bercles were found in the right pleura, and only there.

Coming now to the practical lesson, it is briefly this: in all cases of pleurisy with effusion, long after apparent recovery, the patient is in danger of pulmonary tuberculosis, and demands all possible hygienic precautions.

MULTIPLE NEURITIS. CASES.¹

BY GEORGE B. SHATTUCK, M.D.,

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ALTHOUGH I find it necessary at the very outset of my remarks this evening, gentlemen, to warn you that I have no new theories to advance, and no really new facts, even, to record, I still shall abstain from going farther in that direction and apologizing for my choice of a subject, and my mode of treating it under these circumstances.

The earliest recognizable and suggestive clinical description of multiple peripheral neuritis, as caused by the use of alcohol, originated in Boston with Dr. James Jackson, in 1822.² Subsequently, the earliest detailed report in this country of cases of multiple neuritis, with accurate specifications as to the anatomical situation and the supposed pathological processes involved in the affection—the earliest, at least, of any with which I am acquainted—proceeded from another Boston source, Dr. S. G. Webber (1884),³ and mainly from cases presenting themselves at the Boston City Hospital. Again, last year, Boston and its City Hospital furnished another contribution to the subject in a paper by Dr. C. F. Folsom, read before the Clinical Section of the Suffolk District Society.⁴ It, therefore, seemed to me not amiss that this subject should be brought up in Boston again, and that the records of the City Hospital should contribute their story from the point where it had previously been left. Nor do I feel that, except, possibly, to a small number of nervous specialists, in doing this I am really in any sense thrashing out old straw. From Dr. Jackson's description of a complex of symptoms which attracted his notice in 1822, the subject received no attention whatever until 1852, when it was taken up by Magnus Huss, of Sweden, in a work on chronic alcoholism. It was not until the end of 1883, as Dr. Allen Starr states in last year's excellent Middleton Goldsmith lecture, the best *résumé* of the whole question of multiple neuritis which has as yet appeared, that the third stage in its history, that of pathological discovery, could be considered as terminating. Not until that recent date, had the symptoms of the affection been recognized as constituting a distinct, clinical picture; had previous hypothetical lesions in the spinal cord been abandoned, and the pathology of the disease been described.

Since 1883, an elaboration of the symptoms, as bearing on diagnosis and differential diagnosis, and of the pathological processes, has been going on. But as late as the beginning of this year, Dr. Starr, whose bibliography would indicate a pretty comprehensive research, mentions finding only about one hundred published observations of cases.

Moreover, I am convinced that still the general

practitioner is not on the lookout for the complex of symptoms, and, in most cases, does not understand or recognize the disease when presenting itself to his observation, as it unquestionably has in the past, does now, and will in the future, with sufficient frequency to make it really important that he should; especially as there is no reason why he should not care for many of these cases himself if he chooses to, and, in any event, he would, at least, know what was the best disposition to make of them, and what to say with reference to the probable course and prognosis. Within a few days a typical case of alcoholic neuritis has come under my care, in which the diagnosis previously made was, "incipient paralysis."

When Dr. Webber read his paper before the American Neurological Association, in June, 1884, he had found the records of six cases without autopsies, and twelve cases with autopsies. In addition to, and distinct from these, he mentions eighteen cases as having entered the Boston City Hospital in the autumn and winter of 1883-84, in his own service, or that of Dr. J. H. Denny—in the nervous service. Of these, he reported four in detail. In May of this year Dr. Folsom reported three cases—two from the City Hospital service. In addition to these two cases, the records show that fifty-one cases of multiple neuritis have been observed and recognized at the Hospital since the summer of 1884. These have all occurred in the nervous service, or been transferred to it, except one case, which entered and died in one of the other services. Of these cases, twenty-nine have been in males, and twenty-two in females; and, I think, in no case has the patient been under twenty years of age, nearly all being between thirty and fifty years old. I have selected eleven cases for reporting in as brief a manner as possible.

The predominating cause of neuritis among such a class of patients as the City Hospital receives, and, indeed, among all those affected by it, I believe, is alcohol, and the abuse of alcohol produces this group of symptoms more often among women than men, though it so happens that a greater proportion of men have entered the Hospital. Phthisis is beginning to be recognized as a not infrequent cause of the affection, and I have, consequently, included some cases. It is difficult, however, to get such illustrative cases as would be desirable among our patients, and, had I had more time at my disposal, I should have looked for them elsewhere. Phthisis is too apt to be preceded or complicated by an alcoholic history. There are two cases in which the underlying cause could not be ascertained, probably owing to the limitations of our means of information, though, in each case, especial pains were taken to get at all sources of information. I am fully alive to the unavoidable imperfections of hospital records, even when carefully revised and controlled. The only case among those recorded breaking out in a sudden, acute, explosive manner, suggestive of an acute disease with an infectious origin was the Case I, reported by Dr. C. F. Folsom in his paper last May. That case followed positive exposure to cold and wet. He was under my care for some months after the expiration of Dr. Folsom's service. I questioned him carefully many times, and I could not evolve any reasonable source of exposure to infection from his statements in regard to his surroundings. There is no other case among those gone over which lends any countenance to the German theory that cases

¹ Read before the Boston Society for Medical Improvement, November 14, 1887.

