which by culture on serum agar gave a light growth corresponding very closely to that obtained from gonococci. On retransplantation, however, the cultures died out, and Dr. Larkin said he was therefore unable to positively assert that the encephalitis was of gonococcic origin, although that was his belief.

TUMOR OF THE SPINAL CORD

By William M. Leszynsky, M.D.

The spinal cord had been removed from a woman 49 years of age. For nine years she had complained of characteristic root pains in the course of the left sciatic and anterior crural nerves, and at the end of the fourth year the right lower extremity became similarly affected. Subsequently, there were paresthesia, attacks of transient loss of power in the extremities, and a band-like feeling at the level of the lower thoracic region. Ultimately, she became completely paraplegic, with bilateral foot-drop, loss of patellar, Achilles and plantar reflexes, and incontinence of urine. Hypalgesia and thermoanesthesia extended upward to several inches above the level of the umbilicus. The tactile sensibility was preserved. The Wassermann reaction was negative. Although several lumbar punctures were made, no cerebrospinal fluid could be obtained.

The diagnosis was made of a tumor involving the cauda equina, with secondary implication of the cord. At the operation, which was done by Dr. Charles A. Elsberg, a large tumor was exposed which filled the entire lower part of the spinal canal and extended to and over the conus. Most of the growth was removed within its capsule. No improvement followed, and death took place from exhaustion three months later. At the autopsy, a tumor mass was found involving the cauda and filling the sacral canal. This was a glioma. There were syringomyelic cavities in the lumbar and thoracic regions, chiefly in the anterior portions of the posterior columns, with borders of pronounced gliosis. Both the ascending and descending tracts showed advanced degeneration.

A DEMONSTRATION OF THE SYPHILITIC ORGANISM IN THE BRAIN IN PARESIS

By J. W. Moore, M.D.

Dr. Moore read a paper on this subject and exhibited a number of micro-photographs showing the presence of the *Treponema pallida* in the brain tissues of a parietic. The inception of this work, the writer said, and the preparation and staining of the specimens, were his own, but the credit of having been the first to see the organism belonged to Noguchi of the Rockefeller Institute, to whom he loaned a duplicate set of slides for the purpose of looking for a possible granular form of the spirochete. The findings were published in the *Journal of Experimental Medicine* for February 1, 1913.

Dr. Moore said that from his autopsy service at the Central Islip State Hospital, he had a fairly large number of parietic brains in his possession. Early in 1912 a systematic search of these brains in groups

of twenty and thirty was made for the *Treponema pallidum*. Seventy brains were thus examined, the cases being clinically and anatomically satisfactory as to the diagnosis of paresis. Without entering into the details of the technique of staining, the speaker said the Levaditi silver method was used, with some modifications which might or might not have been important. An unusually favorable degree of staining resulted in many of the specimens. Noguchi was the first to see the organisms, and found them in variable numbers in twelve out of the seventy cases. Immediately after learning of Noguchi's finding, the speaker said he was able to locate the spirochetæ independently and without much difficulty in all of these twelve cases. In about one half of these cases they were very scarce, but in several they were quite numerous and not at all hard to find. The reason why the writer himself had not seen them during prolonged searching was due to a most interesting and significant fact regarding their location. Having in mind the chronic inflammatory changes which one found in paresis, namely, the infiltration of the pia and vessel-sheaths with lymphoid and plasma cells, the writer devoted his attention almost entirely to these localities, particularly as it was here that the organisms had been found in cases of cerebral syphilis, in the narrower sense. In paresis, however, they were apparently absent in the pia and were seldom seen in the immediate neighborhood of the visible vessels. They occurred, instead, deep within the tissue of the cortex. Their motility and penetrating power was known from dark-field observation and from Noguchi's cultural experiments, and it was evidently by this means that they had found their way to the locations where they were encountered. They were almost always in the nerve-cell layers of the cortex; seldom in the marrow and never in the external neuroglia layer, so far as the observations in these few cases went.

