when he presented the case to me, he supposed the lesion to lie in the anterior third of the pons with a dorsomesal, and possibly caudal, extension to near the ventricular floor. Here the altitude of the tegmentum is extremely low, a comparatively small lesion may involve the interolivary division of the lemniscus—I mean its continuation, the raphé, with its trigeminal decussation, the posterior longitudinal fasciculi, the pyramidal tract slightly, and the speech, either after Raymond and Artaud or the other theories. The advantage of this explanation over the others offered is, that it requires the smallest lesion to harmonize with the symptoms, while grave objections can be urged against every other location, particularly the one which would locate the lesion as a meningitis involving peripheral nerves. I must reiterate, that till the inconsistencies of the oculo-motor paralysis are explained away, insuperable obstacles oppose the meningitis theory. Possibly Dr. Weber's reference to the voluntary control of single ocular muscles might lead to misapprehension. No ocular muscle is capable of isolated movement under voluntary effort. But groups of such are. There is a ready-made coördinated mechanism of which the posterior fasciculus is probably the important mediator, which regulates the coördination of both globes, and it is here where the trouble lies.

Dr. WEBER then read a paper entitled "A Contribution to the Study of Landry's Ascending Paralysis." See this number, p. 442.

Discussion.

Dr. E. C. SEGUIN had not seen a case of Landry's disease, but he had always had a strong suspicion that there was a great similarity if not identity between that disease and poliomyelitis acuta. The mere matter of

ascension did not seem to him to be of so great importance in the diagnosis. The views which, when a pupil, he had heard Brown-Séquard frequently express with regard to ascension of spinal symptoms had always seemed to him very reasonable. They were that ascension of symptoms might be apparent when they did not represent any ascending lesion in the cord; they were due to a change in the depth of the lesion in the cord. Suppose theoretically a case of paralysis of the arms, with later paralysis of the legs; it is not at all necessary to suppose a descending lesion in order to explain the descending symptoms; a change in the depth of a lesion which extends but a little ways up and down the cord will account for the descent of the symptoms. In the same way we could account for ascending symptoms without supposing an ascending lesion in the cord. Many authors laid stress upon the value of negative symptoms in the diagnosis of Landry's paralysis, such as absence of degenerative reaction and muscular atrophy; but it was equally true that in many cases of poliomyelitis these symptoms were retarded. He regarded Immermann's case as instructive, in as much as it showed the similarity if not the identity of the two diseases; the difference might be in exact location or in the virulence of the affection.

Dr. SACHS thought that it would be well if more attention were paid to the character of the pathological processes underlying Landry's disease and poliomyelitis, in addition to the question of the exact localization of the respective lesion. While the question of infectious origin had not been demonstrated in either acute myelitis or Landry's disease, Dr. Sachs thought it deserved investigation.

Dr. WEBER closed the discussion, reviewing the differential diagnosis between Landry's paralysis and poliomyelitis anterior acuta.

Stated Meeting, December 1, 1885.

The President, W. R. BIRDSALL, M.D., in the chair.

Dr. WILLIAM A. HAMMOND read a paper on "Unilatera Hallucinations."

The fact that hallucinations of sight and of hearing might be unilateral—that is, discerned by one visual or auditory centre only, had long been known, though it had not, even at this day, attracted the degree of attention which Dr. Hammond thought it deserved. Several authors had considered the matter from a more or less philosophical standpoint, and had brought forward interesting cases in support of their views. The first reference to the fact that hullucinations might be one-sided which had come under his notice, was made by Calmeil, it being a case of hallucinations coming from the left ear. Baillarger cited two cases of hallucinations of hearing occurring in but one ear. Other writers who had contributed to the subject, and cited by Dr. Hammond, were, Schroeder Van Der Kolk, Alexander Robertson, E. Regis, Dumont Pallier. Erroneous impressions, of different character, occurring on either side, had received attention at the Medical Congress at Rouen, in 1883.

Dr. Hammond then gave the histories of several cases of unilateral hallucinations which had come under his own observation.

CASE 1.—The first was that of a gentleman in good general health, who contracted the illusion that the ticking of a clock on the mantlepiece consisted of articulate words. After a time it sounded like human speech, and appeared to give commands, such as not to eat of soup, not to drink wine, etc. It was learned that these illusions came only through the left ear and never through the right, but hearing in other respects was not the least impaired in either ear. The patient did not allow himself to be deceived into the idea of accepting these commands as realities, yet he was influenced by them in his actions. This case and the one next mentioned were referred to in Dr. Hammond's work on insanity.

CASE 2.—A young lady, of good mental development, but of delicate physical organization, was for several months almost constantly troubled with apparitions of various kinds of faces. A few weeks before they first appeared she had looked at engravings of Greek and Roman masks, which had made a strong impression upon her. If she closed either eye about half of the faces would disappear, and if she closed both eyes all would disappear, but would return again in a little while, although less distinctly. By imitating the experiment of Sir David Brewster, pressing on the outside of the globe of either eye so as to produce temporary strabismus, the patient could make any face appear double which had been visible for several minutes. There was no impairment of

vision of any other kind, and no abnormal ophthalmoscopical appearances. The peculiar features of the case were, that the hallucinating images were divided between the two eyes, part being seen in the one and part in the other, showing, therefore, the distinctness and divisibility of the action of the two visual centres, and the fact that the stimulus of a strong light was necessary in order that they should be developed.

CASE 3.—A young man received a blow just above the left ear. A few weeks subsequently, while engaged as a salesman, he saw a large black cat sitting on the floor immediately before him. He had no doubt of the reality of the occurrence until he walked toward the animal, when it receded as far as it was when he first saw it. After this the cat seemed to follow him wherever he went, but his sense of touch was never deceived. The image was larger and most distinct in the evening, and during the paroxysms of pain at the seat of the injury on the head, which returned several times a day. He discovered, on shutting the eyes alternately, that the vision occurred only on the side corresponding to the injury. There were no abnormal ophthalmoscopical appearances nor defects of vision other than those mentioned. That there was serious brain lesion, involving, probably, the left optic thalamus, Dr. Hammond said he had no doubt. He had also been of opinion that there had been fracture of the inner table of the skull at the point at which the blow had been received, and he proposed trephining, which was not consented to.

CASE 4.—A lady about fifty years of age became the subject of most malignant persecutions through anonymous letters, the sender of which she did not know. While thinking of who the person could be that sent the anonymous letters she happened to look out of the bay window and saw a man and woman standing in the opening. For a moment she did not doubt the reality of the appearance, but when she arose they gradually faded from view. Afterward they reappeared several times in the month, and finally ceased to appear altogether. The interesting feature of the case was that the man was always seen with the right eye and the woman with the left; if she closed the right eye she saw only the woman, but if she closed the left eye she would see only the man. The vision could be brought on by lying down with the head low. Dr. Hammond thought nothing could be more confirmatory of the idea of the independent action of the two visual centres than such hallucinations; indeed he thought they were strong evidence of the duality of the brain. None of the cases which Dr. Hammond had cited went to support the view that unilateral hallucinations were due to disease or derangement of the organ of special sense involved. Indeed, it was difficult to conceive what connection could exist between disease of the eyes or ears and a hallucination existing in the corresponding side, for if such disease caused a unilateral hallucination we should expect bilateral hallucinations to be the result of disease of both eyes or ears. Dr. Hammond

thought hallucinations were produced by disease or disorder of the central organ of perception, probably of the optic thalamus, and that such erroneous sensorial impressions when limited to one side were evidence that the visual, auditory, or other sensorial centre of the corresponding side was the starting-point.

Discussion on Dr. Hammond's Paper.

Dr. LEONARD WEBER related a case which he thought would interest Dr. Hammond as going to support the view which he seemed to entertain, that unilateral hallucinations were not associated with disease of the special sense concerned, but with an affection of central origin. The man came under his observation in 1879, at which time he was thirty-seven years of age, strong, healthy, very active in business, but in consequence of domestic trouble and mental strain he began to lose sleep, was sensitive to strong light, loud noises, etc., and from 1879 to 1881 was subject to hallucinations connected with the left ear. On going to bed he would be unable to sleep for two or three hours because of whispering noises, growing louder and louder, heard in the left ear, and of two kinds, one soothing and another demandatory, A careful examination by himself and by a specialist in diseases of the ear failed to reveal any thing wrong connected with the auditory apparatus. When the patient's circumstances changed, and he was enabled to lead a peaceful life, the hallucinations disappeared, and had not returned.

Dr. E. C. SPITZKA had not heard the entire paper, but being familiar with the author's views regarding the function of the optic thalamus, he was somewhat surprised that he (the author) had not tried to harmonize his observed facts with the anatomical and physiological facts which had been incontestably established during the past decade. Luys, upon whom Dr. Hammond probably rested chiefly for support of his views, expressed his ideas regarding the functions of the optic thalamus as many as twenty-five years ago, and what he wrote was mere guess-work. Dr. Spitzka said his own views regarding hallucinations were directly opposed to those of Dr. Hammond. He believed that hallucinations had their seat in the cortex, and not in

the optic thalamus or any of the lower ganglia. The optic tract and thalamus might have undergone secondary atrophy, following enucleation of both eyeballs, yet the person would be capable of having hallucinations, showing that hallucinations had not their seat in the optic thalamus. The case cited by Dr. Hammond, in which, during her hallucinations, the patient saw the figure of a man and woman, showed the exercise of mental qualities which could have their seat nowhere else than in the cerebral cortex. Dr. Hammond had asked whether he did not believe a hallucination to be something which had been previously registered in the memory and which was projected outward. He would reply that, without quibbling with terms, that was precisely what he meant by a hallucination.

Dr. M. A. STARR related the facts in a case reported by Vetter, in which a patient having right hemianopsia, imagined that she saw people sitting at her right side, which was the blind field of vision. By a process of exclusion it was shown that the lesion could not have existed in the optic thalamus, but must have existed in the cortex of the occipital lobe. Dr. Starr thought that in all probability the source of the hallucination in this case was cortical irritation. Certainly in a great many cases cortical irritation would produce hallucinations; this was observable in meningitis, in which the optic thalamus was not implicated.

Dr. W. M. LESZYNSKY recalled the case of a woman in an insane asylum, fifty years of age, suffering from mania, who was in the habit of sitting hours at a time with the left ear inclined toward the table, sending, she said, and receiving telegraphic communications. She did not receive the telegraphic communications with the right ear, which she said was only for general use. Acuteness of hearing seemed to be normal, perhaps that in the left ear was a little more acute than that in the right ear.

Dr. SACHS referred to a case of hemiplegia with tumors in both optic thalami and one lenticular nucleus, reported by Meynert, and stated the inferences to be be drawn from this case as regards the true function of the optic thalamus. Dr. Sachs also asked Dr. Spitzka whether he could imagine

an excitation of the cerebral cortex, giving rise to an image or hallucination, the revival of such image not being due to an antecedent peripheral irritation.

Dr. L. J. CORNING asked, since hallucinations might be produced by impressions upon peripheral nerves, why they might not also be produced by an irritation at any point in that peripheral tract, as in the thalamus. We would all admit that the higher forms of conception took place in the cerebral cortex.

Dr. C. L. DANA would like to hear the subject discussed which Dr. Hammond probably wished to bring before the Society, namely, the duality of the brain. So far as the mechanism of hallucinations was concerned, he thought all would agree with Dr. Spitzka, that it was essentially in the cerebral cortex. But the exciting cause might be a peripheral irritation acting upon the psychopathic centres.

As to the duality of the brain, he thought there were many more arguments against the proposition than for it; but the subject was one of great reach, and could hardly be discussed at this hour. The cause of hallucination did not, it seemed to him, prove much, because only a small part of the psychical mechanism was involved. On the other hand, the experiments of Dumont Paré proved little, because hypnotized subjects could be led to do almost any thing by slight suggestion. But pathological observations, the results of hemi-atrophies, of tumors on one side of the brain, studies regarding language, etc., all went to show that the two cerebral hemispheres had certain distinct functions, and that there were not two halves of the brain each having about the same function.

Dr. CHARLES HEITZMANN said that although he was not a specialist in this department, he had given considerable study to it, and he had received the impression that neurologists were not entirely clear in their ideas concerning the seat of irritation which caused hallucinations. Let the physiological fact be remembered that an impression upon our senses can be brought forward at any time in the shape of a protracted sensation or hallucination. Thus a peculiar sound might be heard which was merely the image of a

real sound, and constituted an hallucination. Every thing which we have learned is deposited in the brain, especially in the gray substance. In the case of the black cat, could the man have had an hallucination of a black cat if he had never seen a black cat? I doubt it. Wherever the centre for the image of the black cat may be, if any portion of the nerve tract leading from the retina to that centre be disturbed, it will be likely to excite that centre, and the image of the black cat will be revived. The special point of interest connected with the cases related was that they were unilateral. He asked if that might not be explained on the supposition that the irritation being upon one side led to the centre for the given image upon that side only.

Dr. SPITZKA said with regard to the duality of mind, that there could be little difference of opinion regarding the following facts: First, that the two cerebral hemispheres were alike in structure, the variations being no greater than in other symmetrical organs, if allowance be made for a higher type of development; the two hemispheres were united by a symmetrical commissure; they had corresponding peripheral tracts; they had about the same distribution of retinal fields; post-mortem examinations on the insane went to prove that the hemispheres were symmetrical; one hemisphere might be practically destroyed, and yet the individual retain power to exercise the several faculties of the mind, as reasoning, memory, judgment, etc., not, however, that there would be no paralysis or other symptoms. But it was a different matter entirely when it was suggested that unilateral hallucinations could exist when the corresponding hemisphere was perfectly healthy.

Dr. HAMMOND, in closing the discussion, said it was not his object in reading the paper to discuss specially the function of the optic thalamus. He might say, however, that he believed a person could have hallucinations without an optic thalamus at all, provided he had a cortex; but he believed also that he could have hallucinations without any cortex, provided he had an optic thalamus. In the former case the hallucinations would be due to revival of past impressions; in the latter case they would be original, having nothing to

do with former associations. A man without an optic thalamus could have an idea of a cat in the abstract, but he could not have an hallucination of a particular cat unless he had an optic thalamus. He believed that ideation resided in the cortex. With regard to the duality of the mind, many arguments might be brought forward, but time would not permit.

The Society adjourned.

CHICAGO MEDICAL SOCIETY.

Dr. J. G. KIERNAN read the following paper on the "County Provision for the Insane."

"We live in an age when every uttered sentiment of charity toward the insane is applauded to its remotest echo; an age in which the chains and locks and bars and dungeon cells and flagellations and manifold tortures of the less humane and less enlightened past are justly abhorrent; an age which measures its magnificent philanthropy by millions bestowed without stint upon monumental mansions for the indwelling of the most pitiable and afflicted of the children of men; an age when he who strikes a needless shackle from human form or heart, or removes a cause of human torture, physical or psychical, is regarded as a greater moral hero than he who, by storm or strategy of war, takes a resisting fortress; an age when the Chiarrugis, Pinels, Conollys, and Tukes, of not remotely past history, and the Florence Nightingales and Dorothea Dixes of our own time are enshrined in the hearts of a philanthropic world with monumental memory."—*Dr. Chas. H. Hughes.*

Bright as is the picture here portrayed, its bright tints are more than equalled by the shadows which come into bold relief when the present problem is studied. The insane in the majority of county institutions continue in a state only paralleled by the condition of the insane in hospitals before the days of Pinel and Chiarrugi. This may seem an extremely invidious declaration to make, but its truth is demonstrable by the perusal of official documents of most of the States.