² New England Journal of Medicine and Surgery, Vol. XI, p. 351.

³ Archives of Medicine, Vol. XII, p. 33.

⁴ Boston Medical and Surgical Journal, Vol. CXI, p. 493.

of multiple neuritis, as such, are due to a specific germ. It may, however, very well be that beri-beri has its specific microbe, and that multiple neuritis is often an accompaniment of beri-beri. Edema and swelling of joints were neither marked nor frequent features of the cases recorded.

Personally, I have not seen any cases which could be traced to such toxic influences as arsenic, lead, sulphide of carbon (to which rubber-workers are exposed), etc.

Brissaud⁵ thinks that acute poisoning by a large amount of arsenic is necessary to produce multiple neuritis with paralysis, that it does not follow chronic poisoning; if such a position were substantiated, it would, of course, simplify the consideration of arsenic as a possible cause in a given case.

I have not gone into questions of differential diagnosis, except incidentally. The distinguishing points between multiple neuritis and acute anterior poliomyelitis, Landry's ascending paralysis, locomotor ataxia — the forms of nervous affections with which it may sometimes, but not often be confounded — have been several times differentiated. I think that the cases I report, if regarded from the combined points of view of history, symptoms, and course, will not be challenged as probably ranging themselves under the category of multiple peripheral neuritis.

I have not dwelt on the question of treatment especially. It is a question whether any given treatment is applicable to any number of cases. In the acute stage, pain must be relieved as it occurs; subsequently, when pain has subsided, electricity, rubbing, and massage are useful in correcting and restoring the paralyzed muscles. Nutritious food, and enough of it nearly always; stimulants almost never; arsenic, salicylic acid, quinine, antipyrine sometimes, are indicated.

In the determination of the electrical reactions of cases in my own service, I wish to acknowledge the attentive assistance of my senior house-officer, Dr. C. F. Carter.

CASE I. *Alcoholic Neuritis; no Phthisis. Two Attacks.* E. M., a male, aged twenty-six years, furniture polisher, single. No specific history. No history of exposure to cold. Uses alcohol "a little." About the first of May, 1883, began to have sharp pains in the feet extending gradually into the calves, knees and thighs. These pains were followed by numbness in the legs and later in the thumbs, loss of power in legs and hands, burning sensation in the feet. After being in bed ten days these symptoms diminished. When admitted to the hospital, July 11, 1883, in Dr. Webber's service, was able to move arms and legs but complained of weakness. Could move feet but little. Paresis of extensors of hand. Sensation good. No noticeable atrophy of arms and legs. No cutaneous reflexes. Patellar reflexes absent. No ankle clonus.

July 13th. No lead line on gums. Complete paralysis of the extensors of the feet. The tibialis anticus and peronei do not react to faradism, extensors of the arm react feebly.

July 31st. Faradism administered every other day. Improving rapidly. Can move feet very well; the muscles react somewhat to faradism.

September 6th. Walks about fairly well, though complaining of some pain in the feet; has difficulty in

raising the toes when walking, the feet being thrown forward and the toes striking the ground first.

Discharged October 30th, at which time he was able to walk as well as ever he could, but the electrical reactions were still diminished. Duration in hospital three and one-half months; total duration six months.

Admitted second time to hospital June. 15, 1885, in Dr. C. F. Folsom's service with symptoms similar to those reported. Had continued the use of alcohol since his discharge.

June 17th. Patella tendon reflex absent; increasing loss of power in grasps of hands; could rise from chair only with assistance; when standing would lean far forward and could not maintain equilibrium with the eyes shut.

June 27th. Extreme sensitiveness to pressure over main nerve trunks of both arms and legs, but no pain on motion.

July 22d. Could walk the length of the ward without assistance. Previously mentioned symptoms diminishing. Discharged from the hospital September 14th, much relieved, and has not been heard of again. Duration in the hospital, two months.

