pregnant (first pregnancy) and increased in severity for four months, at which time she miscarried. Following the miscarriage there was a slight improvement for a few weeks, then the symptoms remained stationary for six months, finally disappearing under treatment, recurring however, during a subsequent pregnancy several months later.

The symptoms did not differ from those as originally described by Bernhardt and Roth, except for the presence of a line of tenderness upon pressure along the upper part of the thigh, corresponding to the course of the external cutaneous nerve. This was considered as additional evidence pointing toward the "neuritis theory" held by Bernhardt.

Treatment consisted of rest, hot fomentations locally and aspirin internally. Galvanism was applied with the cathode over the lumbo-sacral spine and the anode over the affected area.

Presentation of a "Case of Myopathy of Unusual Distribution."

W. H., female, white, aged 17. A patient from the neurological dispensary of the Jefferson Hospital. Family history negative as to myopathy, neuropathy or tuberculosis.

Previous personal history negative except for a severe attack of chorea when nine years of age. The onset of her present symptoms had been gradual, attention having been first attracted about two and one-half years previously to a deformity of the front of the chest, and later to a flaring of the right scapula. These were due to a wasting of the muscles underlying the right scapula, which allowed that bone to slip from its anchorage, and to override the shoulder upon any attempt to elevate the arm or bring it forward. The arm could not be raised above the level of the shoulder. During the past six months the same symptoms had appeared to a slight degree upon the left side. The deltoid, biceps, triceps and intrinsic muscles of the hands were all unaffected. There was no wasting of the muscles of the lower extremities and no pseudohypertrophy. There was no history of pain or trauma and no fibrillation. Electrical reactions and tendon reflexes were normal. The case was differentiated from disease of the long thoracic nerve, chronic anterior poliomyelitis and congenital elevation of the scapula.

NEW YORK NEUROLOGICAL SOCIETY

March 2, 1909

The President, DR. J. RAMSAY HUNT, in the Chair

A CASE OF HYSTERICAL MUTISM

By William M. Leszynsky, M.D.

The patient was a man 52 years old. Prior to his present disorder he had always enjoyed good health. Seven months ago, after some financial losses, his speech became stammering for a day or two and then was completely lost. Since that time he had not spoken. There had been no recurring utterances, exclamations nor jargon. His hearing was perfect and he understood what was said to him and promptly obeyed all commands. He was able to communicate in writing. He wrote legibly, correctly and with good sense, and also to dictation. He read (visually), understood what he read and copied correctly. He named all objects correctly by writing. He was right-handed.

When instructed to open his mouth and protrude his tongue he made the most energetic efforts and finally succeeded in separating his jaws about one inch. When Dr. Leszynsky attempted to open the jaw by force, it was voluntarily opened to a normal degree. The tongue and facial muscles were apparently normal. He swallowed normally, his appetite was good and he masticated his food. The pharyngeal reflex was active and there was no anesthesia. No aphonia. He could enunciate all vowel sounds and under suggestion and persuasion succeeded in saying "p" and "b."

The pupils, ocular motility, corneal and lid reflexes and eye grounds were normal. The upper extremities were normal excepting a slight tremor in the outstretched hands. There was no static ataxia. In walking there was a slight extensor rigidity in the right lower extremity, with intact muscular power and resistance, exaggerated knee-jerk and ankle clonus. The plantar and cremasteric reflexes were normal. There was slight ankle clonus on the left side and universal analgesia.

There was no evidence of renal or other visceral disease, and the blood pressure was practically normal. Dr. Leszynsky said he had etherized the man with the idea that it would restore his speech, but without success. He regarded the case as one of hysterical mutism or perhaps a subcortical type of aphasia.

A CASE FOR DIAGNOSIS

By W. M. Leszynsky, M.D.