In Illinois, for example, a State second to none in its humanitarian aims, which takes a prominent rank when provision for the insane is mentioned, the State Board of Charities writes as follows:

"The objection to the care of the insane by counties is that county boards will not ordinarily furnish upon the county farm,

or even in county lunatic asylums, the necessary attendants and medical care. * * * It is not at all an uncommon occurrence for a county board to let the care of the paupers on the county farm to the lowest bidder. Even where an almshouse-keeper is selected on account of his supposed qualifications for the position because he is an efficient farmer and a kind-hearted man, and his wife is a stirring housekeeper, it does not follow that either he or his wife have any special qualifications for the care of the insane. The presence of such patients on the farm is felt by them to be a perpetual annoyance and peril, and they rid themselves of the bother of it in the easiest possible way by shutting up every lunatic, male or female, who gives them the slightest annoyance, and leaving him there without recreation, companionship, or employment. He is fed through a hole in the door or the wall. Sometimes he has a bed and sometimes he sleeps upon straw. Sometimes the room he occupies is warmed in winter and sometimes not. He strips himself of clothing; daubs the wall with filth; for amusement he resorts to the vilest practices, and thus he vegetates until he rots. This, of course, is a description of what occurs in extreme cases. The condition of the insane and of idiots in these establishments is deplorable. Kindly treated by some keepers, by others they are regarded and treated as if they were animals, not men—indeed, not so well as animals capable of earning money for their owners. They are neglected, abused, confined with chains, and not a soul has for them a kindly word. The medical supervision of them is totally inadequate; they have no proper personal attendance; they are without amusement or occupation of any sort. Some of them are taken out at long intervals for an airing or to be washed, possibly by standing naked in a corner and throwing water upon them with a hose pipe. Others remain in their cells or dens from one year's end to the other."

Nor do they fail to support these assertions by facts. For example:

Adams County—The man spoken of as under restraint wears a chain. * * * The female insane pauper who put out her own eyes occupies a large wooden box filled with straw. Her roommate, also blind and insane, sleeps in the same box. They are both filthy in their habits, and neither of them wears any clothing.

Brown—An insane man is very filthy in his habits, and is kept at night in an outhouse, where he sleeps on straw in a box on the floor. The straw is not renewed as often as it should be.

Champaign—The condition of the insane department is very bad. The rooms are filthy and the beds and bedding ragged and filthy.

De Witt—An insane man wears a ball and chain.

Fulton—The insane department is entirely unfit for use. An insane man who is in a nude condition all the time and is rarely,

if ever, taken from his cell, and an insane woman, also nude most of the time, and both very filthy in their habits, are exposed to the gaze of every inmate on the farm who chooses to look at them. The sexes are not separated.

Hancock—A large number of the insane, however, are imprisoned in their rooms from one week's end to another.

Kankakee—Some of the insane go naked at times.

Lake—The insane locked in their cells are much to be pitied. Four of these cells were found to be very filthy. One insane man is very violent. His entire costume is a shirt and a pair of handcuffs. The handcuffs were bright; the shirt was not.

Mercer—One woman * * * is locked in a cell as dark as a dungeon.

Moultrie—An insane woman occupies a pen in a corner of the room.

Peoria—The grounds surrounding the building are neatly kept, and there is a profusion of flowers. * * * Three insane men are confined in cages in the basement. These cages are in very bad order, and the odor from them is very offensive. * * * The inmates are naked most of the time.

Cook County, there are very strong reasons for believing, passed through the phases here depicted in regard to its provision for the insane. The buildings recently removed to make room for the new asylum showed by their construction that pens, cages, and dungeons formed part of Cook County's treatment for its insane in earlier days. Its later history in no respect is more shining than its earlier, only now the veneer is put on the rottenness which no one in times past cared to conceal. The Cook County institutions are under a political machine, and have been so ever since Chicago assumed metropolitan proportions.

The evils of such political control have been too frequently demonstrated to need recapitulation here, and these evils have been very forcibly brought to the attention of at least one Chicago medical society, within the memory of physicians who have resided here for more than a decade. In the year 1875, Dr. J. S. Jewell, then and now one of Chicago's leading neurologists, read a paper before a Chicago medical society entitled "The Insane Poor." Roused by its revelations concerning the county insane hospital, the society appointed a committee to investigate the matter. This committee, of whose work Dr. Jewell did the lion's share, reported that the food supply was far below par; that

iron handcuffs were in use; that the warden, a mere politician, was the official superior of the physicians; that the institution exceeded in cost of maintenance any other public hospital for the insane. A subsequent report by the grand jury stated that all the subordinate officials were directly under control of a warden, subject to his will and authority, who had no experience in the management of the insane, but was well informed in political circles in the selection of his help.

Stimulated by these reports, a newspaper made an independent investigation and found that the Committee on Charities, after making a superficial examination on its periodical visits, indulged in orgies with the liquor furnished for the use of the patients; that on holidays a general drunk was indulged in by the employés with few exceptions, and the "institution was transformed into a low saloon, frequented by a host of bummers"; that on certain nights a dance was gotten up, purporting to be for the exclusive benefit of the patients but in reality for the employés, who were loud-mouthed, incapable men and women, indulging in undue familiarities with each other.

I might close here by saying that all this might be said, with some modifications, of the Cook County Hospital for the Insane to-day, but this would not accomplish the object which I have in view, which is to secure an effective means of preventing such abuses in future.

Before proceeding to discuss the more modern history of Cook County's provision for its insane, I shall cite the fundamental principles laid down by Conolly, the founder of the modern treatment of the insane, that the source of all evil is lack of proper supervision of the insane. Up to the year 1883 there was but little known of the condition of the insane, when, by the efforts of Dr. S. V. Clevenger, then special pathologist, and of the Chicago Women's Club, a lady physician—Dr. Delia E. Howe—was appointed. This lady, now assistant physician at Kankakee, writes concerning the condition of the hospital during 1883–84 as follows:

> From the first I was struck by the lack of system, or organization, that prevailed. No histories of cases by the physician in

charge were kept, no census, and very meagre records of any description. Visits of the superintendent to the wards were few and hasty. In each ward were kept a bottle of whiskey and a bottle of strong sleeping mixture of bromides and chloral, which the attendants dealt out at their own discretion.

Many times on being called to a patient I received this history of the case: "I gave her a drink of whiskey and then a dose of sleeping medicine, but she did not get any better, so I called you."

It took some time to impress the idea that I preferred to be called before the ever-ready remedies were used.

Evidently a physician had been a luxury, and only called as a last resort. I have known of attendants hiring patients to work for them by giving them whiskey and sleeping medicine, which they (the patients) had come to crave as opium-eaters their opium. The amount of this sleeping mixture used in the female wards alone was enormous; as was also the whiskey. It is safe to say the amount used in the female wards alone, with less than three hundred patients, was at times more than is used in the entire institution of fourteen hundred patients at Kankakee, and the noise at the latter institution is much less than at the Cook County asylum.

That the attendants, both male and female, helped themselves quite largely from the ward whiskey bottle, which was filled whenever they desired, is beyond doubt.

The real needs of the patients seemed to call for no thought. They had no bath-towels, and attendants were in the habit of putting the clothing on to the patient without first drying the skin. The wards were frequently cold, and the patients had no winter clothing; and many who would have been greatly benefited by out-door air and exercise did not leave the ward once for more than six months, because there were no wraps. When patients were transported to Kankakee hospital wraps had to be borrowed for them from the infirmary or poorhouse, and even then they suffered greatly from cold in the transfer. Patients from no other county have come to Kankakee so poorly provided for. No system was adopted in regard to clothing, and no account taken of what patients brought to the hospital or what was provided for them there. The bedding was always insufficient.

Restraint was used under Dr. Spray at the discretion of the attendant, and I have seen a patient jacketed, unable to use her hands, and set on the floor to eat her food from a tin platter like a dog. The food is almost beyond description. Where in our State hospitals will you find deaths by the score from scurvy? Where but at the Cook County Insane Asylum will you see two patients fiercely fighting for a small potato, which is given only as a Sunday luxury? Where else will you find the hog's head, hair and all, given to the patients? I have often picked out the half of a hog's ear with the hair on it from a dish set before a patient to eat. I have picked out bunches of hair, half as large as my little finger, from the patients' food.

Dying patients, if fed at all, were fed on sour milk. The milk,

which is so great a necessity in the treatment of the insane, was almost never fit for use. They had meat never more than once a day, and often not that.

The scurvy alone will speak for the vegetables. Whiskey and sleeping medicine seemed to be the only articles of diet that never failed. The drug room was the greater part of the time turned into a saloon. Often I have had to wait for a prescription, which was needed for an urgent case, until the druggist had served with beer, port, sherry, or whiskey a roomful of men. I never visited the drug-room without trepidation. I always breathed more freely when I had left its degrading atmosphere. Before coming to Kankakee I did not realize the extent of the abuses at the Cook County asylum. The contrast is too striking to allow even the shadow of excuse I tried to raise for the existing state of affairs there to remain.

A lady attendant writes of the same period:

"As I was attendant in two state institutions before coming to Jefferson, I was prepared to form an opinion of the management. Management or system there was none. The attendants on the female side of the house indulged freely in stimulants, and I have on more than one occasion seen three of the female attendants under the influence of liquor. Some of them used in presence of males decidedly coarse language; in every ward a bottle of sedative mixture and a bottle of whiskey were kept, and these were freely administered by the attendants. It was a common remark: 'It is no use doing any thing for these cranks.' The physician was called only as a last resort, and though diarrhœa and scurvy were very frequent, but little attention was paid to diet. The sick patients were given the same diet as others. The great article of diet was pigs' heads, boiled without being shaved or cleansed. The clothing and cleanliness of the patients received but little attention. For weeks and weeks we were without fine-tooth combs. There was no discipline. The engineers and other mechanics had keys to the female wards, and the assistant engineer frequently visited them in an intoxicated condition, cursing the attendants. Every Saturday a dance was held, supposed to be for the patients, and beer kegs were frequently brought up into the dance-hall and emptied by the attendants and employés after the patients had retired, festivities being kept up till morning. Restraint was used by the attendants at discretion. The night-watch paid but little attention to their duties—how little, may be gleaned from the fact that one morning a patient was found dead partially eaten by rats. The superintendent never went through the wards except in company with visitors, but every morning stuck his head in the door and asked if all was right. Once a patient in wristlets called him names, whereupon he rushed to the bath-room and threw pail after pail of cold water on her."

Through medical influence I was appointed medical superintendent, and found myself associated with a warden who had been a keeper of a saloon where gambling was carried on. He from the first had almost supreme power, and within three months all power, I being in all matters, except the prescription of medicine, his inferior officer. I found the building in a wretched state; there was no means of determining just how many patients were in it, and a careful census revealed the fact that four more patients were on the register than in the institution. In a remote ward patients were found with ulcers swarming with maggots.

The drug store was destitute of the most necessary articles, but one dram of quinine being in the house, although many patients were ill from low types of fever. The drug store was a gin-mill to which every ward politician or grand-juryman paid a visit at the invitation of any employé. The druggist, an able, conscientious pharmacist, complained bitterly of being turned into a bartender, and also of the vile drugs he had had to dispense. The bread was badly baked and full of lumps. The male attendants, as a rule, were coarse, brutal men. I had occasion to discharge five of them within two months for striking patients, receiving my first taste of the discipline of the institution by being knocked down for interfering with one attendant amusing himself pounding a patient. A female attendant was struck by the drunken assistant engineer for reporting him for not attending to a bath-tub stopped up for weeks. The dances on Saturday night were of the character already described. The female wards were visited at all hours by male employés, most of whom had keys to them.

The results of my attempts to regulate these and other evils are thus described by Dr. Clevenger:

"Dr. Kiernan's first order was for the attendants to restrain no patient without an order from a physician. A great uproar followed. This was an unheard-of proceeding there, and much nonsense was talked over the new order. The next order was that the night-watch should not issue medicines to the patients at their own will, but were to call up a physician. As much as ten gallons per month of sleeping medicine of the same kind was dosed

out in the most unskilful way to all classes of noisy patients. Any death resulting from this was, of coarse, 'exhaustion of insanity.' A similar order at Ward's Island caused the watchmen to conspire to make the physicians sick of the new arrangement by waking them up repeatedly and unnecessarily. The same trick was resorted to at the Cook County asylum. In both instances the promptness of the doctors defeated the watchmen, and they grew tired of their own game. Finally, by cases being properly treated through the day, there grew less and less occasion for the nightly potion, and nights pass now frequently with no call upon the physicians, where months before the most furious riot could be heard in all parts of the building. Among the new arrangements which disgusted the gang most of all was all employés being required to take off their hats in the wards and to address the patients as Mr., Miss, or Mrs., instead of by their first names or in other familiar ways. The ruffians got up all sorts of versions and perversions of this order, but it was enforced in spite of them. The most recent change made was to stop the appropriation of the labor of the inmate by a heterogeneous crowd of scamps and divert the insane work to their common benefit. For example, it has been the custom for employés to keep the insane at sewing, knitting, or fancy work, carpentering, etc, and take the product often to the city to sell. The patients were insufficiently clad, and it was only right that the sewing should be for their own benefit. A terrific amount of opposition was brought against this by interested parties."

I pass without comment over the fact that repeated assaults were made upon me by persons determined to put an end to my efforts at reform, to call attention to the fact that during April, May, and June, 1885, no efforts of mine could secure fine-tooth combs for the patients until I borrowed them on my own responsibility. The practice of allowing the ward-workers, dignified as mechanics, keys to the female wards continued until one of them was detected at 1 A. M. making his way into a female ward *en deshabille*. The keys were then taken away for a while, but again given back, and once more a mechanic was detected trying to enter the female ward.

Of the food during this period I shall cite only one illustrative instance. Despite my strenuous efforts the Charities Committee would never adopt a dietary scale. A suicide due to neglect of an attendant whom I had long tried in vain to have discharged led to a general examination, in course of which the cook was asked if the food was always good, and

despite the fact that that very day there were twenty cases of scurvy in the house, said Yes. Whereupon the lady physician held up the iron-ringed, unwashed snout of a pig suffering from catarrh, taken from the patients' food that day, and asked if the cook called that good food. It was decided that the only way to prevent the finding of such things in the food was to have no lady physician.

Now it must be remembered that this institution has cost to run for the past two years nearly twice as much as the State institutions, the actual figures being as follows for 1884:

Asylums.	Patients	Cost.
Cook County	567	$188,000 00
Kankakee	639	101,232 80
Elgin	533	109.519 33
Jacksonville	633	112,888 45
Anna	595	115,560 84
Binghamton, N. Y.	341	72,055 52
Willard, N. Y.	1,743	273,949 48
New York City	1,285	162,569 34

This comparison speaks for itself when it is remembered that the institutions are among the best managed in the country.

The cause of these evils is lack of proper supervision, and the remedy is to change the system by giving the conscientious and able members of the Board of Charities the powers of the Wisconsin Board, and at the same time allowing them to appoint volunteer visitors to institutions of a character similar to those of the New York State Charities Aid Association. Only legislation of this kind will rid Illinois of its disgraceful county provision for the insane.

In the discussion, Dr. CLEVENGER said that a committee was appointed by the Society a year ago to investigate the condition of the Cook County asylum and the treatment received by the insane patients therein. The committee was invited to co-operate with the citizens' association, but had failed to pursue the investigation, and had never reported to the Society. Political influence was brought to bear upon the committee, and it utterly failed to accomplish the purpose for which it was created. The speaker gave it

as his opinion that members of the committee were hired to discontinue the investigation. He observed that $900 appropriated by the County Board to the Rush Medical College was given to the College of Physicians and Surgeons shortly after the investigation into the affairs of the county asylum was discontinued. Certain members of the committee, he continued, were also members of the faculty of the latter college.

Dr. R. TILLEY said he was one of the committee appointed by the Society. He did not know that the committee had been discharged, and was ready to pursue the investigation whenever the Society desired, or the other members of the committee were willing.

Dr. C. T. PARKES said the news of the abuses in the county asylum should be spread broadcast over the land. It would be a step in the right direction to take the affairs of the institution out of the hands of ward-workers and place it under the control of the State Board of Charities.

Dr. PAOLI said the Cook County asylum as at present managed was a disgrace to the city, the State, and the nation. It should be turned over to the State Board instantly. As a member of the last year's committee of investigation, he denied any intention to stifle inquiry. He was willing to do his part toward exposing whatever rascality or inhumanity existed in the asylum.

On motion, a committee of five, composed of Drs. Paoli, Brower, Moyer, Clevenger, and Kiernan, was appointed to secure such legislation as will place the asylum under the management of the State Board of Charities.

Dr. D. W. GRAHAM said the committee should be instructed to work until after the next meeting of the Legislature. In the meantime every effort should be made to work up a public sentiment favorable to the reforms contemplated. Every effort should be used to have proper laws passed, and the care of the insane should no longer be confided to politicians and their appointees.

Dr. D. R. BROWER said that, while he was in favor of the scheme to transfer the asylum to the State Board of Charities, he feared it would prove futile. He had for years

vainly endeavored to secure legislation in regard to the manner of committing insane persons by juries.