Dr. Moore said it was apparent at once how important the knowledge of the existence of the syphilitic organism in paresis was, but he wished to call attention to a few of the more salient points. First, we were afforded a tangible cause for the chronic inflammatory reaction if not for the degenerative changes in paresis, and one which corresponded fairly satisfactorily in location and distribution. It was no longer necessary to offer theories of metabolic disorder, over-production of anti-body, deficiency in lecithin, etc. In the actual presence of the treponema we saw the reason for the serological findings in blood and spinal fluid. The difference between paresis and cerebral syphilis could be conceived to be only one of location and distribution of the organism. When we considered the results of the experiments with vital staining, which showed that fluids introduced into the circulation practically never reached the depths of the brain tissue, or at most only the superficial neuroglia layer, and also that potassium iodide and even antigens and immune bodies did not pass through the meninges, the inefficiency of anti-syphilitic treatment in paresis, whether it be introduced into the circulation or spinal canal, was made clear. The outlook for the future was also rather hopeless, since the organisms lay at a depth at which they apparently could not be reached by ordinary methods.

Dr. Charles B. Dunlap said there was very little to add to the presentation of facts that Dr. Moore had given. After various modifications of the Levaditi silver method Dr. Moore obtained a very clear stain, showing the spirochetæ (*Treponema pallidum*) jet black against a yellow background. The fact that Dr. Moore failed to find the organism in his

earlier examinations was not surprising; they were found not in the mesoblastic tissues, where he had been especially looking for them, but free in the cortical tissues, and one might search through many sections from various parts of the brain and find none.

The results of this work by Drs. Moore and Noguchi, the speaker said, were far-reaching, since they proved (if confirmed—and there was scarcely a doubt that they would be confirmed) what had long been suspected, that the *Treponema pallidum* was the essential causative factor of general paralysis; but this clearing up of the etiology in no way lessened the clinical or anatomical value of the work previously done in connection with this subject. General paralysis would still stand as a distinct variety of cerebral disease, distinct in its anatomical features from other forms, distinct as a clinical group, and distinct in its failure to adequately respond to therapeutic agents and methods heretofore effective in the treatment of ordinary syphilis. While this was so, the demonstration of the *Treponema* rendered the problem of future therapeutic attack much more definite and more hopeful.

A CASE FOR DIAGNOSIS

By William Steinach, M.D.

A man, 69 years old, a native of Germany and a machinist by occupation. He stated that his father, who died at the age of 78 of cardiac disease, had some sort of a tremor. His mother died in childbirth. The patient was the father of eleven children, of whom seven were living, four having died in infancy. One son was a deaf mute, the result of some meningeal trouble following an injury to the head in childhood. Aside from this, there was no history of any nervous or mental disease in the family.

The patient denied lues and had always been temperate in his habits. He had malaria and typhoid fever in childhood. He was well and worked regularly as a machinist in a safe manufactory up to November, 1892. At that time, while bending over, he was struck on the back of the neck by the end of a bar of steel, two inches thick and fourteen feet long, weighing fully 120 pounds. He was knocked unconscious and remained so for fifteen minutes. He was taken to his home, and shortly afterward began to complain of headache, pain in the back of the neck, fatigue on slight exertion and inability to work. About two months later he became depressed and developed suicidal tendencies, when he was sent to Ward's Island, where he remained for six months.

About a year after his injury the patient developed a tremor which became much aggravated on intentional movements. About eleven years ago he developed convulsive attacks which had recurred more or less regularly about three times weekly. He also had daily attacks of transient dizziness. His convulsive attacks were at times accompanied by total loss of consciousness; at other times the loss was only partial. Sometimes he cried out, foamed at the mouth and bit his tongue, and after the more severe attacks he generally fell asleep. There was no aura. During his attacks, as repeatedly observed by Dr. Steinach and others, he alternately stiffened and relaxed. The seizures had rather the character of hysteroid attacks. His memory afterwards was very hazy.