The patient was a man, 28 years old, who two years ago began to have slight pain in the dorsal region, extending to the right hypochondrium. The pain was somewhat sharp in character, and lasted about an hour and a half. Similar attacks recurred about three or four times, the pain increasing in intensity and duration. Six months ago the pain became more severe, burning in character, and radiating from the vertebræ to the lateral portion of the abdomen and below the right nipple. During the past four weeks there was a "burning" pain, almost continuous, below the nipple line. There was no girdle sensation, but the pain at times extended to the upper third of the right thigh anteriorly. No pain in the back or elsewhere. No bladder nor rectal symptoms. No history of injury to spine. No alcoholism nor syphilitic infection. The bowels acted normally. His appetite was good and he slept well.

Twelve years ago the patient had an eruption over the right side of the back and abdomen, extending to the knee. This was not accompanied by pain. There were numerous pustules, which were lanced. He continued at work as cashier in Austria during this attack, which lasted three weeks. Three years ago he was kicked by a horse, producing a compound fracture of the right tibia. For this he remained in the Presbyterian Hospital about three months. His mother died at the age of 54 from some abdominal disease. His father was living and had some pulmonary affection. His brothers and sisters were in good health.

Examination: Heart, lungs and abdominal viscera presented no evidence of disease. The urine and blood were negative. Pupils and eye grounds normal. The vertebral column was normal; there was no tenderness nor pain on pressure or percussion over the vertebræ or in the course of the intercostal nerves. The epigastric, abdominal and cremasteric re-

flexes were absent on the right side; normal on the left. The abdominal muscles were slightly wasted on the right side, with qualitative and quantitative decrease in faradic irritability. There was an area of analgesia, with loss of temperature sensibility and preservation of tactile sensibility extending anteriorly from about four inches below the nipple to about four inches below the umbilicus, and posteriorly from about the seventh thoracic vertebra to the level of the spine of the ilium. There were no other disturbances of sensibility. The patient's gait and station were normal. The muscular power and resistance in the ilio-psoas and other muscles of the lower extremities were normal. The right knee-jerk was exaggerated and slight ankle clonus was present. The plantar and Achilles reflexes were normal and the examination was otherwise negative.

Dr. Leszynsky, in presenting the case, thought the diagnosis rested between an unusual type of syringomyelia and an extra-medullary spinal tumor.

Dr. M. Allen Starr said the second case shown by Dr. Leszynsky impressed him as being one of syringomyelia. The dissociation of sensation, the preservation of the tactile sense and the loss of temperature and pain senses were all suggestive of a lesion in the central gray matter near the posterior commissure. The slight muscular atrophy on one side of the body also strengthened that diagnosis. The destruction of the gray matter of the cord seemed to be an adequate explanation of the symptoms present. In syringomyelia, the tendency of the lesion was to involve quite a number of segments of the cord, and while in the majority of cases it was located in the cervical region, yet it might involve the dorsal and lumbar regions. In this case, the lesion apparently extended from the sixth dorsal segment down to the first lumbar. The pain might be explained by an irritation of the posterior nerve roots at their termination in the gliomatous tissue, and the presence of pain was not necessarily an evidence of its not being a syringomyelia involving one-half of the cord. The exaggeration of the knee jerks might be attributed to the breaking down of the tumor, and involving the lateral column of the cord.

Dr. Starr said he had come to regard syringomyelia as rather more common than was formerly supposed. Probably seven or eight cases were seen at the Vanderbilt Clinic every year, and they were much more frequent than multiple sclerosis.

A CASE OF THROMBOSIS OF THE LEFT ANTERIOR SPINAL ARTERY IN THE MEDULLA OBLONGATA

By I. Abrahamson, M.D.

This patient, when he was originally shown to the Society, on April 7, 1908, presented the characteristic syndrome of a thrombus in the left posterior inferior cerebellar artery, *i. e.*, a patient with a chronic nephritis had prodromata consisting of left-sided headache, vertigo, vomiting, mental confusion, etc.; then a gradual development of ataxia, falling to the left, dysphagia, aphonia and numbness of the left face. Examination showed dissociated sensory disturbances over the left trigeminal distribution, and over the right side below the distribution of the fifth nerve; sympathetic enophthalmia, left; ataxia, left; very slight right hemiparesis; paralysis of the left palate and larynx; anesthesia of the same; irregular heart action, etc.