Dr. KIERNAN said that Dr. Brower was somewhat pessimistic. In the case of the lunacy law, public prejudice was against a proper law. In the present instance public prejudice would be with the law.

On motion of Dr. H. GRADLE, it was voted to retain an attorney to look up the law and report if the management of the asylum could be taken out of the hands of the County Board.

Reviews and Bibliographical Notices.

A Treatise on Nervous Diseases, their Symptoms and Treatment. By SAMUEL G. WEBBER, M.D., pp. x., 415., New York, 1885.

The medical student and the general practitioner have long needed some brief manual of nervous diseases as a trustworthy guide to diagnosis and treatment, unencumbered with treatises on the theory of ataxia, the functions of the corpus striatum, or the details of electrical reactions. The present volume has been written to supply that need, and to give the essentials "for the study of nervous diseases within as brief a compass as possible." The result is a volume larger than the author first intended, yet small enough to be read, and containing enough information to enable the physician to diagnosticate and treat correctly even the rarer forms of nervous diseases, and to do something in the way of their localization.

The first few pages are devoted to a general introduction, giving various simple but satisfactory methods of testing sensation and motion, and mentioning with sufficient fulness the different complications that are likely to arise in certain cases and the best ways of treating them. The remainder of the work is divided into four sections, on the brain, the cord, the peripheral and sympathetic nerves, and on unclassified nervous diseases. It may be hypercritical to object to any arrangement, which after all is but a form, yet for a beginner it is certainly easier to begin with the simpler forms of disease of the nervous system, like diseases of the peripheral nerves or of the cord, than with the more difficult subject of diseases of the brain.

The subject of the anatomy of the brain is treated concisely, clearly, and with sufficient thoroughness. Most of the diagrams, fifteen in number, are taken from Ecker, Wernicke, and Erb, and are plain and simple. One annoying error, which has escaped the proof-reader's notice, and which might mislead a beginner, is found in Figure 5, which represents the external capsule as between the island of Reil and the claustrum, instead of between the claustrum and the lenticular nucleus. The remarks on localization are full

enough for all practical purposes and are in accord with our present knowledge. The chapters which follow deal with the various diseases of the brain and its membranes, and are on the whole very good. Brevity has been the author's aim throughout, and hence his remarks on etiology are generally very brief, leaving the physician to fill in the details from the outlines given. In pathology the essential and admitted facts are given, disputed theories are occasionally mentioned, but the author does not hesitate to admit our ignorance of many doubtful points, and to refer the reader to the larger treatises for a full discussion of the subject. His consideration of symptoms is usually very good and is sufficiently full, although at times it seems as if greater clearness might be gained by a little more systematic arrangement. The details of treatment are, of course, founded mainly upon personal experience, and the directions given are sensible and as effective as could be expected. It is unfortunately not the custom to consider general paralysis in the works on nervous diseases, yet considering how often it is overlooked, even by nervous specialists, and how often it is mistaken for other purely "nervous" affections, we would have been glad to see the author disregard the custom, even at the expense of adding a few more pages to his book.

Much of what has been said of the section on the brain may also be said of the other sections. We are glad to see that the author is unwilling to classify Landry's paralysis as a distinct disease. It might have been better to put the chapter on pseudo-hypertrophic muscular paralysis next to that on progressive muscular atrophy, considering the possible relation between the two, instead of placing it as an appendix to the whole section on spinal diseases. In the diagnosis of diseases of the cord it would certainly have been well to mention the resemblance, slight though it may be, between some cases of multiple neuritis, with pain, anæsthesia, and loss of patellar reflex, and locomotor ataxia; and, although, in the chapter on multiple neuritis, the chances of a mistake in diagnosis between it and progressive muscular atrophy and anterior polimyelitis are mentioned, in the chapters on the two latter diseases no mention is made of multiple neuritis. It is also strange that no mention is made of polioencephalitis with external opthalmoplegia in any part of the book. Although a rare affection and one more likely to come before an oculist, still, even in a manual like this, it deserves mention as much as Thomsen's disease.

On the whole, then, the author has given us a brief, careful, and trustworthy manual of nervous diseases, not only worthy of a place in every general practitioner's library, but of value even to the nervous specialist for whom it was not intended. The man with but a single book on nervous diseases cannot do better than to buy it. One feature in it which merits especial praise, is the admirable bibliographies prefixed to each chapter.

P. C. KNAPP.

The Use of the Microscope. By Dr. CARL FRIEDLAENDER, Berlin. Translated by H. C. COE., M.D. New York: D. Appleton & Co., 1885. Pp. x., 189.[1]

This manual of microscopic technique has passed through two editions within two years in Germany, and this admirable translation deserves to be known widely here. Friedländer, as privatdocent in the University of Berlin, has had considerable experience in giving laboratory instruction, and is therefore familiar with the needs of the student of medical microscopy. He knows just what questions an inexperienced man will ask about the microscope, the instruments necessary to cut, handle, and mount specimens, the manner of preserving specimens, the methods of staining sections, and the way to detect micro-organisms. He attempts to answer these questions in a simple and easily intelligible manner in this book, and he has succeeded. At the same time he has not neglected the wants of the skilled microscopist, for such a one will find many of the latest and most approved methods of staining given in ample detail. It is evident, therefore, that the work fulfils all that can be demanded. It is an additional point in its favor that the information which it gives is presented in a very concise form, and put by the American publishers into a small, portable shape, which is well printed and carefully indexed, and in all respects superior to the German edition.

For the neurologist the book has considerable value, as it contains a description of the recently-discovered methods of embedding in celloidin, of preserving by Erlitzki's fluid, and of staining by acid fuchsin and by Weigert's hematoxylin process. In fact, a special reference is made to the central nervous system under almost every staining method given, and the exact appearance obtained by the various stains is clearly described. While most of the methods given are familiar to those who are at work in laboratories, and are doubtless to be found in their note-books, yet it will be a matter of convenience to many to find these recent methods brought together and readily accessible. It is natural that much attention should be paid by the author to the subject of micro-organisms and their detection. For the tubercle bacillus he prefers the method of staining of Ehrlick, stating correctly that all others are only more or less important modifications of it, while it is perfectly reliable and has not been surpassed. Rindfleisch's suggestion that the entire process can be hastened by heat is approved. It is no small advantage to be told exactly the reason for each step in the process, and what the effect of the various reagents upon the tissue examined is. The examination of fluids is described in an important chapter with some detail; that of tumors, on the other hand, is barely touched upon as passing beyond the limits of the book. The only illustrations given are of various kinds of micro-organisms.

[1] Another translation of this book has been prepared by G. P. Putnam's Sons.—ED.

It is impossible to condense an exhaustive study of histology or pathology into a manual of microscopy. The latter, however, cannot be used to advantage without the aid of a book upon the former containing numerous well-drawn illustrations. Such a work enables the student to compare his own preparations with those of others. Recent works of this character are not wanting, however, and will be of all the more use to those who follow Friedländer's instructions. M. A. STARR.

Sleep-Walking and Hypnotism. By D. HACK TUKE, M.D., LL.D. P. Blakiston, Son, & Co., Philadelphia, 1884. Pp. 119.

Several essays are included in this volume. The first, on "Sleep-Walking," was read before the British Medical Association a year ago. This contains little that is new. The writer does not claim novelty in his work, and announces that the primary object is to draw renewed attention to sleep-walking. To further this end he publishes a list of questions to which he solicits answers. He adds no cases in the few he cites which present essentially new features. Among these he gives the following, with the accompanying remarks:

"One of the most remarkable among the deeds performed by sleep-walkers communicated to me occurred in the person of a mental physician when holding the post of assistant medical officer in a large asylum, and attested by the exceptional evidence of another physician. It is a splendid instance of unconscious reflex action of the brain—the train of events originating entirely from without. On one occasion, when making his usual morning visit in a detached ward occupied by more excited patients, he was about to leave when the nurse said:

"'You have n't seen the new patient, sir.'

"'What new patient?' said Dr. Blank.

"'The patient you brought over during the night, sir.'

"'I brought no patient over during the night," was the reply.

"'Dr. Blank,' said the amazed nurse, 'I 'll let you see the woman,' whereupon she opened the door of a room and showed him a maniacal patient.

"The fact was that Dr. Blank had been roused from bed, had dressed, and had gone down stairs and examined the admission papers. He had received the patient, and as she was much excited, had gone out of doors to this detached room for her; yet in the morning all this was utterly forgotten. Nothing but seeing the patient then would convince the doctor that the event had occurred, and even seeing her did not recall the very faintest recollection of her admission.

"It does not appear that he had made any entry of the admission in a book, but, of course, he must have conversed with those who brought the patient to the asylum."

Dr. Tuke calls this a "very striking example of mental operations *performed in sleep*, and entire absence of recollection of them

next day." He adduces no evidence to show that these operations were performed in sleep. He distinctly states that the man was roused up in the night to receive the patient. There is nothing to prove that this might not be an instance in which actions performed in waking moments between periods of sound sleep are entirely forgotten. We can recall one of such a nature, though not so striking as the anecdote related above. A young lady was waked out of a sound sleep to see a total eclipse of the moon. She sat up in bed, looked at it, made some remarks with reference to it. In the morning she could not recall any thing in connection with the events of the preceding night, or that she had seen the moon at all.

In the essay on "The Mental Condition in Hypnotism," he brings together very much that is interesting. He touches slightly on the injurious effects of hypnotism upon the subject. It is to be regretted that this matter, which is an exceedingly practical one, has not received more attention, either at the hands of the author or others.

He sums up the chief points relative to the mental conditions present in hypnotism as follows:

1. There may be consciousness during the state of hypnotism, and it may pass rapidly or slowly into complete unconsciousness, as in the somnambulistic state; the manifestations not being dependent upon the presence or absence of consciousness, which is merely an epiphenomenon.

2. Voluntary control over thought and action is suspended.

3. The reflex action, therefore, of the cerebral cortex to suggestions from without, so long as any chance of communication is open, comes into play.

4. While consciousness is retained, the perception of reflex or automatic cerebral action conveys the impression that there are two egos.

5. Some of the mental functions, as memory and imagination, may be exalted, and there may be vivid hallucinations and delusions which may persist after waking.

6. Unconscious reflex mimicry may be the only mental phenomenon present, the subject copying minutely every thing said or done by the person with whom he is *en rapport*.

7. Impressions from without may be blocked at different points in the encephalon according to the areas affected and the completeness with which they are hypnotized; these are impressive or suggestive whether by gesture or word or muscular stimulus, may take the round of the basal ganglion only, or may pass to the cortex, and having reached the cortex, may excite reaction and reflex muscular action with or without consciousness, and wholly independent of the will.

8. There may be in different states of hypnotism, the opposite conditions of exaltation and depression of sensation and the special senses.

GRACE PECKHAM.

Die Elektricität in der Medicin-Studien von Dr. Hugo v. Ziemssen. Zweite Halfte. Diagnostisch-Therapeutischer Theil. Berlin, 1885.

This volume of 190 pages is the second half of a work of which the first half was published thirteen years ago. During that period many treatises on medical electricity have appeared, among them those of Meyer, Erb, Rosenthal-Bernhardt, and De Watteville. The author of the book before us displays considerable courage in challenging a comparison between his belated effort and the works just mentioned. That he was justified in doing this no one will doubt who is acquainted with the recent literature of the subject, and who will take the trouble to read Ziemssen's "Studies." While the first half of the work may have become antiquated (it is out of print), the second half is fully up to date. Indeed, no one could wish for a better critical review of the most recent investigations in this branch of medical science than is to be found in this little book. It is refreshing to read the sober criticisms of a man who is himself a thorough investigator into the subject-matter of which he writes, and not a mere compiler.

Part II. of Prof. Ziemssen's treatise is subdivided into two main sections; the first on electro-diagnosis, and the second on electro-therapeutics. In the introduction the author makes a strong plea for the use of the absolute galvanometer, and advances such arguments as are now familiar to all. There follow pregnant remarks on the various methods of electrical examination, and on the increased or diminished excitability of nerve and muscle, all of which lead up to the consideration of the reaction of degeneration. We have never read a clearer presentation of this difficult subject than the one here given. In addition to a lucid account of the clinical aspect of the RD, Ziemssen gives a minute description of the histological changes giving rise to the various phenomena of the reaction of degeneration.

As chief of a large clinic and medical institute, Prof. Ziemssen has been able to interest younger men—his assistants—in the many difficult problems still to be solved in connection with this very subject. Thus H. Gessler ("Die motorische Endplatte und ihre Bedeutung für die periphere Lähmung") has studied the relation of the nerve-endings in the muscles to the reaction of degeneration and to the process of regeneration. He finds that the "terminal nerve-plates seem to be to some extent independent of the nervous system, and in regard to their physiological function, to belong to the muscle rather than to the nerve. * * * Among regenerative processes the regeneration of the terminal plates is the first to set in."

As regards the electrical phenomena of the RD, Ziemssen inclines to the view (which has been steadily gaining ground) that the modal changes in contraction are by far the most important; that in some cases of partial RD, in which the excitability of the nerve and the farado-muscular contractility are preserved, and in which there is no reversal of the normal formula of contraction, a sluggish contraction is the only and constant symptom.

In view of the valuable additions which the author and his assistants have made to the study of the reaction of degeneration, it is rather surprising that he (the author) should have found it worth his while to protest against Erb's unmistakable claims to priority of discovery. In an able reply (in a recent number of the *Berl. klin. Wochenschrift*) Prof. Erb shows conclusively that the important facts of the typical RD were first established by him, and that, although Ziemssen and Weiss gave the first experimental proof of the partial RD in animals, Bernhardt and Erb were the first to prove this form of reaction in man.

But to return to the work in hand. Our author's views on electro-therapeutics are characterized by a conservative spirit that inspires confidence in all he has to say on this head. He believes the electrical current, if properly administered, to be a powerful therapeutic agent, but it is not a cure-all. The indications for its employment and for the current to be used are still empirical. "The best advice we can give is that the physician use both currents, the faradic and galvanic, in succession at each sitting." This advice is rather extreme, and the author himself is evidently very eager to depart from this rule, for he welcomes Enkelskjön's suggestions as a move in the right direction, although he does not feel warranted in accepting them until they shall have received further corroboration. In the matter of using weak or strong currents, Prof. Ziemssen inclines rather to Müller's views (referred to in the April number of this JOURNAL).

The various current methods of electro-therapeutical application are given in great detail. The customary and vague compliments are paid to the methods of general faradization and central galvanization. As for the electric bath, the author adheres closely to the views of Eulenburg and Lehr, and finds it a convenient means of general electrization. He is not particularly charmed with static electricity, and finds that the indications for its use are "rather vague," and hopes that men of sound judgment and of a critical turn of mind will give their attention to the methods of Franklinic electricity and to the method of general electrization. Careful electrization of the brain is recommended in organic as well as mental affections. The short chapter on the treatment of peripheral paralyses is full of good suggestions, and should be read by the student in connection with the chapter on the RD in the first section of this book.

Prof. Ziemssen's little volume will be enjoyed by the beginner (provided he shall have mastered as much as is contained in De Watteville's "Medical Electricity"), and still more by the neurologist who is anxious to be up to date, and who will compare this short treatise with certain bulky volumes which were considered standard books about ten years ago. It remains to be said that Prof. Ziemssen's style is good, and his language easy to understand. B. S.

Editorial Department.

CORTICAL LOCALIZATION.

THE old controversy between the physiologists Goltz and Munk has been again revived. The discussion on the localization of cortical functions at the meeting of German naturalists in Strasburg proved that the whole question is still *sub judice*. At that meeting Prof. Goltz, who is evidently very eager to obliterate the impressions of his unsatisfactory demonstrations at the London and Berlin Congresses, exhibited four dogs with mutilated brains. Goltz claimed that No. 1 had forfeited the greater part of the left cerebral cortex ; No. 2 the greater part of both occipital lobes ; that in No. 3 all but the frontal lobes had been destroyed ; and that in No. 4 the internal capsule had been completely divided. None of these dogs exhibited those defects which Munk's theories would lead one to expect. The dogs were shown at a morning session, and in the afternoon Goltz demonstrated the brains of these animals. These operations of Goltz's were quite successful, and exception was taken only to No. 4, whose internal capsule some members of the Congress thought had not been entirely divided. Prof. Goltz must therefore adduce further proof if he hopes to convince us that "destruction or division of the internal capsule is not necessarily followed by paralysis of the muscles of the opposite side of the body." We have the very greatest admiration for Goltz's genius, but it would be well if he would pay more attention to human pathology.

A capable critic observes that each one of Goltz's four dogs exhibited some peculiarity of behavior, and that, therefore, the question of localization of functions was not definitely settled by this demonstration ; but it is a mistake to suppose that Goltz is

warring against every theory of localization; he is opposed mainly to such "mapping out" of the functional areas of the cortex as Munk and Ferrier have indulged in. Ferrier's areas have fallen into disfavor, and it is questionable whether Munk's limited areas will stand the test of further investigation. It is worthy of note that von Gudden is inclined to accept the views of Goltz, and that Nothnagel concedes the force of Goltz's arguments, and believes that the facts of human pathology and of experimental physiology can be reconciled only by assuming that one hemisphere can assume the functions of the other more readily in animals than in man. But how about the maintenance of special functions after extirpation of those areas in both hemispheres which are supposed to govern such special functions? And if any one part of either hemisphere can act as substitute for any other, then there is no true localization.

Correspondence.

THE NAMES OF THE ENCEPHALIC ARTERIES.

ITHACA, N. Y., October 24, 1885.

TO THE EDITORS OF THE JOURNAL OF NERVOUS AND MENTAL DISEASE:

The report of my paper "On a Seldom-Described Artery (*A. termatica*), with Suggestions as to the Names of the Principal Encephalic Arteries," in the "Transactions of the American Neurological Association," pp. 33, 34 (JOURNAL OF NERVOUS AND MENTAL DISEASE, vol. xii., No. 3, pp. 348, 349, July, 1885), contains an error, due to my own inadvertence, which can be most effectually corrected if you can spare the space for the following table, as amended. Instead of two cerebellar arteries, there are three, *superior*, *anterior*, and *inferior*, the mononymic new names for which are *præcerebellaris*, *medicerebellaris*, and *postcerebellaris*, and the English paronyms of these, *precerebellar medicerebellar*, and *postcerebellar*.

Common Latin names.	Proposed names.	English paronyms.	Abreviations.
Verterbralis.	Vertebralis.	Vertebral.	*vrtb.*
Basilaris. (*az.*)	Basilaris.	Basilar.	*bslr.*
Cerebellaris superior.	Præcerebellaris.	Precerebellar.	*prcbl.*
Cerebellaris anterior.	Medicerebellaris.	Medicerebellar.	*mcbl.*
Cerebellaris inferior.	Postcerebellaris.	Postcerebellar.	*pcbl.*
Cerebralis anterior.	Præcerebralis.	Precerebral.	*prcb.*
Cerebralis media.	Medicerebralis.	Medicerebral.	*mcb.*
Cerebralis posterior.	Postcerebralis.	Postcerebral.	*pcb.*
Communicans anterior. (*az.*)	Præcommunicans.	Precommunicant.	*prcm.*
Communicans posterior.	Postcommunicans.	Postcommunicant.	*pcm.*
Choroidea anterior.	Præchoroidea.	Prechoroid.	*prchrd.*
Choroidea posterior.	Postchoroidea.	Postchoroid.	*pchrd.*

In this connection, permit me to add that in the paper "On Two Little-Known Cerebral Fissures," following the one just named, on pages 350 and 351, *neutromesal*, *callossal*, and *hypocampal*, should be *ventromesal*, *callosal*, and *hippocampal*, and on page 352 *hippocampal* should be included with the "fissures mainly or partly mesal."

B. G. WILDER.

Periscope.

a.—ANATOMY OF THE NERVOUS SYSTEM.

THE CORPUS CALLOSUM.—Prof. D. J. Hamilton, of Aberdeen, has been investigating the course of fibres in the corpus callosum, both in the fœtal and in the adult brain. He finds that this body is not an inter-hemispherical commissure, as is generally supposed, but in reality the decussation of a great part of those fibres derived from the cortex which do not decussate at some point farther down. Fibres from the entire cortex of one side pass over to the opposite side through the corpus callosum, and then turn down into the inner and outer capsules. The bulk of the fibres which enter the internal capsule, both in its anterior and posterior segments, is composed of such crossed callosal bundles, while the motor and other fibres, which come chiefly from the cortex of the same side, which do not pass over in the corpus callosum, and which decussate farther down, constitute but a small part of the entire inner capsule. The outer capsule is composed of two layers, of which the internal is also derived from the corpus callosum, and is made up of fibres which have come through it from the opposite side and turned downwards. The chief destination of these crossed callosal fibres is the optic thalamus, although a few are traced to the caudate nucleus, and to the gray masses of the pons.

This view of the course of the collosal fibres is founded upon a study not only of the brains of the ape, monkey, horse, sheep, dog, cat, and pig, but also of human brains, both fœtal and adult. In the human fœtus at the fourth month, the callosal fibres are medullated, while no others are ; and hence they can be distinctly traced, and may be seen passing, as described, into the inner and outer capsules. In adult brains the same appearance is found when they are prepared in accordance with Hamilton's method. (See *Brain*, July, 1883.) The callosum has not been carefully investigated in the fœtal brain, the statements of Flechsig regarding it being somewhat vague. No theories are advanced by him regarding the function of these crossed callosal fibres. (*Brain*, July, 1885. *Jour. of Anat. and Phys.*, July, 1885.)

It is evident that this view is contradictory to all the statements of former anatomists, that it is opposed to the theory that similar parts of the two hemispheres act synchronously and harmoniously by their union with one another through commissural fibres, and that it overthrows all existing theories regarding symmetrical action of the two halves of the body under a joint action of the two hemispheres of the brain. Brain physiology, which does not rest on anatomical and pathological facts, is always questionable, and if the statements of Prof. Hamilton are confirmed by other investigators, pursuing both his own and other methods, the opposing theories will have to yield. The results here summed up were presented in an incomplete form to the Royal Society two years ago, and it is rather remarkable that such an important discovery should not have awakened more criticism. It is to be hoped that they will arouse an interest in this part of brain anatomy, which may result in more definite information regarding the function, as well as the structure, of the corpus callosum, than we at present possess.

THE FORMATIO RETICULARIS—ITS GRAY NUCLEI AND FIBRE-SYSTEMS.—Bechterew has published (*Neurolog. Centralbl.*, Aug. 1, 1885) a valuable paper upon the formatio reticularis of the medulla and pons, the discoveries announced being based upon an examination of this part in a series of fœtal brains, studied in Flechsig's laboratory.

The formatio reticularis lies between the gray matter of the floor of the fourth ventricle and the longitudinal fibres of the pyramidal tract, making up the greater part of the dorsal half of medulla and pons. Flechsig divides this area into two parts—an inner and an outer. In the medulla the inner area is bounded internally by the raphé, and externally by the hypoglossal root; the outer area is bounded internally by the hypoglossal root, and externally by the vagus root. In the pons the abducens root separates the inner from the outer area.

Bechterew describes several nuclei lying in this formation. In the inner area of the medulla lies the *nucleus centralis* of Roller, at the level of the upper half of the olivary body. Its cells are large, polygonal and spheroidal, and occupy the dorsal half of the area. In the inner area of the pons, in its middle and lower (caudal) parts, lies the *nucleus reticularis tegmenti pontis*. Its cells are of medium size, polygonal, and are scattered through the entire area. Above this nucleus, in the upper third of the pons in the inner area, and near to the median line, lies the *nucleus centralis superior*, whose cells are of medium size, and lie in a fine granular basis-substance. In the outer area of the formatio reticularis, in the medulla, lies the *nucleus lateralis*, just external to the olivary body, and internal to the ascending root of the fifth. In the corresponding part of the pons, in its caudal half, is the superior olivary body. In the tegmentum of the crus lies a third nucleus

hitherto undescribed. It is situated between the red nucleus and the inner border of the lemniscus. It contains small- and medium-sized cells.

The systems of fibres in the formatio reticularis are numerous. In the inner area, next to the gray matter of the floor of the ventricle, lies the posterior longitudinal fasciculus, which Bechterew traces into this part from the primary anterior column of the cord. Ventrad of this, he distinguishes a second system which occupies a small area between the first and the interolivary tract, and which he traces to the primary lateral column of the cord. This latter system passes through and probably terminates, to some extent, in the nucleus centralis of Roller, though some fibres pass beyond this nucleus. Laterally from these two, in the outer area of the formatio reticularis, near the floor of the ventricle, is a third system, which can be traced from the lateral columns of the cord upward to the nucleus reticularis tegmenti pontis. Ventrad of this is another system, extending from the posterior part of the lateral column of the cord to the upper olive. Lastly, the lateral bundles of the lateral column end in the nucleus lateralis of the medulla. Through the entire outer area of the formatio reticularis extends a long bundle, whose origin and termination are uncertain. In the medulla it lies between the floor of the ventricle and the lateral nucleus, and inside the fifth root. In the pons it lies between the facial nucleus and the ascending root of the fifth, and in the crus outside of and behind the red nucleus. This is named the lateral-dorsal system and is thought to pass from the peripheral lateral column of the cord into the internal capsule. It is the only system of fibres which is continuous from the cord to the capsule through the formatio reticularis, and Bechterew believes that it conveys sensory impulses.

The systems of fibres which join the nuclei of the formatio reticularis with parts of the mid and fore-brains, are also numerous. The nucleus reticularis tegmenti is connected with the cerebellum through the anterior portion of the middle peduncle. It is connected with the post. corp. quad. by a bundle of fibres which runs parallel with the lemniscus, and is only to be distinguished from it in fœtal brains. Another bundle, lying just behind the lemniscus, passes from the nucleus near to Meynert's bundle, and with it toward the thalamus. A portion of the lemniscus ends in this nucleus. No other bundles are known.

This communication of Bechterew is of interest, as it is the first attempt to distinguish between various longitudinal bundles of the formatio reticularis. Such an attempt can only be made by the method of Flechsig, and the fact that these observations were made under Flechsig's supervision lend them considerable importance.

The Lemniscus.—This tract through the cerebral axis has recently attracted much interest on account of the researches of von Monakow and Spitzka. Flechsig and Bechterew have ex-

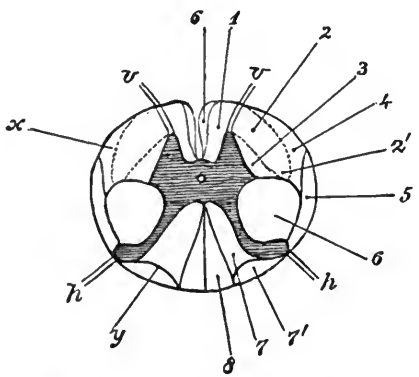
amined a number of fœtal brains, with the purpose of distinguishing its constituents. Flechsig finds that the lemniscus can be divided into three parts in the pons, a medium, a lateral, and a central, or chief part, lying between the first two, and larger than either. The lateral part is the first to become medullated. It extends from the post. corp. quad. downward to the upper olivary nucleus and corp. trapezoideum, thus forming a connection between the acoustic nerve and the corp. quad. This part does not pass down to the medulla or cord. The central part contains several bundles which develop at different times. First, a bundle which can be followed down from the pons through the interolivary tract and sensory decussation to the nucleus cuneatus of the column of Burdach. A portion of this seems to end above in the nucleus reticularis tegmenti pontis. A portion joins the lateral lemniscus, reaches the outer part of the tegmentum cruris, and ends in a hitherto undescribed ganglion lying at the junction of the ant. and post. corp. quad., which Flechsig names the nucleus lemnisci lateralis. A portion passes upward, and is lost in the formatio reticularis at the side of the red nucleus. Second, a bundle whose course below the pons resembles the first. Above the pons this bundle divides into two portions, one passing into the substantia nigra of the crus ; the other passing upward into the internal capsule along the outer border of Luy's body, and thence into the lenticular nucleus, where it is lost in the first and second parts of the nucleus. Third, a bundle which passes downward with the first two, but ends in the nucleus gracilis of the column of Goll. Above the pons this can be followed through the tegmentum cruris and into the posterior part of the internal capsule, where some fibres turn toward the base of the thalamus, and others pass toward the corona radiata, and possibly go to the parietal cortex. Fourth, a bundle which passes from the pons to the nucleus centralis of Roller, and whose further connections are unknown. These bundles develop successively, and each can be distinguished in fœtuses of different sizes, from 30 to 40 cm. long. The median part of the lemniscus receives a medullary sheath some months after birth. It extends from the substantia nigra, and possibly from the mamillary body, down to the pons, but does not extend into the medulla.

From these statements it follows that the chief part of the lemniscus contains fibres which are the continuation upward of the posterior columns of the spinal cord. The fibres that come from the column of Burdach end in the gray nuclei of the medulla, pons, corp. quad., and lenticular nucleus. Those that come from the column of Goll end either in the optic thalamus, or pass through the internal capsule to the cortex of the parietal lobe.—*Neurolog. Centralbl.*, No. 15, p. 350.

THE COLUMNS OF THE SPINAL CORD.—Bechterew has studied the development of the columns of the cord in fœtuses of differ-

ent ages, and finds that it is possible to distinguish by this method several divisions of the lateral column, and two parts of the column of Burdach. The diagram shows these divisions: 1. Primary ant. column; 2, primary lateral column; 2^1, its lateral portion which passes into the superior olivary nucleus; 3, lateral boundary column; 4, peripheral lateral column; 5, direct cerebellar column; 6, pyramidal lateral column; 6^1, pyramidal anterior column (Türck); 7, primary posterior column of early development; 7^1, primary posterior column of late development; $7 + 7^1$ = col. of Burdach; 8, col. of Goll; *v. v.*, ant. nerve roots; *h. h.*, post. nerve roots. This scheme differs from that of Flechsig in distinguishing the columns separated by the lines *x* and *y*.

The peripheral lateral column (4) degenerates upward, as well as the direct cerebellar column, which fact explains the differences of opinion as to the exact anterior limit of the latter column. It also increases in size from below upward.



Cols. 1 and 2 pass into the inner portion of the formatio reticularis of the medulla, near the floor of the fourth ventricle. Cols. 2^1, 3, and 4 pass into the outer portion of the formatio reticularis of the medulla. Col. 5 passes to the cerebellum along the outer side of the formatio reticularis. Col. 6 crosses the median line in the lower decussation, and joins col. 6^1, and both together make up the anterior pyramid of the medulla. Cols. 7 and 7^1 end in the nucleus cuneatus. Col. 8 ends in the nucleus gracilis. From these two nuclei of the medulla new fibres arise which cross the median line in the upper decussation, and enter the interolivary tract of the medulla, there lying between the pyramid and the continuation of cols. 1 and 2.—*Neurolog. Centralbl.*, Aug. 1, 1885. M. Allen Starr, M.D., Ph.D.

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b.—PHYSIOLOGY OF THE NERVOUS SYSTEM.

The Sound Accompanying the Single Contraction of Skeletal Muscle.—Drs. Herroun and Yeo have made a series

of experiments on this subject. The sound heard on auscultating a continuously contracting skeletal muscle is generally ascribed to certain vibrations of the active tissue, of such periodicity as to give rise to a tone of some 36–40 waves per second. The theory that the normal muscle sound might be said to have a relationship to a musical tone has been always used as an important link in the evidence tending to prove that normal nerve impulse is intermittent, and that continuous voluntary contraction is composed of summated single contractions, like the artificial tetanus produced by interrupted stimulations. The fact that the heart beat is but a single contraction is commonly urged against the view that the systolic sound is due to muscular tone, because it is commonly accepted that the sound produced by contracting skeletal muscles depend upon the regular variations of tension of the tetanic contraction. Their conclusions were as follows: 1. That a single contraction of a skeletal or heart muscle gives rise to motions or vibrations which evoke the resonant tone of the membrana tympani. 2 That the tone heard in voluntary contraction is no evidence of distinct or regular vibrations in the muscle, but merely of motions, regular or irregular, which produce the vibration of the membrana tympani. 3. That the tone heard in voluntary contraction is therefore no evidence of regular discontinuity of natural nerve impulses, but simply depends upon trembling movement due to variations either of force or distribution of stimulation. 4. That the objection to the first heart-sound being a muscular sound, because the systole of the heart is a single contraction, is not valid since the single contraction of a muscle causes motions or vibrations which call forth the resonant tone of the ear.—*Journal of Physiology*, vol. vi., Nos. 4 and 5.