The patient made only a partial recovery, the sensory disturbances persisting, but to a less degree and extent.

In July, 1908, without prodromata, and without loss of consciousness, the patient was found paralyzed in the left and upper extremities, the tongue and neck. The throat was filled with mucus. There was an elevation of temperature, and rales over the lungs. When Dr. Abrahamson saw the patient about 24 hours later a typical left hemiplegia, exclusive of the face, was found, including the left tongue and the left sterno-cleido-mastoid. Sensory disturbances over the left face and right half of the body, as before. No astereognosis in left hand.

A diagnosis of thrombosis of the terminal branch of the cerebral, just before its junction with the right anterior spinal, was made. Whether this was a continuation of the old thrombus of the left inferior cerebellar, including now the anterior spinal, or a separate thrombus, could not be established at present.

The rarity of occlusions of this vessel seen and recognized clinically, and its sequence to a plug in the posterior inferior cerebellar artery made the case an extremely interesting one.

SUB-DURAL AUTO-DRAINAGE IN INTERNAL HYDROCEPHALUS

By Alfred S. Taylor, M.D.

In this paper Dr. Taylor said that one of the sequelæ of cerebro-spinal meningitis was internal hydrocephalus. In this the chief damage was the result of the mechanical distension from within outward of the brain, which interfered with its circulation and with the developmental processes which were particularly active in young children, and which caused certain pressure atrophies, notably in the optic chiasm. For the relief of this distension various means had been tried, such as tapping, which gave only temporary relief, while repeated tapplings were apt to be followed by infection, and permanent external drainage had almost invariably been followed by infection and death.

Sub-dural auto-drainage had a number of advantages over other methods: It led the ventricular fluid to the subdural space, where it should normally circulate and be absorbed. There was no chance for infection excepting at the time of the operation. The drainage was constant and permanent in successful cases. The wound was closed tight, so that there was no troublesome fistula, and there was no disfiguring infiltration of the soft tissues.

The technique of the operation, as first described by Dr. Taylor in *The American Journal of the Medical Sciences*, August, 1904, was briefly as follows: It consisted in turning down an osteoplastic flap just above and behind the right ear, turning down a smaller flap of dura, and inserting one end of the drain through the second temporo-sphenoidal convolution into the ventricle, and slipping the other end beneath the dura downward toward the great lymph spaces at the base of the brain. The drain consisted of 40-day chromic catgut, surrounded by Cargile membrane. The wound was closed tightly by layer sutures.

Dr. Taylor then reported in detail a case referred to him by Dr. J. F. Terriberry, in which he had resorted to this method with very satisfactory results. There was marked improvement in the patient's mental and physical condition, as well as in the vision. Fourteen months after the operation, the child died of gastro-enteric disease.

Dr. Taylor reported the use, in a more recent case, of a vein from the father's arm as a drain between the ventricle and the subdural space. At the end of a week it seemed likely that the vein had retained its vitality for there was no undesirable reaction.

Dr. L. Pierce Clark said he had seen several cases of chronic idiopathic internal hydrocephalus where this operation of sub-dural auto-drainage had been done, and these cases did not lead him to believe that the patency of the canal had been fully maintained. With the modification suggested by Dr. Taylor, namely, using a vein for drainage purposes, he thought that better results would be obtained. The practical value of the operation, however, must always be limited. It is a mistake to think of chronic internal hydrocephalics having anything more than a very limited range of intelligence. Accounts of geniuses who were or ever had been truly hydrocephalic are to be looked upon as spurious. Rachitic enlargements of the head are often thought to be truly hydrocephalic, but this is not really the case. The criteria of more accurate diagnosis ought to clear this continued source of error in medical writings.

The President, Dr. Hunt, said that this condition is not always easily recognized, was brought home to him by a case recently seen at the New York Hospital. An 18 months old child had passed through an attack of acute cerebro-spinal meningitis, some months before, but the rigidity of the neck and limbs persisted. An examination of the cerebro-spinal fluid at this time was negative both as to cellular elements and microorganisms. It was assumed that the microbic process was over, and that the continuation of the symptoms was due to inflammatory exudate on the surface of the brain and cord. There was no increase in the size of the child's head, the fontanelles were not bulging, there was no separation of the sutures, and the optic discs were normal, so that internal hydrocephalus was excluded. The child died, and at the autopsy, in addition to a considerable amount of "soapy like" exudate over the base of the brain and the spinal cord, there was found a very well-marked internal hydrocephalus.

Dr. J. F. Terriberry, referring to the case which Dr. Taylor had reported in detail, said that he saw the patient four or five months after he was last seen by Dr. Taylor. At that time the improvement in the symptoms had progressed to such an extent, and the child's aunt was so well satisfied, that she wished to have a second operation done. The child subsequently disappeared, and he was unable to report regarding its final condition.

Dr. Terriberry said that in the current (March, 1909) number of the *Annals of Surgery*, Dr. Russell S. Fowler reported three cases of internal hydrocephalus upon which he operated very recently. In two of these, after determining that there was free communication between the ventricles and the spinal cord, he made a spinal peritoneal anastomosis with a silver tube by the Cushing method. In one of these there was considerable improvement, and the disease seemed to be arrested. In the other, death occurred ten hours after the operation. In the third case there was no communication between the ventricles and the spinal cord, due to adhesions around the base and cerebellum. While attempting to free these the child suddenly expired.

Dr. Terriberry said that in spite of the high mortality that operative interference gave in these cases, we should bear in mind that these children were practically useless. The mortality of the operation at present ranged between 60 and 70 per cent.

Dr. B. Onuf said we should be rather guarded in our statement that these patients were useless members of society. A considerable degree of hydrocephalus was compatible with a fair degree of intelligence.

THE PRESENT STATUS OF THE SERUM TREATMENT OF EPIDEMIC CEREBRO-SPINAL MENINGITIS

By Simon Flexner, M.D.

Dr. Flexner spoke on the criteria of the action of the anti-meningitis serum prepared by Dr. Jobling and himself and showed that the administration of the serum quickly reduced the number and destroyed the viability of the diplococci, reduced the period of illness, increased greatly the number of cases terminating abruptly by crisis, tended to suppress the chronic form of the disease, and then reduced the mortality of the affection. An analysis of 523 cases gave a gross mortality of 29.6 per cent. The fulminating cases are not excluded from this tabulation. In regard to age, the mortality was lowest in the group between five and ten years, where it fell to 15.4 per cent. It was highest in the group between one and two years, as would be predicted from the known high mortality of the disease in infants. But when the cases in this group were analyzed according to the period of the first injection of the serum, an astonishing result was obtained: the mortality in 11 cases injected in the first three days was 9 per cent., and of fifteen cases injected from the fourth to the seventh day, 21.1 per cent. These figures, he thought, possessed considerable significance. Excluding the age group of one to two years, the highest mortality was found in the age group between fifteen and twenty years, which was 31.7 per cent., and 20 years or over, which was 39 per cent. Contrary to what had been observed in the other groups, the highest mortality in these two groups was among the cases treated in the first to the third day period. This was in part explained by the occurrence in these groups of a higher proportion of fulminant cases of the disease, but whether or not still other causes did not contribute to the discrepancy they were not at present prepared to say. The subject was one that was now claiming their attention. It had already been alluded to in one of their previous publications, wherein it was pointed out that the high mortality among these ages occurred among cases treated singly, namely, by physicians having had little experience with the use of the serum.

Dr. Henry Koplik said the subject had been covered so thoroughly by Dr. Flexner that he would simply limit his remarks to one phase of it. While it was impossible, in the absence of any epidemic, to say what the serum would do in cerebro-spinal meningitis, and while it was too early to draw any conclusions, still he thought there was no doubt that it had already accomplished something. Many remedies had been tried in this disease, and had proven absolutely valueless, but that was not the case with the serum. It had a distinct, active influence on the course of the disease. A day or two after its injection there would be an entire change in the characteristics of the cerebro-spinal fluid, together with a great diminution of the number of bacilli, or sometimes even their entire absence. The serum apparently exerted a direct effect on the microorganisms of the disease; under its influence they diminished in number and the purulent cases rapidly cleared up. On the other hand, there were one or two cases—probably exceptional ones—in which the serum failed to exert any effect

on the number of the microorganisms or the character of the cerebro-spinal fluid. The speaker said he had no explanation to offer for this. He could recall two such cases, both in children under two years of age. Still, the mortality in these young subjects had been reduced below 40 per cent. since the introduction of the serum.