SECONDARY AND TERTIARY DEGENERATIONS OF THE SPINAL CORD.—Mr. Sherrington has studied this subject in the dog, using material furnished in great part by Prof. Goltz. Up to the present time, the extent of that region of the cerebral cortex of the dog, injury to which gives rise to degeneration of the pyramidal tract, has not been experimentally determined. He arrived at the following conclusions: that injury to the cord-area of the cortex of one hemisphere causes degeneration in both halves of the spinal cord in the dorsal angle of the lateral columns; that there is no reason to think this bilateral degeneration is a degeneration of the two crossed pyramidal tracts; that the clinical symptoms of a unilateral cortex injury become bilateral and accord with the bilateral anatomical change; that in the dog, after large destruction of both pyramidal tracts, voluntary power is so completely retained that defect of motion is observable only as clumsiness in execution of fine movements; that in the adult dog at least, degeneration of the pyramid tract is accompanied by exaltation of the deep reflexes; that the pyramidal tracts, as marked out by the date of acquirement of the medullary sheath by the fibres, do not coincide with

those marked out by degeneration after destruction of the "cord-area" of the cortex cerebri,—the former are larger than the latter, including as well other fibres which do not come from the brain; that the histology and chronology of the secondary and tertiary degenerations of the spinal cord are not similar to those of the Wallerian degeneration of peripheral nerves.—*Journal of Physiology*, vol. vi., Nos. 4 and 5.

THE EXCITABILITY OF THE BRAIN IN RECENTLY BORN DOGS.—Dr. Joseph Panetti has investigated this subject. Soltmann, who experimented considerably on this subject, arrived at the conclusion that the cortex was excitable after the first ten days, and then did not call out movements simultaneously in all the muscles, but only for the opposite anterior extremity. He experimented upon non-narcotized animals, because in young dogs morphia makes the brain unexcitable. The animals were packed in cotton, and the brain was excited by the induction current. He arrived at the conclusion that in the first days of extra-uterine life, the cerebral cortex was excitable. The place of excitability was in the neighborhood of the sulcus cruciatus; the remainder of the brain-surface is unexcitable. The part of the brain which was excitable was removed, and the nerve-fibres were found to be non-medullated.—*Pflüger's Archiv*, Band xxxvii., Heft 3 and 4.

THE CENTRE OF RESPIRATION.—Dr. Mislawsky has made a series of experiments upon this subject. His results are as follows:

1. Gierke's bundle has no relation to the respiratory movements. They can be divided at the place where they converge toward the central canal, or higher at the level of the calamus scriptorius, yet the respiratory movements continue. These experiments were controlled by means of the microscope.

2. The respiratory movements cease when the group of cells is destroyed, which are lodged in the "lateral or intermediate columns" (Longet). These cells, not previously described, form two centres of irregular form on the two sides of the median line, inward from the roots of the hypoglossal. One-sided destruction of these centres causes arrest of the respiratory movements on the corresponding side. The paths of conduction from these centres to the spinal origin of the nerves going to the respiratory muscles, lie at the height where the central canal is already closed outside Gierke's bundle.

In the experiments where the medulla oblongata is divided from the spinal cord, there is no evidence that automatic centres exist in the spinal cord. The centres which are in the third ventricle, corpora quadrigemina, and aqueduct of Sylvius (Martin and Booker), have only a secondary relation, and must belong to the psycho-reflex apparatus. The separation of the brain and

the corpora quadrigemina does not change, in any important manner, the respiratory movements. The destruction of the centres lodged in them calls out only temporary phenomena, which are connected with other disturbances of the locomotive apparatus. The experiments were made on cats.—*Centralblatt f. d. Med. Wiss.*, Nov. 27, 1885.

THE TEMPERATURE-SENSE.—Dr. Donaldson has made a series of experiments upon this subject. He found that the sensation of cold was felt only at definite points of the skin. The fact was noticed as follows: The sensations of motion as derived from the skin were being studied by means of a metal point which was slowly drawn over the surface. When the motion of this point, which was controlled by a suitable apparatus, was very slow, it often happened that it seemed to stand still for a time, or even be lost, when suddenly a sharp sensation of cold, distinctly localized, would recall its presence and position. Blix also discovered heat-spots in the skin and mapped them out. Mr. Donaldson used an instrument called the "kinesimeter." When Blix found a heat-spot and a cold spot on the skin the warmed point was applied to both, and then the cold point. No sensation followed the application of the warmed point to the cold spot, or the cold point to the heat-spot, thus showing the complete differentiation of these temperature-organs. Mr. Donaldson arrived at the following observations: The parts covered by skin have the temperature-organs in the skin. When the surfaces beneath the skin are tested they are found insensitive to temperature. The papillary layer is not necessary for temperature sensations. The nerves are generally regenerated in the healing of burns and other scars, except in certain places where the connective tissue is very dense.—*Mind*, July, 1885.

MOTOR SENSATIONS IN THE SKIN.—Prof. G. Stanley Hall and Dr. H. H. Donaldson have made a series of investigations upon this subject.

1. Error in judgment of direction of motion on the skin. Here they arrived at the following law: We are more likely, when in doubt, to judge motion on the surface of the limbs to be up rather than down their axis. On the breast, shoulder-blades, and back between them, the tendency was to judge movement to be towards the head, although these parts were less fully tested.

2. Time-relations of judgments of motion on the skin. They found that it takes more time for the judgment of motion down the limb than that of upward movement; that the time for a wrong judgment is much greater than the time needed for a correct judgment; that of the two errors, it takes longer to judge minus to be plus movement than the reverse.

3. Motor sensibility of different parts of the body. They found

that there is a difference in the areas needful to discriminate motion upon different parts of the dermal surface, as there is difference of sensibility in discriminating compass-points far finer than the motor sensibility is. Whether it is more or less variable than the other, and whether it varies with locality in the same manner, our data do not yet enable us to say.

4. Effect of change of pressure or weights. It appears that the time needful for judgment of direction decreases as weights increase, but far more rapidly for the increment from 15 to 45 than for the equal interval from 45 to 75 grammes.

Their conclusion is that "local signs" are quite heterogeneous, and that in the strong tendency we have to move the touching dermal surface over objects in contact with it, we are seeking not merely to multiply but to diversify our sensuous data for judging the nature of the impressions, and to fill up the dermal "blind spots," between which impressions are sifted into us.—*Mind*, October, 1885.

ISAAC OTT, M.D.

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c.—GENERAL PATHOLOGY OF THE NERVOUS SYSTEM.

GILLES DE LA TOURETTE'S DISEASE.—The St. Louis *Courier of Medicine* for September contains a translation of an article by Paul Le Gendre on this subject, reviewing M. Gilles de la Tourette's contribution—*Archives de Neurologie.* The latter author reported nine observations, personal, or derived from La Salpêtrière. One of the cases was published by Itard in 1825, cited anew by Roth in 1850, and by Sandras in 1851 ; later was seen by Charcot. M. de la Tourette includes in the same group of cases Trousseau's laryngeal or diaphragmatic choreas accompanied by "tics" ; also the diseases of "The Jumpers of Maine," reported by Beard in 1880, the *Latah* of Malasia, by O'Brien, in 1883 ; the Myriachit observed by American officers in Siberia, and reported by Hammond in 1884. In all, the principal characteristics are a special motor inco-ordination, and an impulse at first to imitate speech and gesture—*ècholalie*, then to utter, involuntarily, obscene exclamations—*prolalie.* The disease generally begins at an early age, fourth to sixteenth years ; it affects both sexes, but males much more frequently. It has been seen in all classes of society, and in all latitudes. Moral emotions, especially fear, have been invoked as causes, but the true and determining cause is heredity, if not of the disease itself, at least that of a defect of the nervous system.

The mode of commencement is nearly always the same. A special motor inco-ordination is generally observed in the child at school or at home. This consists in crises of muscular twitchings, which agitate one of the upper extremities, then the other, and the face. One of the arms is jerked with convulsive movements ; the fingers extend and flex alternately ; the shoulders are

shrugged up ; the eyes wink incessantly ; one or the other of the buccal commissures is violently drawn up and down ; the masseters in contracting produce a grinding of the teeth ; the tongue is protruded and then drawn back into the mouth, but sometimes not soon enough to escape being bitten ; the head is bent alternately forward, backward, or laterally. Inco-ordination then appears in the lower limbs, and as, instead of being limited to isolated groups of muscles, the contractions affect all the muscles of one or the other limb, often both at the same time, we see the patient stamp with the foot, squat down and rise up, very often jump up, or down, or jump forward. In many cases these different movements are executed simultaneously, and are grouped together to form a special complexus, although varied, the predominance of the contractions in a group of muscles giving to the physiognomy of each patient an objective character quite peculiar. The constant characteristic of the grimaces and contortions is their suddenness and their rapidity. All at once, when nothing in the appearance of the patient causes suspicion of any thing peculiar, the spasmodic movements occur one or more times, and then every thing is in order again. The contractions limited to the face and upper extremities take place very frequently at intervals of only a few minutes ; the greater movements, as jumping, sometimes take place every quarter of an hour, every hour, or less, according to the case. These crises of inco-ordination may be provoked or aggravated in frequency or intensity by moral or physical emotion, the acts of persons near by, or by unexpected sounds. They are completely suppressed in sleep, which is so much the more profound, as the fatigue caused by the gesticulations during the day is greater. They diminish in frequency and intensity in the course of intercurrent febrile diseases. The motor inco-ordination is subject to exaggerations and remissions, more or less complete ; it may in some cases constitute the whole disease ; it is always the first phase of it, which has been known to continue for sixteen years. During this time the physical condition of the patient is as satisfactory as possible. The functions of nutrition continue good ; alimentation is never seriously disturbed ; the general and special senses remain normal ; the mental state remains perfect. These patients are often very intelligent, have perfect consciousness of their state, and make great efforts to master it. The moral state undergoes no injurious influence, except perhaps some habits of laziness which may interfere with their studies.

The second stage of the disease, which may be sometimes indefinitely postponed, manifests, after an excessively variable time, the curious phenomena of *ècholalie*, which follows a constant and altogether special gradation. Most often it is on the occasion of an attack of disordered movements, at the time when the inco-ordination is at its highest, at the acme of the convulsion, that the patient utters forcibly an inarticulate cry—hem, ouh, ouah, ah, —which is repeated several times in succession, at variable inter-

vals. Then, the emission of the sound remaining always sharp and in perfect coincidence with the height of the convulsion, the cry becomes articulated, and the word pronounced takes, in certain instances, the character of an echo. If the patient hears himself called, in a loud voice, he repeats with force and rapidity his own name, and accompanies it with one of his gestures; or, he repeats the last words of some phrase pronounced somewhere near him while making his ordinary convulsive gesture. It is not necessary for the production of *èchòlalie* that an external sound shall strike the ear of the patient; simply the sight of the word which he reads may determine him to repeat the word in a loud voice; the thought alone of the word, or rather of the thing which it represents, may produce the same effect. The patient may repeat, perfectly, words pronounced in an unknown tongue. Besides the *èchòlalie* there exists in certain patients an impulse to imitate gesture and acts. This may lead the patient to perform immodest or even dangerous acts.

A third characteristic symptom is *coprolalie*. It is so frequent and persistent that it is considered pathognomonic. It consists in the utterance in a loud voice of some foul word, an obscene expression, always on the occasion of a convulsion, and in persons whom education and mental condition would seem to place beyond the reach of such inconsistencies. The foul or obscene word is always uttered at the moment of the acme of the muscular action, and the gesture never emphasizes the signification of the word. A combination of *èchòlalie* and *coprolalie* may exist.

The course of the disease is slow and insidious; the commencement is obscure, the successive appearance of various symptoms occurring at variable intervals; the disease once established, periods of exacerbation separated by periods of remission occur, sometimes so marked and so prolonged that one is tempted to believe in a cure; nevertheless, the prognosis seems to indicate incurability. "Once a jumper, always a jumper," said Beard. Life is not shortened by the disease; it has been observed at seventy-eight.

CERTAIN NERVOUS DISEASES OF INDIA.—Norman Cheviers, M.D., in the *Med. Times and Gazette*, No. 1,830, in reviewing the diseases of India, refers to the following peculiar forms of nervous diseases: *Lathyrism.*—Palsy of the lower limbs, caused by eating the *dal* of a lentil, *Lathyrus Sativus*, prevails extensively in Upper and Central India, especially near Allahabad and in Upper Scinde. Recently M. Proust has observed this disease in the Jurjura mountains of Algeria.

Paraplegia.—At and near Chittagoing, on the east sea-board of Bengal, a form of equine paraplegia, known as *kumree*, is so prevalent that, as a rule, horses are not kept there. Burmah ponies, which, if let loose, might find their way home, do well in that climate. He believes that this disease does not originate in Cal-

cutta, or in the Upper Provinces, but occurs in various Indian localities within the influence of the sea breeze. He quotes from a report on the Travancore, which says: "Horses here, as well as along the western coast, are very liable to become weak in the loins, particularly if exposed to the wind when much heated. Castration is often resorted to as a preventative, and it seems to be generally admitted that geldings suffer less frequently than entire horses. When attacked with this complaint, the animal is rendered completely useless." In the report on the marshy district of Quilon, it is stated that in this climate also, horses are liable to this weakness of the loins, which appears to be an affection of the spinal cord, causing paralysis of the hind quarters. A permanent cure is seldom if ever effected. Mares and geldings are rarely attacked. The disease is most frequent during the land winds in November, December, and January.

Paraplegia, affecting the human race, is referred to. It is described by Bontius and his followers as "*Barbiers*," a sage old Dutch physician of that name, having himself suffered from it (see Copeland's Dictionary of Medicine). All paralyses of the lower extremities appear to have been thus designated. The word is no longer used, at least in India. A "*stroke of the wind*" is frequently spoken of. At the onset there is generally partial paraplegia, with sensations of pins and needles in the affected limbs. In the severest cases, the rest of the body becomes paralyzed and deprived of sensation and motion, the limbs become contracted, nutrition fails, and the patient sinks. Marshall saw many cases of it among the Caffres of a Ceylon regiment, but failed to notice it among the Cingalese. The author observed it among Europeans in Ceylon, and saw analogous affections in horses and dogs, from which, however, he never knew them to recover. The cause was evidently chill, especially during sleep. Most of the paraplegia seen in Bengal is attributed to chill, though cases also result from meningeal apoplexy, morbid growths, sclerosis, syphilitic disease, and ordinary causes.

THE PRECHOREIC STAGE OF CHOREA.—C. R. Stratton (*Brit. Med. Jour.*, No. 1,288) considers the possibility of a certain class of cases of chorea, being of infectious origin, and having a prechoreic stage. He gives the following summary of his views: The prechoreic sequence of events appears to be a soreness of the nose or throat, with often a fissure at the anterior margin of the nostril; the sores yielding a micro-organism, which takes aniline dye; an endocarditis, with the formation of valvular vegetations, which undergo coagulative necrosis, and develop colonies of micrococci; the introduction of these products into the circulation producing capillary embolic infarction of the nerve-centres, and of the parts around the joints; with the clinical symptoms of valvular murmur, blunted intellect, paresis, and vague pains. There the case may end, and recovery take place; or it may run on to the choreic sequel,

especially if the child has been exposed to fright or mental shock.

ARTHROPATHIES ASSOCIATED WITH INFANTILE PARALYSIS.—Dr. J. A. Coutts, of London (*Med. Times*), reports cases to show that joint disease occurs in infantile paralysis, which are arthropathies in Charcot's sense of the term. He refers to Charcot's opinion that the joint phenomena in locomotor ataxia will be found to be consecutive to extension to the motor cells of the anterior cornua, along the radicular fasciculi. Again, that Charcot speaks of arthropathies as a factor in paraplegia from Pott's disease, tumors occupying the gray spinal substance, progressive muscular atrophy, acute myelitis, etc., although he gives no instance of it in infantile paralysis. The writer's attention was called to the subject by Barlow's paper on rheumatism in children, in which he warns his readers against confounding an affection occurring at the commencement of infantile paralysis with rheumatic manifestations. He has observed the following cases: 1. Male child, aged sixteen months, had been ill for six days when first seen. The mother stated that he was slightly feverish at the onset of the attack; there had been no convulsions, no movement of the left leg since the attack. On examination, the left ankle presented obvious swelling, but permitted free handling without pain or discomfort. It seemed warmer than the unaffected joint; the same condition along with a slight hyperæmia obtained in the whole left limb below the knee, and was not localized in the ankle-joint. There was no history of accident, and no bruising of the tissue about the joint. The left leg was flaccid, and the knee-jerk unobtainable, though readily elicited on the other side. The diagnosis of infantile paralysis was borne out by the result. At the end of a month the swelling of the ankle-joint was still present. There had been marked wasting of the muscles, the circumference of the left leg being nearly an inch less than that of the right, and its temperature much lower. The contrast between the wasted limb and the swollen ankle-joint presented a striking appearance. 2. Male infant, aged eleven months, at onset nothing beyond slight feverishness and fretfulness. A month later, when seen at the hospital, there was noted wasting of left leg, its circumference being nearly half an inch less than the right, with some flaccidity and loss of temperature. There was swelling of the ankle-joint, which had made its appearance a few days after the child had been taken ill. The dorsum of the foot was also puffy and swollen, as if œdematous, but the swelling was firm to the touch, and did not pit on pressure.

These cases ran the ordinary course of infantile paralysis. The swelling of the joints gradually disappeared in six weeks.

The author excludes rheumatism, on account of its rarity at such an early age, the absence of local tenderness and redness, the course of the disease, and its long localization in one joint. He

concludes that the joint-lesions were of spinal origin, and due to the same exciting cause as the paralysis.

Cases of Raynaud's Disease.—Dr. Colcott Fox has reported two cases of this disease to the Clinical Society of London. A woman, æt. forty-one, of extremely nervous temperament, dated her disorder ten years back, but she had probably had slight attacks some years previously. In the earlier stages all her fingers continually went "like white wax." This condition of recurrent local syncope gradually gave place to local asphyxia, and the feet became involved. The fingers gradually lapsed into a state of chronic asphyxia, which was intensified by frequent attacks of more severity, often leading to "blood-blisters" and ulceration. The nutrition of the phalanges suffered greatly, her hands being crippled, the fingers fusiform in shape, livid, shiny, and withered, the nails variously distorted, and the end plalanges much atrophied and almost immovable. The nose and ears become affected to some extent on exposure. Cold and nerve shocks are exciting influences. The second case, that of a male, æt. fifty-one, like one of Raynaud's cases, had diabetes. His hands were deformed, but he had suffered for several years with "dead fingers." He sought Dr. Fox's advice for symmetrical gangrenous patches on the skin, which recurred, and later for an attack of asphyxia of one great toe and lower third of the inner side of the leg, and then it was found that the other toe had been affected even more severely. On another occasion blood-blisters had formed beneath the ends of his toes.

Dr. Frank R. Fry, of St. Louis, also reports two cases. 1.—A female, æt. thirty-two, had been under observation for two and a half years, having suffered from extreme general anæmia—or spanæmia,—also uræmia, metrorrhagia, and great debility. Her heart was weak and irritable. She gave a syphilitic history. The symptom indicative of Raynaud's disease was the apparently bloodless condition of her hands. From the tips of the fingers to the wrists they had a bluish-white color, and the feel could only be described as cadaveric. She complained of an almost constant aching in them. The feet were in a somewhat similar condition, ischæmia not being so extensive as in the hands. This attack lasted for a week; later she improved, the attacks becoming less severe and less frequent. 2.—Male, æt. seventeen; when first seen all the fingers of both hands back to the metacarpo-phalangeal joint were in an asphyxiated condition, apparently bloodless, cold, and stiff. He moved and used his hands in a clumsy manner as if they were stiff from cold. Sensibility was much obtunded, though pain accompanied and followed this condition. His attacks had commenced about one year previous. They occur from one to three times a day, and last from fifteen minutes to an hour. Nothing abnormal was found except a slight irregularity and feebleness of the heart.

Hemiatrophy of the Face.—Dr. Giovanni Mingazzini, *Lo Sperimentale*, Feb. —, reports the case of a Roman girl, who had had intermittent fever from childhood; when fifteen, left hemiplegia occurred suddenly, getting slowly better after nine months. Later, cardiac disease was discovered. When eighteen, she was again seen for increased discomfort from aortic disease, and right facial hemiatrophy was observed. The right cheek was only slightly atrophied, but flushed on excitement more easily than the left; the lips and nose were twisted to the right, the right half of the tongue and of the uvula was atrophied, the right eye sunken and rather small and more watery, and on the right side the molar and canine teeth had fallen out. Surface temperatures were carefully taken and showed the atrophied side the warmer in all cases: on the cheeks the difference being as much as 1.5° F., in the axillæ 0. 7°, on the sides of the ad 0° 4. There was neuralgic pain over the right side of the head, indefinitely localized. No pain was caused by pressure on the cervical ganglia. Surface temperatures have been observed in two previous cases; in one Friedenthal found the affected side warmer than the unaffected; in the other Brenner found it less warm. There are no *post-mortem* records of such cases. The author attributes the condition to a lesion of the cervical sympathetic affecting the trophic fibres of the fifth nerve.—*The Practitioner.*

A Case of Paralysis of the Lower Extremities with Hypertrophy of the Skin, Subcutaneous and Muscular Tissues.—Dr. John K. Mitchell, in the July number of *The American Journal of the Medical Sciences*, records a curious case, a female, aged fifty, which presents a total of several unusual conditions—paralysis, without any degenerative reaction, enormous hypertrophy of the skin and subcutaneous tissues, and increase of the size of the muscles due to the extraordinary overgrowth of their fibrillar elements. It has certain features in which it resembles scleroderma, and some that are like elephantiasis, and without the microscopic investigation it might have been taken for what on the first superficial examination of the patient it was thought to be, pseudo-hypertrophic paralysis.

But the skin had not the tense, hard induration which scleroderma shows. Scleroderma is usually found with more or less pigmentation; it begins with pain and œdema, and is nearly always accompanied with atrophy of the underlying muscles, and though it varies in position and may be limited or diffuse, it is seldom or never so absolutely symmetrical as the lesion described. Certainly there is a slight likeness to elephantiasis in the skin condition, but the general fever and inflammatory symptoms of that disease were never present, nor has the course been like that of elephantiasis, which progresses by recurrent attacks.

Nor on careful comparison does it seem much like the pseudo-hypertrophic paralysis. The age of the patient—this paralysis is

almost unknown in adults except where it has continued from infancy,—the persistence of the knee-jerk, and the troubles being, even after lasting so long, entirely confined to the lower extremities, are some of the differences. Here, too, no loss of voluntary contractility in any other than the affected muscles, nor any atrophy of the pectoral or dorsal muscles, a condition which Gower calls diagnostic of pseudo-hypertrophy, could be discovered. To the eye and touch, besides, the muscles in this case were much more lumpy and less homogeneous than they are in the false overgrowth.

A few cases of true muscular hypertrophy have been reported. The overgrowth in all of them was limited to the muscular tissue, and the malady began after great and long-continued exertion, or after depressing disease or injury. All of them were unilateral and in one limb only. Studies of extracted fragments of muscles showed the fibres to be double the natural breadth, and demonstrated an increase in the number of nuclei.

So far as Dr. Mitchell has been able to discover during the year which has passed since he first examined the case, there has been nothing like it known, and he thinks he has good grounds for saying that the complexus of symptoms is entirely a new one.—*Maryland Med. Jour.*

Hysterical Hemianæsthesia.—Dr. F. C. Fernald, of Washton, D. C., in a paper published in the *New York Medical Journal*, No. 362, giving the clinical pictures of hemianæsthesia due to hysteria, to alcoholic intoxication, to chronic lead-poisoning, and to organic brain disease, reports the following case of hysterical hemianæsthesia with hysterical hemiplegia. The patient came to the out-patient nervous clinic of the Massachusetts General Hospital, in which the writer was assistant. E. B., female, thirty-four years old, married, complained of inability to use the right arm and right leg; was able to walk with some difficulty by aid of cane; movements of arm and fingers possible but awkward. This inability to use her arm and leg had been going on for over two years. Previous to this trouble she had pain in right shoulder and arm, which she attributed to strain occasioned by housework, to which she was unaccustomed. After two months of pain she suddenly became hemiplegic. At the time of her visit to the clinic the knee-jerk was normal; there was no apparent atrophy of muscles on the affected side. By black-board test, the field of vision of right eye limited; color-perception also impaired in same eye; hearing on this side dulled to both air and bone-conduction; taste on right side of tongue absent; unable to distinguish the odor of terpentine in right nostril. Her general health was good. With encouragement was able, after a few minutes, to walk without the cane.

Depression of the Occipital Bone.—Dr. H. G. Lyttle reported before the Clinical Society of the New York Post-Graduate

Medical School, the case of a child, two months and six days old, with a marked depression of the occipital bone, with overlapping of the parietal. The child had slight convulsive movements of the hands and rolling of the eyes, with a disordered condition of the stomach and bowels. Dr. J. Hartigan had reported, in the *American Journal of the Medical Sciences* for January, 1884, forty-nine cases of trismus nascentium as being due to this cause. Dr. Lyttle presented this case to show that displacement of the occipital bone might occur without producing trismus.

W. R. BIRDSALL, M.D.

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d.—MENTAL PATHOLOGY.

SEXUAL PERVERSION IN A FEMALE.—Dr. Kiernan (*Detroit Lancet*, May, 1884,) reports the following case of sexual perversion in a twenty-two-year-old girl who had a neurotic ancestry on the paternal side. Her face and cranium are asymmetrical. The patient has always liked to play boys' games, and to dress in male attire. She has felt herself at certain times sexually attracted by some of her female friends with whom she indulged in mutual masturbation; these feelings come at regular periods, and are then powerfully excited by the sight of the female genitals. The patient, in the interval, manifests only repugnance to attentions from men. She has been struck with the fact that while her lascivious dreams and thoughts are excited by females, those of females with whom she has conversed are excited by males. She, therefore, looks upon these feelings as of a morbid nature. At times she is troubled by imperative conceptions, such as that if she turns her head around she will break her neck; to avoid this ideal danger she at times carries her head in a very constrained position.

MENTAL ASPECTS OF CHOREA.—Dr. H. R. Stedman (*Boston Medical and Surgical Journal*, August 6, 1885) states that although many of the ordinary symptoms of chorea are attended, at some stage, by mental phenomena, the motor symptoms so far predominate as to completely mask them. On the other hand, in the most severe cases, the mental disturbance which is often quite pronounced, being intensified by the energetic character of his movements, is apt to mislead the practitioner, who regards the case simply as one of insanity and sends him to the asylum. Whereas, if the case were recognized as one of chorea, he would hesitate to do so.

CARDIAC DISEASE AMONG THE INSANE.—Dr. T. Duncan Greenless (*Journal of Mental Science*, October, 1885) concludes: 1. That heart disease occurs with greater frequency among the insane than among the sane. 2. That this increase in frequency is in

part regulated by the frequency of heart disease among the sane population in the vicinity of the asylum where the observations are made. 3. That heart disease is more frequent among the insane in counties where the ratio of the insane to the sane is greatest. 4. That the distribution of heart disease among the sane is regulated by the geographical position, dietetic and other influences acting as predisposing causes. Similar conditions appear to exercise an influence over the frequency of heart disease in the insane. 5. That the numerical difference between heart disease in the sane and insane is not great, being 8.72 per cent. of the total deaths in the former, and 9.36 per cent. in the latter. 6. That, according to his observations, heart disease is present in 12 94 per cent. of the living insane, and is the cause of death in 13.51 per cent. Both on admission and at death, the age of the greatest number, who had heart disease, was between sixty and seventy. 7. That the clinical symptoms of mitral regurgitation in the living insane, and the mitral disease with left-sided hypertrophy *post mortem*, are the most common affections. 8. That the hearts of the insane are heavier than those of the sane, and this condition is more especially noted in paretic dementia, where the heart is very frequently hypertrophied. 9. In many of the insane the general circulation is sluggish and the extremities are cold. livid, or even swollen. This condition occurs most frequently in chronic or advanced cases of insanity. 10. That the arteries are diseased very frequently in the insane, but arterial atheroma does not occur earlier than among the sane. In paretic dementia atheroma is independent of the age of the patient, and appears to be influenced by the duration of the disease. 11. That among the sane heart disease appears to exercise an important influence on the mind, and this mental change may reach insanity. 12. Not only does heart disease alter the type and delusions of insanity, but cases in which the cardiac disease seems to be the predisposing cause of insanity. These conclusions are simply corroboratory of the results of Griesinger, Luys, Burman, Dickson, Savage, Solfanelli, D'Astros, Sioli, Morel, Krapelin, Forbes Winslow, Mildner, Fothergill, Spitzka, Salemi-Pace, Clevenger, and Kiernan. The last concludes (*American Journal of Neurology*, No. 1, 1884): 1. That cardiac disease produces psychical symptoms, depression and hallucinations as well as delusions. 2. That cardiac may modify coexisting insanity. 3. That insanity may produce cardiac symptoms.

INFLUENCE OF ERYSIPELAS ON INSANITY.—Dr. Landerer (*Allgemeine Zeitschrift für Psychiatrie*, Band xli., Heft 4 and 5) reports the case of a female melancholiac, who was suddenly attacked by violent cephalic and facial erysipelas, causing deep seated suppuration. *Pari passu* with the acute inflammation, the mental depression diminished until, with the disappearance of the erysipelas, all psychic symptoms likewise vanished.

INFLUENCE OF TRAUMATISM ON INSANITY.—Dr. Roth (*Breslauer Artzliche Zeitung*, No. 5, 1885) reports the case of a thirty-five-year-old female melancholiac, who precipitated herself from a forty-feet-high window, sustaining several cranial fractures. Coincident with the occurrence of acute symptoms from the fractures mental improvement occurred, followed by recovery.

GYNÆCOLOGICAL PROCEDURES IN THE PSYCHOSES.—Flechsig (*Neurologisches Centralblatt*, Nos. 19 and 20, 1885) reports the case of a patient suffering from hysterical insanity which was cured by the removal of uterine fibroma. How much was due to the counter-irritation produced by the operation remains to be determined.

PARETIC DEMENTS IN INSANE HOSPITALS.—Dr. J. A Campbell (*Lancet*, Aug. 8, 1885) states that: "Few cases are more difficult to deal with during their asylum life, none more liable to accident; most of the grave accidents in asylums befall this class of patients. Aggressive habits, without power to make good their threats and actions, are a source of danger from fellow-patients; abusive words, filthy habits, and sudden attacks have often been, though they should not, a provocative of bad treatment from those paid to take care of them. During the period of excitement which in almost every case occurs in the course of this disease, greater attention is needed than in other forms of excitement. More impulsive actions, more utterly hazardous and unreasoning attempts at doing impossible feats, are perpetrated by paretic dements actuated by their delusions of power and grandeur, than we find during the excitement of other diseases. Realizing the fatal issue of this disease, less compunction need be felt in keeping the patient under sedative influence during an acute paroxysm. During the five years ending 1884 I admitted forty paretic dements, and during that time thirty-six died without having sustained any grave injury during their asylum life. I must say I feel a source of danger past when patients of this class lose their power of walking, and I do not regret when such persons become bed-ridden. I probably differ from many in thinking the habit of propping up weak paretic dements in wonderfully-made chairs is not for their good or comfort; it is said to prevent bed-sores, but patients at this stage should be kept clean in bed. With 547 patients, forty of whom are bed-ridden, there is not a bed-sore in the Carlisle Asylum."