Another effect of the serum was that it certainly had shortened the duration of the disease. It many of the cases where it was used, the patients became thoroughly convalescent within a week or ten days. Furthermore, it did more to control the temperature than any other remedy with which he had had any experience.

Speaking of the foudroyant cases, Dr. Koplik said they were only seen during epidemics, and while those that had come under his observation were comparatively rare, of the cases treated by the serum he had 15, of which two died and all above two years of age recovered. Those that died were below one year of age. This certainly was a record hitherto unattainable. One of the cases was a purulent meningitis complicated with lobar pneumonia in both lungs. This case made an uncomplicated recovery.

Dr. B. Sachs thought the supreme test of the serum treatment in cerebro-spinal meningitis was whether any benefit was derived from it in the fulminating cases, either in children or in adults. Personally, the most severe cases he had seen were in very young children and in patients ranging between 14 and 20 years of age. If the serum were a positive cure, it would be extremely important for us to know whether or not it could be relied upon to counteract the effects of the poison, even if administered on the third or fourth day of the disease. While the statistics at our command were still very small in number, we had reason to congratulate ourselves, and particularly Dr. Flexner, upon the discovery of what seemed to be a successful method of treating cerebro-spinal meningitis.

Dr. Leszynsky said he had seen two cases treated by the serum, one a boy of thirteen and the other a man of thirty. Both were very severe cases, and both showed immediate improvement, particularly the boy. Both patients recovered. The speaker said we should not lose sight of the fact, however, that in the course of an epidemic there are abortive cases.

Dr. Ramsay Hunt said he had seen some of the cases at the Babies' Hospital treated with Dr. Flexner's serum. One case in particular that occurred there about six weeks ago seemed to give proof of the value of the treatment. The child, aged 2 years, was brought into the hospital with the history of having been taken ill the day before. The extremities were cold, there was cyanosis and the child showed every evidence of great prostration. Upon lumbar puncture, a turbid fluid was withdrawn which contained the meningococcus. Clinically it was a desperate and apparently a hopeless case; it looked as if the child could only live a few hours. About 50 c.c. of cerebro-spinal fluid were immediately withdrawn, and then 40 c.c. of serum were injected. The child was then infused, stimulated, surrounded with hot bottles and the foot of the bed elevated. On admission the child had no temperature, a fact that was attributed to the collapsed condition. On the following day the patient had cleared up somewhat mentally, and there was some fever. About 35 or 40 c.c. of cerebro-spinal fluid were again drawn off, and a second injection of the serum, of similar amount, given. This was repeated each day for five days, the temperature gradually subsiding, the symptoms clearing at withdrawal of cerebro-spinal fluid and injection of serum, and in

the course of two weeks the child was practically well. Petechiæ and purpuric spots were present on the second day of the disease and this case, Dr. Hunt said, could be regarded as a fulminant type of the disease.

Dr. Flexner, in closing the discussion, said that he was indebted to Dr. Koplik for bringing up the subject of resistant cases. It was true that in a certain number of cases the diplococcus was not influenced by the serum, and it sometimes seemed to develop more numerous after the injections than before. In other instances again the microorganism was apparently uninfluenced for a number of days after the treatment was commenced and then began to diminish in number, perhaps for other reasons than the use of the serum. Cultures of diplococcus from these cases had been taken, and an effort was now being made to discover whether they possessed properties different from those of the common variety, which was so markedly influenced by the serum. It is quite possible that there were strains or varieties of the microorganism that could not be influenced by this serum.

In answer to Dr. Sachs, the speaker said that a number of so-called fulminant cases had been reported as cured under the use of the serum. Whether they were actually fulminant cases or not he could not say. He did know that certain so-called fulminant cases had died promptly in spite of the injections of the serum.

PSYCHO-PHYSICAL INVESTIGATIONS WITH THE GALVANOMETER

By Frederick Peterson, M.D., and E. W. Scripture, M.D.

The authors stated that in 1888 Féré observed that various sensory stimuli produced changes in the deflection of a galvanometer that indicated the amount of current passing through a person. In 1890 Tarchanoff published a paper entitled "Galvanic Phenomena in the Human Skin in Connection with Irritation of the Sensory Organs and with Various Forms of Psychic Activity." Further investigations along these lines were made by Sticker, Sommer, E. K. Müller, Veraguth, Peterson and Jung, Binswanger, Ricksher, Prince, Sidis and Kalmus.

The present investigations were undertaken for the purpose of settling definitely what bodily changes produced the electric effects. The apparatus used consisted of a Weston-D'Arsonval galvanometer of great sensitiveness to which two electrodes were connected. No battery was employed. To perform an experiment the patient put his hands on the electrodes, and thus entered the circuit as a resistance. The large resistance was then adjusted until the galvanometer pointed to zero; it then equalled the body resistance. Any change in the body resistance (coughing, emotion, etc.) upset the equality and caused a deflection of the galvanometer. The method could be made of any desired degree of sensitiveness. The experiments indicated that all mental work was accompanied by some degree of deflection, although intellectual conditions were less effective than emotional ones. Emotional changes, coughing or long breaths, produced merely an increase in the amount of the deflection, but never a change in the direction nor a decrease in the amount. This proved conclusively that the emotions, etc., decreased the electrical resistance within the body and did not generate electricity. These experiments, as well as the work of other investigators, definitely disproved the

view of Sommer that the phenomena were artefacts. It had also been disproved that the deflections resulting from emotions, etc., were due to circulatory changes produced by the mental states, nor were they the result of variations in temperature. The only other supposition was that the deflection was produced by changes in the body resistance. This would explain the increase in deflection in all the experiments reported. The chief resistance of the body lay in the skin, and the effect must be attributed to variations there, and we finally came back to the original supposition that the change was due to the activity in the sweat glands. Change in resistance might be brought about either by saturation of the epidermis with sweat, or by simple filling of the sweat-glands, or by both combined.

Dr. Walter Timme, in referring to the possibilities of Dr. Scripture's experiments, stated that in various individuals under stress of the same emotion, the sweat glands of different areas of the skin would be affected with an increase or decrease of their secretion. In no two subjects would these areas be exactly alike and therefore it would depend entirely upon the relative position of the electrodes as to the character of the deflection of the galvanometer needle. Under the same emotional influences, the needle might show in such various individuals either positive or negative deflections. Indeed, if the electrodes were placed on areas in which the sweat glands were uninfluenced, there might be no deflection whatever. This would also account, probably, for the negative case found by Dr. Scripture.

Dr. Ramsay Hunt, discussing Dr. Scripture's paper, asked if the question of reaction time had also been considered in his experiments. The deflection of the needle follows very closely upon the emotion in some instances.

Dr. Scripture, in closing, said there was an interval of from two to five seconds between the movement of the needle of the galvanometer and the emotion that produced it. It never started instantaneously. In regard to the covering of the hands with shellac or paraffin, the speaker said this must have been defective in the experiments of Sidis and Kalmus. These authors state that the deflections remain the same as without such a covering, whereas an effective covering would have at once cut the current down to zero.

CHICAGO NEUROLOGICAL SOCIETY

January 28, 1909

The President, DR. RICHARD DEWEY, in the Chair

DEMONSTRATION OF A CASE OF MULTIPLE SCLEROSIS, WITH PRIAPISM EXTENDING OVER A PERIOD OF EIGHTEEN YEARS

By Herman L. Kretschmer, M.D.

The patient, Mr. M., aged 67, entered the genito-urinary service of Dr. Louis E. Schmidt at the Alexian Brothers Hospital, January 7, 1909. The patient states that his present trouble began eighteen years ago, at which time he was engaged in packing ice. After working