AUDITORY HALLUCINATION IN A DEAF-MUTE.—Dr. H. P. Stearns (Report of the Hartford Retreat, April, 1885) reports the case of a lady, both deaf and dumb, who lost her hearing from scarlet-fever when a child, and, in consequence, her speech. "She was educated in the sign language, and her mind became very quick and active. She read books and magazines with eagerness;

conversed in the sign language with ease, and was a great favorite among her friends. When forty years of age, she suddenly, without assignable cause, became despondent, and indisposed to talk. She soon became suspicious of even her sisters ; would take but little food ; lost flesh rapidly ; slept but little, and was so changed that friends placed her under treatment at a private insane hospital, where she remained several months prior to admission to the Retreat. At that time she was greatly excited, feeble, thin in flesh, and sleeping but little. She was much troubled with auditory hallucinations, and constantly endeavored to reply to voices in the air above her head. Her physical and mental condition has changed very considerably at times. During some periods, when most troubled with auditory hallucinations, she will take little or no food voluntarily ; indicates that she thinks it is poisoned, or that persons in the air tell her not to eat. As these hallucinations subside, she resumes eating voluntarily ; gains in flesh, is less excited, and will spend hours every day in looking over pictures in books, and later on, reads magazine articles with apparent interest. This improvement continues for weeks or even months ; she regains strength ; rides and walks daily, and generally seems pretty well ; awakening an expectation of recovery, though it is not certain she is ever wholly free from hearing voices, and she certainly has never regained her natural mental tone and vigor. Then the auditory hallucinations become aggravated, and are frequently accompanied by visual hallucinations. She refuses food, becomes thin in flesh, and goes through an excited period, such as described above. This has occurred several times since she has been Dr. Stearns' patient ; so that she might be considered a case of *folie circulaire*. The interesting point is, that she should, after so many years, during which she has been buried from all sound of the external world, be so greatly annoyed by auditory hallucinations. These are generally caused by irritation, in some manner, of the auditory nerve within the brain, or of a portion of the optic thalamus. These impressions are conveyed to the ego, and cause such sensations as ordinarily arise from vibrations of the atmosphere upon the tympanum. These sounds are interpreted by the ego usually as voices of persons, probably because it is accustomed more often to hear the human voice than other sounds, especially when at home or in the presence of others. But why it should be so in this case, is difficult to explain. The auditory nerve has been in a dormant condition more than thirty-five years. So long a period of inactivity it seems should destroy its functional activity. This, however, has not been the case in this instance, but, on the contrary, it appears to be very active. At times when reclining with her eyes closed, she will start up, cross the room, and reply to some imaginary voice. She will then place her finger upon her ear, to show that she hears, and then, after listening, reply again, thus continuing an imaginary conversation for some time. She evidently regards this hearing with great surprise, but appears to be unable to understand that it is not real. It would seem that

there still slumbered in the personality a remembrance of the voices of childhood, and when the requisite conditions of the tissue of the auditory nerve are excited, the voices which she was accustomed to hear so many years ago, come reverberating back again. She becomes excited, sometimes pleased, but more often distressed ; wonders and grieves, until the system becomes profoundly affected." It is obvious that Dr. Stearns fails to recognize the registering functions of the cerebrum, and is in ignorance of the more recent researches on hallucinations.

Autopsy Findings in a Hebephreniac.—Dr. T. W. Fisher (Boston Lunatic Hospital Report; 1885) reports the following autopsy findings in a hebephreniac: Male, nineteen years. Autopsy three hours after death. Body medium size, fairly developed, greatly emaciated; slight lividity of dependent portions. Calvaria and dura not remarkable ; pia thin and delicate ; meshes contain considerable clear fluid ; vessels of the base and in the fissure of Sylvius not remarkable ; lateral ventricles contain each about 25 c.c. of clear fluid ; ependyma smooth and shining. Brain weighed 1,490 grms. and did not fill the cavity of the skull. On section, brain substance tolerably firm ; everywhere very pale ; tolerably moist ; no puncta-cruenta to be seen. Beyond the pallor the other portions of the brain showed nothing.

Curability of Insanity.—Dr. Pliny Earle concludes from a recent study of statistics (*American Journal of Insanity*, October, 1885) : First, that the old claim of curability in recent cases is not sustained and this failure to sustain it is more striking and apparent than at another time. Secondly, that the percentage of recoveries reported of all cases in this country continues to diminish.

Transformation of Feigned into True Insanity.—Dr. V. Parant (*Annales médico-psychologiques*, July, 1885) says that the idea that an attempt to simulate insanity may result in true insanity is as yet but a theory. All reported cases are to be explained by the fact that people who simulated had already presented unrecognized symptoms of insanity which needed but the strain of simulation to make it demonstrable.

Overwork and Insanity.—Dr. Orpheus Everts (*American Practitioner*, August, 1885,) concludes : "That while overwork in a general sense is a prominent factor in the causation of diseases, some of which are manifested by insanity, overwork in the performance of mental functions is not a sole or frequent cause of such diseases.

Tribadism in Insane Hospitals.—Dr. Lombroso (*Archivio di Psichiatria*, vol. vi., fasc. iii.) calls attention to the existence of

tribadism among female insane patients in insane hospitals. Out of two hundred insane patients under treatment at Pavia ten were addicted to this practice, which had been introduced into the establishment by a fifty-year-old cretin who usually played the male part. The others were an acute maniac, chronic confusional lunatics, and hebephreniacs. The acute maniac abandoned the practice on recovery and spoke of it with disgust. Two sisters admitted at the same time to the Cook County Hospital for the insane had been addicted to the practice, and one of them introduced it into the institution, where, by reason of overcrowding, two patients often require to sleep in the same bed. By separating the two persons the evil proceeded no farther.

PARANOIA OF THE MORAL INSANITY VARIETY.—Dr. C. K. Mills (*Medical and Surgical Reporter*, August 22, 1885) reports the following case of paranoia of the moral insanity variety: "He is of good family, as many of these patients are. By good family I mean principally that the intellect, as far as the other members of the family are concerned, is good. He is now about forty years of age. All that can be said about his childhood is that he was peculiar. He grew up to manhood and began to exhibit certain eccentricities and peculiarities of conduct and behavior. While his mother was very ill, he went through the community and invited a number of people to attend her funeral, and even had the house crowded with people coming to the funeral of his mother before she was yet dead. Then it was noticed that this man of good family and good surroundings now and then committed some form of misdemeanor without any cause for so doing. He obtained money under false pretences, without any excuse for his actions. He went to a Western city, but was unable to keep any position for any length of time, although having a good education and some ability as a writer. He has occupied the position of reporter and editor on a number of newspapers, but was unable to keep any situation for any length of time. He obtained money from one of his relatives on the statement that he wished to use it in obtaining employment. Instead of doing this, he spent the money in feasting reporters and others connected with the newspapers; the result of this expenditure was that he got a few passes to the theatre. Not satisfied with this, he also forged passes to the theatre. He was arrested for forging the passes, and there was a great exposé of the whole matter. He was sent to an asylum. In New York he again obtained money under false pretences, was arrested, and was sent to the penitentiary. He has been in three or four asylums, in a county penitentiary, and other penal institutions. He has done many things to try to gain notoriety. His strong personal characteristics are intense egotism and vanity. He seems to have no appreciation of the distinction between the truth and a lie. I believe that in the interviews I had with him he told more outrageous lies, with more coolness

and appearance of truth, than I have heard from any other individual in the same time. So striking is this characteristic in these individuals, that they impress upon others the apparent truthfulness of their statements, and thus interest others in their statements. It is for this reason that worthy persons—clergymen, physicians, lawyers, philanthropists—have been induced to believe the representations of such people, and fight their battles for them. They can lie so plausibly, give so complacently a history which is entirely the opposite of the truth, that almost any one would believe them. As for the occurrence of distinct delusions in patients of this kind, it would often be difficult to make a point of this. They have delusions as to their own importance. Their reason for doing this, that, or the other thing, is based often upon a delusive idea."

Epileptics in Insane Hospitals. — Dr. J. A. Campbell (*Lancet*, August 8, 1885) states that "in epileptic insanity the influence of continued treatment by bromide of potassium in preventing excitement and reducing the number of fits has been so long proved that I should think the treatment is made use of in most asylums, or should be. Dr. Macphail, in his valuable essay on the blood of the insane, found that the blood of epileptics treated daily with ninety grains of this bromide for periods of over two, ten, and fifteen years, had not been deteriorated by the prolonged use of this drug. I have, however, noticed that epileptics who have been long under this treatment are liable to have congestion of the bases and posterior portions of their lungs; this condition seldom passes further than congestion. Until I recognized the state and its cause, I frequently feared epileptics were liable to double pneumonia. After a succession of fits epileptics should be allowed to lie in bed, and during the period of epileptic excitement no sentimental opinion should prevent their seclusion; for the excitement in epileptic insanity differs from that in other forms—it is more easily acted on by outward causes, it subsides more quickly in solitude, and its characters render it more dangerous to the sufferer and those around him."

Non-Restraint in the Treatment of Insanity.—Dr. Bryce (Report of the Alabama Insane Hospital, 1884) says that non-restraint means not only close attention to bodily conditions and wants, but it takes cognizance of the peculiar tastes, habits, and idiosyncrasies of the patient. It diverts the morbid fancies into healthy channels of thought and feeling. It relieves the ennui, begotten of idleness, by healthful and congenial occupation; and it dissipates despair and gloom by well-timed and appropriate diversion. There is, in fact, no act of the patient's life, however trivial, that does not come under the notice of the efficient nurse; and it is only by the closest attention to these details that the best

results of moral treatment are to be secured. It must be plain, then, that any system of management that does not recognize and enforce all of these fundamental principles of good nursing, must necessarily be defective. Something over two years ago, he determined to give the system a fair trial in the wards of the Alabama Insane Hospital. Like most of his *confrères* in other well-managed hospitals, he had for many years past resorted to mechanical restraint only in exceptional cases, and a patient confined by either camisole or leathern mittens was a rare sight in our wards. But, becoming convinced that the system was wrong in principle, and injurious in its results upon both the patients and those who had the care of them, he concluded to abolish it entirely. He desires now, after a somewhat extended trial of the system, to record his unqualified conviction of its great value and perfect practicability in the management of the insane. It is gratifying to be able to state further that he is fully sustained in this opinion by every physician, officer, nurse, attendant, and employé of the hospital. If, indeed, he should attempt to describe in detail all the advantages that have followed the suppression of mechanical restraint in this hospital, this report would be extended beyond reasonable limits. He can truly say that there is scarcely a feature of his general management that has not been favorably modified under its influence. Its effect upon the nurses, in making them kind, patient, and considerate, and upon the patients in making them trustful, respectful, and courteous, is simply marvellous. The complaints of cruelty and injustice, so common in the wards of insane hospitals, have almost entirely ceased to be heard in this institution; and the relations of the patients, nurses, and officers are always of the most pleasant and amicable character. It has been plausibly objected, by those who are opposed to the system, that suicides, homicides, and accidents of various kinds are more likely to occur in the absence of mechanical restraints. He can only say that such has not been his experience, nor that of others who are justified in expressing an opinion on the subject. On the contrary, he has not only enjoyed perfect immunity from any of these predicted evils during the past two years, but it is a notable fact, which is verified by visitors and others who inspect the wards every day that the patients were never more quiet and tractable.

ORBITAL CELLULITIS AND MELANCHOLIA.—Dr. Percy Smith (*Journal of Mental Science*, October, 1885) reports the case of a thirty-year-old melancholiac. The patient on admission was suffering from injury to the head, the symptoms of cerebral concussion replacing those of agitated melancholia at first displayed with the full development of orbital cellulitis, his mental condition improved to a considerable extent, but only to pass into a profound depression concurrently with the healing of the abscess.

HALLUCINATIONS.—Dr. Hurd (Pontiac, Michigan, Hospital for the Insane, 1884, Report) says that native-born patients are less liable to hallucinations. "This is probably due to the fact that the education of native-born citizens is more complete, and their minds are less under the control of fancies about witchcraft, unseen agency, black art, and other supernatural machinery. Certain religious beliefs are apt to lead to the consideration of supernatural manifestations or unseen agencies, and thus pave the way for the development of hallucinations and illusions. Hallucinations of hearing are more common than those of sight, and hearing and sight hallucinations are more common than illusions of hearing and sight. Women are more apt to suffer from them than men. Women also suffer to a greater extent from illusions of visceral and genital sensibility. The latter facts are probably explained by the preponderance of organic or vegetative functions in the female organism. Nature seems to have designed that conception, gestation, and the subsequent nursing of children should be carried on without detriment to bodily health by thus overloading the organic functions of the female. Where mental derangement is developed, these exuberant organic forces play an important part in the unconscious mental activity of the individual, and give rise to disorders of sensation and false mental conceptions. These false impressions, whether of hearing, sight, smell, taste, or touch, are not always isolated. In many instances, deceptions of sight and hearing, and alterations of the gustatory, olfactory, and tactile senses are combined together. As a rule, the more complex hallucinations are present among patients with mental cultivation above the average. An ignorant person is unable to describe clearly or discriminate understandingly between complex illusions or hallucinations. It is highly probable that if all patients were able to describe clearly their hallucinations, it would be found that complex deceptions of the senses are comparatively common. Heredity plays a very important part. In 46 per cent. a hereditary tendency to mental disease was found to exist, in 32 per cent. the facts were unascertained, and in 22 only were insane relatives known *not* to exist. The relations of hallucinatory insanity to different clinical groupings are also of interest. In certain clinical groups a large percentage of patients suffer from hallucinations. In idiopathic and ovarian insanity, 60 per cent. have hallucinations or illusions; in traumatic insanity, 40; in paretic, 36; in puerperal, 33; in insanity of adolescence, 31; in alcoholic and climacteric, 29; and in masturbatic, 28. The percentage of hallucinated individuals in epileptic insanity is not as great as has been supposed. This is probably due to the fact that many cases of epileptic insanity at the time of their admission are too much impaired in mind to give a clear and connected account of hallucinations or illusions. Could all epileptic patients be examined upon this point prior to mental impairment, it would undoubtedly be found that a much larger percentage suffer from hallucinations. It will be noticed that the

more closely the insanity is allied to a neurotic organization or dependent upon an organic cause or produced by actual disease. the more certain are hallucinations and illusions to exist. It is interesting to note that no cases of hallucinatory insanity have been found here prior to the age of fifteen, and that they are most frequent between the ages of thirty-five and forty. It would seem as if disorders of this character were most frequent when the individual had arrived at an age where mental introspection is possible. Prior to thirty years of age, individuals are interested and occupied in the activities of life. Between thirty and forty more opportunity is given for meditation and comparison, and hence in the insanities developing at that time hallucinations and strange impressions seem more common. The existence of hallucinations and illusions does not render the prognosis of mental disease wholly hopeless. Upwards of one in five recover. The fact, however, that nearly four fifths die, or go on to chronic forms of disease, indicates their extreme gravity. Many viseral illusions are connected with disorders of digestion or difficulties in the absorption or assimilation of food. Among epileptics illusions unquestionably arise from an epileptic aura, and are of the nature of true neuralgia. In ovarian insanity, genital illusions are unquestionably due to ovarian irritation, and probably are largely connected with morbid conditions of the ovaries." This last observation is much too strongly put. Hallucinations are, despite these observations, frequent in insanity of children.

PARANOIA.—The Utica alienists, educated by the Guiteau trial, are studying paranoia, but are evidently very much confused, being very badly biassed by *a priori* conceptions of insanity. One of the ablest American clinical alienists, Dr. Hurd, seems to have had no difficulty in grasping in its fulness the German conception of paranoia, which, after all, was fully recognized by Ray and Nichols, under the title of "Imbecility of the first grade," a conception precedent to the German one, and lost sight of through the dominance of the philistines of the Utica school. Dr. Hurd says (Report of the Pontiac, Michigan, Hospital for the Insane, 1884): "The term 'dementia, monomania' includes a large number of cases in a secondary stage of mental disease. The majority of these persons have passed through its active stages, and have regained a degree of physical and mental vigor. Their minds, however, are enfeebled and they retain systematized delusions in a particular direction. A careful study of the cases included under this head shows that all patients suffering from monomaniacal delusions are not necessarily victims of marked dementia. In a few instances at least, the dementia does not seem to have developed from a pre-existing attack of mania or melancholia, but to have arisen primarily from the native constitution of the patient's mind and as a diseased development of a neurotic organization. The form of disease of this class of cases has been called by the Ger-

mans primary paranoia, a term which has been translated into English 'primary monomania.' It has heretofore been customary to regard them as victims of secondary dementia, and to suppose that in each instance a preceding attack of mania or of melancholia had been destitute of active symptoms and had not been recognized by the friends. A painstaking analysis of several cases, classed as dementia, monomania, shows that in some the morbid phenomena developed primarily.

"In view of the fact that cases of this character are comparatively infrequent, it is deemed proper to give a detailed history of two. The first, a male, twenty-seven years of age, a farmer, inherited from an eccentric, improvident, and unsuccessful father, and an insane mother, a neurotic organization. He grew up with a turn for mechanical inventions, and was studious and thoughtful beyond his years. One of his inventions, at least, proved valuable and has been generally adopted. At the age of twenty-four, without any antecedent excitement or depression, he first attracted attention by writing a letter to a sister, in which he used blood from his arm instead of ink. After he had finished it he smeared the page with blood, and stated that he wished to see rivers of it flow. Almost immediately he became unsettled and devoted himself to erratic inventions and the study of the Bible. He believed himself sent by God to preach, and went about dressed in a fantastic suit of velvet, armed with a two-edged sword, preaching and distributing tracts, which were largely composed of Scripture texts and enigmatical, incoherent explanations of them. He believed himself to be a prophet and 'the man on the white horse,' spoken of in the book of Revelation. He also fancied himself to be sent upon a special mission to convert and restore fallen women. With these extravagant delusions there were mingled delusions of suspicion and persecution. He believed himself to be defrauded of property and persecuted without cause. He was finally arrested and lodged in jail because of frequent threats to kill a relative, and then brought to the asylum. He came with a Bible under his arm, and announced that he was persecuted 'for righteousness sake.' He said that he had done no violence to any person, and had been guilty of no unjustifiable threats; acknowledged that he was eccentric, that he had worn a fantastic suit, and carried a two-edged sword in order to attract attention, but that the latter paraphernalia were 'a powerful agency,' and calculated to attract attention and 'do good.' He threatened his sister and her husband because they ill-treated his mother, and he destroyed property and threw articles from the house because he desired to get possession of his own. He had broken no law, and 'the joke had gone far enough.' He knew more about the Bible than any other person, and through careful study, was better qualified to teach the Scriptures than any divine. He spoke of the rottenness and hypocrisy of the church, and declared that several immoral women were church members at home. He declared that he had received much immoral solicitation, and had witnessed lewd con-

duct on the part of several church members. When asked if his conduct was not calculated to cast doubts upon his sanity, he replied that martyrs in all ages had been persecuted for righteousness sake. He turned to the 49th chapter of Genesis and read as follows: 'Judah, thou art he whom thy brethren shalt praise; thy hand shall be in the neck of thine enemies, thy father's children shall bow down before thee. Judah is a lion's whelp; from the prey, my son, thou art gone up: he stooped down, he couched as a lion, and as an old lion; who shall rouse him up? The sceptre shall not depart from Judah, nor a law-giver from between his feet, until Shiloh come; and unto him shall the gathering of the people be.' He claimed to be 'Shiloh,' and to prove it, quoted from the 19th chapter of the Revelation: 'And I saw heaven opened, and, behold, a white horse, and he that sat upon him was called Faithful and True, and in righteousness he doth judge and make war. His eyes were as a flame of fire, and on his head were many crowns, and he had a name written that no man knew but he himself, and he was clothed in a vesture dipped in blood, and his name was called the Word of God. And the armies which were in heaven followed him upon white horses, clothed in fine linen, white and clean. And out of his mouth goeth a sharp sword, and with it he should smite the nations, and he shall rule them with a rod of iron, and he treadeth the wine-press of the fierceness and wrath of Almighty God. And he hath on his vesture and on his thigh a name written, King of kings and Lord of lords.' His coming here was prophesied, and read from the 20th verse of the 2d chapter of the Revelation to the close of the chapter. The adulterous woman referred to above he was shown in a vision by an angel of the Lord one year ago. He had offered himself in marriage to seven lewd women in succession without knowing their character, and had been rejected by each of them on account of his religious belief, but afterwards received a vision from the Lord which showed to him their true character. He also read numerous quotations from the Old Testament prophets, which announced his coming and imputed to him supernatural powers and a divine mission. Notwithstanding these extravagant conceptions of his own character, he is oftentimes gloomy, depressed and unhappy. He believes himself to be a martyr and a persecuted person, and is fearful of personal injury. He employs himself to some extent usefully, and engages under protest in games of cards and the like. It will be observed that his extravagant delusions are not those characteristic of paretic dementia, nor, on the other hand, are his delusions of persecution like those of melancholia. He is persecuted because of his distinguished character, not because he deserves such treatment. Were he a paretic, he would discover no difficulty in destroying his enemies; were he suffering from melancholia, he would accept his so-called imprisonment as a proper reward for ill deserts. This patient will probably reach what has been termed by German writers the 'stage of transformation,' when his ideas of persecution will no longer cause him dis-

tress, and he will become fully absorbed in the contemplation of his own divine mission and filled with extravagant schemes for the propagation of his religion.

"A female patient illustrates more fully all the stages of this form of disease. She came from a respectable and long-lived stock. Both father and mother were very nervous. The father was unsuccessful in business and possessed little energy. Her mother was active and energetic, but had little endurance, and died at the age of sixty, from apoplexy. The patient was active, energetic, and capable, but always peculiar. Her married life was unhappy, and she was divorced from two husbands at intervals of many years. She had always been jealous and irritable, but a conscientious worker, a fond mother, and a devoted wife. At the climacteric, when much reduced in health, she suddenly developed a delusion that she was watched and followed by suspicious persons. She first noticed these suspicious personages while waiting in a railway station, and perceived that they cast meaning glances at her. After she returned home she saw the same persons loitering about the little village where she lived. To ascertain their intentions, she planned a journey to an adjoining town where she formerly lived. There she saw the same mischievous characters dogging her footsteps from house to house. Becoming alarmed, she telegraphed for her son to accompany her home because she feared to undertake the journey alone. When she again reached home she was still annoyed by the attentions of the same persons, and developed the additional delusion that they were scattering powder about the streets to blow her up. Becoming wakeful, restless, and loquacious, it was necessary to place her in the asylum. After her restlessness and excitement had been allayed by the regularity of asylum life, she developed a delusion that she was the daughter of a wealthy New York merchant, and ingeniously constructed a theory to account for her apparent neglect by her father. She believed that her mother had been secretly married to this gentleman previous to her marriage to her reputed husband. The marriage, however, had been concealed for family reasons and she had been brought up as the apparent daughter of the man whose name she bore. She accounted for her not being molested by any person until late in life by the declaration that there was no motive for destroying her until after the death of her true parent. Her rightful claims to his large property rendered her a dangerous person who must be put out of the way, and she had been followed about and persecuted in consequence. During several years of asylum treatment she was restless, wakeful at night, apprehensive and much distressed, but never maniacal or depressed. After a time she developed strong religious delusions. She fancied herself about to become the mother of another Saviour. She had great distress of mind and extreme unwillingness to accept the responsibility thus thrust upon her, and spent her days in reading the Scriptures and her nights in prayer. She had trance states, during which she saw her physician, the Saviour, and other important

personages, and received divine messages. She had at times active delusions of persecution, suspected poison in her food, perceived noxious vapors in her room, and thought herself surrounded by enemies who were determined to take her life previous to the birth of her child. After several months she learned in a vision, that her child had been miraculously born without her knowledge, and that she was henceforth to occupy a high position. From this time her delusions of persecution ceased to distress her and she became cheerful and hopeful. She now spends much of her time in reading and writing. She displays a pleasant interest in her associates, is kind to her children and grandchildren, and her letters and conversation are coherent, pleasant, and natural. When questioned about her delusions, she asserts calmly, and without trace of excitement, her divine character and proclaims her divine mission. The tumults, anxiety, and distress of mind, which accompanied the stage of transformation have passed away, and she now bids fair to live a quiet, peaceful, and uneventful life the remainder of her days. J. G. KIERNAN.

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e.—THRAPEUTICS OF THE NERVOUS SYSTEM.

MENTHOL AND ITS ACTION.—The results of Dr. A. Schmidtz's experiments (*Centralblatt für klin. Med.*, Aug. 8, 1885) confirm the statements of McDonald and others, regarding the local anæsthetic properties of peppermint-camphor. Oil of peppermint is a mixture of a fluid hydro-carbon, menthen, $C_{10}H_{16}$, and of menthol, $C_{10}H_{19}OH$ the latter being also known as peppermint-camphor. The German, English, and American preparations of oil of peppermint contain a smaller portion of menthol than do the Chinese and Japanese, and consequently the latter preparations are solid and crystalline at ordinary temperatures. Menthol has long been used by the Chinese and Japanese for the relief of headache and especially toothache. Delioux de Savignac, McDonald and Rosenthal, have described the analgesic properties of the drug when locally applied. The effects produced a few years ago with the headache-sticks (Japanese ?) suggested to Schmidtz the idea of studying the physiological action of menthol. His experiments were made on animals and men, and finally he used it therapeutically. He obtained the following results : A frog's leg dipped in a weak solution of menthol in alcohol and water became completely anæsthetic after ten minutes. In warm-blooded animals the anæsthetic effect appeared more quickly and was more marked. A one per cent. alcoholic solution diminished the sensibility after a few minutes, but it required a ten per cent. solution to produce an effect equivalent to that of a one per cent. cocaine solution. The effect, however, of menthol lasted longer than that of cocaine. Irritation and injection of the cornea followed. The anæsthesia produced by pure crystals of menthol upon the cornea lasted from one half hour to three hours. Anæsthesia of the nasal mucous membrane was also produced after ten minutes by a ten

per cent. solution. A solution made with olive oil, though not followed by so much irritation, had less anæsthetic effect. Applied to the human conjunctiva, menthol causes severe pain, photophobia, and effusion of tears. The pain lasts a quarter of an hour, then gives place to a feeling of coolness, which in turn is followed by that of warmth. The conjectival injection lasted several hours. A similar local anæsthetic effect is produced by applications to the tongue.

Therapeutically S. obtained good results by local applications in migraine and superficial neuralgias. As, in applying it to the tongue and mucous membrane of the mouth, it was noticed that profuse salivation resulted, S reasoned that it would be useful given internally to increase the secretion of gastric juice and to thin the sputa. In this he was not disappointed, as it worked like a charm. Unfortunately cases are not given. The following conclusions are drawn : 1. Menthol is an anæsthetic for such nerve-terminations with which it can come directly in contact. 2. It especially stimulates the secretory nerves.

On the Incompatability of Chloral-Hydrate and Alcohol in the Presence of Potassium Bromide. *Boston Med. and Surg. Jour.*, vol. cxiii., 4.—Prof. F. H. Markoe received a bottle containing the following mixture :

℞ Bromid. potass.,
Chloral hydrat. . . āā ʒ iij.
Tr. opii et camph.,
Syr. zingiber. . . . āā ℥ iss. ♏

It was sent to him for investigation, as the physician who had prescribed the medicine claimed that the druggist had made a mistake. The mixture consisted of two layers, a clear dark-brown liquid floating upon a light-colored dense liquid. On investigation Markoe found that the supernatant fluid consisted of chloral alcoholate, which was formed by the union of the chloral with the alcohol in the paregoric. The bromide was contained apparently in the under layer of liquid. The danger of prescribing chloral with alcoholic preparations from this is obvious.

The Abuse of Bromide of Potassium in the Treatment of Traumatic Neurasthenia.—Page (*Med. Times*, April 4, 1885), believing that the symptoms following spinal concussion are in great part of a neurasthenic nature, condemns the prolonged use of bromide on the ground that it only adds to the depressed condition of the nervous system already existing.

The Physiological Action of Convalleria on the Nervous System.—Dr. Steller contributes (*Therapeut. Gaz.*, Sept. 15, 1885) the results of his experiments with the active principle of the lily of the valley on frogs. The principal effect which

he obtained was a loss of reflex activity, "of complicated origin, but no doubt dependent primarily upon the depression of the sensory portions of the cord." The experimenter concludes that the results of his experiments show that the drug does not possess much influence on the nervous system in general, and hence the drug can be pushed in disease of the heart "without fear of the complication of any effects on the nervous system." Though these conclusions may be correct, still the experiments seem to be open to criticism, and, in particular, because they have only to do with the frog and mostly with lethal doses, and hence inferences as to the effect of therapeutic doses on *man* are hardly sound.

SALICYLATE OF COCAINE FOR TRIGEMINAL NEURALGIA.—Dr. Max Schneider reports (*Allg. med. Central-Ztg.*, 1885, 53) a case treated successfully by subcutaneous injections of salicylate of cocaine. The patient, a woman, was attacked for the third time. The effect of the treatment was most startling: 0.4 gm., injected into the cheek, caused the total cessation of pain, without any ill effects.—*Centralbl. für Nervenheilkunde*, etc., 1885, No. 19.

PARTHENIN IN MALARIAL NEURALGIAS.—Neuralgias of malarian origin will, according to Dr. Esperon in a Havana medical journal, often yield to a medicine named *parthenin*, extracted from an indigenous plant called *escola amarga*, bitter broom. He describes cases in which all the ordinary drugs were useless, or produced only temporary benefit, while parthenin, as soon as it was given, gave great relief, and was followed by a lasting cure. It is given in pill form, two grains being divided into twelve pills, and one given every two hours.—*Med. Times*, Aug. 8, 1885.

THE RESULT OF STRETCHING THE FACIAL NERVE FOR FACIAL SPASM.—Zesas has collected nineteen cases, including two of his own (*Wien. med. Wochenschr.*, 1885, Nos. 27, 28). Of these there was in three cases complete cure; four cases, marked improvement; ten cases, negative results. In two cases the result was unknown. Temporary improvement was observed in ten. —*Neurolog. Centralbl.*, 1885, No. 17.

This seems to be a somewhat better showing than that of other tables. See previous numbers of this JOURNAL.

MORTON PRINCE, M.D.

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New York State Medical Association. Transactions, I., 1884.

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Rationalism in Medicine, by William Thornton. Boston, 1885.

The Blot upon the Brain. Studies in History and Psychology, by William W. Ireland. New York : G. P. Putnam's Sons, 1886.

Psychiatry : A Clinical Treatise on Diseases of the Fore-Brain, etc., by Theodore Meynert, M.D., Professor of Nervous Diseases, and Chief of the Psychiatric Clinic in Vienna. Translated (under authority of the author) by B. Sachs, M.D. Part I. : The Anatomy, Physiology, and Chemistry of the Brain, New York and London : G. P. Putnam's Sons, 1885.

Nervous Diseases, by S. G. Webber, M.D. Boston, 1885.

v. Ziemssen : Electricität in der Medicin, II. Berlin, 1885.

Tabes Dorsalis Illusoria, von Prof. P. J. Kowalewsky (Charkoff). Separat-abdruck aus dem *Centralblatt für Nervenheilkunde, Psychiatrie*, etc., viii. Jahrgang, 1885, No. 15.

Avena Sativa in the Treatment of Opium Addiction—A Therapeutical Fraud, a Delusion, and a Snare, by J. P. Mattison, M.D., Brooklyn.

The Therapeutics of High Temperature in Young Children, by William Perry Watson, A.M., M.D. Reprinted from *Archives of Pediatrics*. Sept., 1884.

Note on a Form of Post-Neuralgic Insanity, by C. H. Hughes, M.D. Reprint from *Alienist and Neurologist*, October, 1885.

Du Caféisme Chronique, par le Docteur Octave Guelliot. *Reims*, 1885.

FOREIGN EXCHANGES.

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Archiv. fuer Psychiatrie und Nervenkrankheiten.
Allgemeine Zeitschrift für Psychiatrie.
Berliner Klinische Wochenschrift.
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British Med. Journal.
Canada Medical Record.
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Centralblatt für d. Nervenheilk., Psychiatrie, etc.
Centralblatt für Klinische Medicin.
Centralblatt für Chirurgie.
Deutsche Med. Wochenschrift.
Deutsche Arch. f. Geschichte der Medicin.
Deutsche Medizinal Zeitung.
Dublin Journal of Med. Sciences.
Edinburgh Med. Journal.
L'Encéphale.
Gazetta degli Ospitali.
Gazette des Hôpitaux.
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Hygeia.
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Journal de Médecine et de Chirurgie Pratiques.
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Journal of Physiology.
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London Med. Record.
Medical Times and Gazette.
Mind.
Neurologisches Centralblatt (Mendel).
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Progrès Médical.
Revue de Médecine.
Revue des Sciences Médicales.
Rivista Clinica.
Rivista Sperimentale di Freniatria.
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