CASE II. *Alcoholic Neuritis with subsequent Phthisis.* M. T., aged twenty-seven years, female, single, domestic, with an unimportant family history. Had been a hard drinker at times and for three or four weeks before admission to hospital, September 5, 1885, in Dr. Folsom's service under care of Dr. Morton Prince. She had had difficulty in walking for several days, and numbness in both legs for two weeks. Absence of the patellar reflex, patches of anaesthesia on the inside of the legs. Walked with difficulty on account of staggering, which she attributed to weakness; complained of pains in the calves. Hand grasps of fair strength, no ataxia of the hands; tremor when extended. Reaction of degeneration in muscles of both legs.

General condition improved slowly up to October 18th, when signs of incipient phthisis were noticed and these developed steadily, but the patient was discharged relieved of the neuritis, January 13, 1886. Duration, five and one-half months.

CASE III. *Alcoholic Neuritis.* M. K., aged thirty years, male, employed in a brewery, loading the teams. A large, strong man, who, up to the beginning of present attack, had enjoyed good health. Had been in the habit of drinking a good deal of beer in the early morning before breakfast, after loading the wagons. Entered the hospital, September 17th, (in Dr. Denny's and Dr. Shattuck's service.) Temperature, 99°, pulse, 72; tongue bright red like raw beefsteak; feet slightly swollen and oedematous; pupils equal, reacting to light and accommodation, slight nystagmus on looking to the right; grasps equal but both weak; knee-jerks and plantar reflexes absent; tenderness on pressure over both posterior tibials; tremor of extended hands. It was learned from patient's wife that he had been sick in bed for sixteen days before coming to the hospital, having lost the use of his legs at the beginning of that period; he had had double vision and been "queer," especially in regard to his memory which was greatly impaired. Was unable to walk or stand when brought to the hospital.

September 27th. Had been somewhat noisy at times since previous record; without knowledge of where he was or how long he had been there; remem-

⁵ Paralyties Toxiques, Thèse. Paris, 1886.

bered nothing of recent or past occurrences; sometimes unable to pass water without being catheterized; tenderness over posterior tibials about the same; unable to stand on feet.

October 7th. At this date could stand with assistance.

October 14th. Mental condition improving slowly; cried like a child and bewailed himself bitterly if left alone in bed with the screens around the bed. Was able to stand without assistance; tenderness over posterior tibials less pronounced.

October 20th. Walked about the ward with a cane.

October 30th. Walked without a cane, could stand easily with his eyes shut; mental condition clearer; patellar reflex still absent; electrical reaction of degeneration in both legs; grasps by manometer right = 86; left = 80.

November 8th. Was improving mentally and physically rapidly. Could walk well, even vigorously. Was anxious to go home and was discharged much relieved. I communicated with his employers and learned that he, the patient, had exhibited unusual stupidity, and inefficiency in his work for about three months before coming to the hospital; that he had lost strength in his feet and legs and been complaining of them for "a year or more;" that he gave up work the last day of August. Used "to drink hard" but not to intoxication. Duration of symptoms from beginning, twelve to fourteen months; of acute symptoms before entrance, seventeen days; in the hospital seven weeks and a half.

CASE IV. *Alcoholic Neuritis*. A. H., aged thirty-three years, male, grocery and liquor business. Had hip disease, left hip, when four years old, but grew up to be a strong, vigorous man; no rheumatism; no venereal. Used to be a butcher, until six years ago when he took up his present occupation. Drank liquor moderately, until two years ago, when he began to drink hard, twenty-five or thirty glasses of all sorts of liquor in the course of the day. Had an attack similar to the present one eighteen months ago, from which he partially recovered, on leaving off alcohol partially. Subsequently began to drink again, kept himself in a boozing state most of the time, but was never too drunk to take care of himself. Up to thirteen weeks before coming to the hospital had been drinking especially hard, but since then has abstained entirely. Entered the hospital, November 1, 1887, as a private patient under Dr. Shattuck. Thirteen weeks before began to notice increased weakness in his legs, the hands also became weak and he had to give up work; a week later limbs became numb and felt asleep, but were acutely sensitive to the touch; for three or four weeks had had sharp, darting, corkscrew pains in the legs, and especially in the feet, but not such as to keep him from sleeping; these pains had been diminishing, and at entrance had assumed the character of occasional dull pain and a numb feeling; no pain in arms, except slight lameness in region of right elbow; eyesight good, but fifteen weeks ago saw double and vision was blurred for a week or two.

November 1st. Appetite good, sleeps pretty well; temperature 98.8°, pulse 104. Tongue clean, protrudes straight; pupils equal, reacting to light and accommodation; grasps weak, with manometer right = 35, left = 32; left leg three inches shorter than the right; weakness of extensors of both feet very marked; toe-drop on left foot; knee-jerks and plantar reflexes

absent; tenderness on pressure over the course of all nerves of the arms and legs, but most pronounced over the posterior tibials; sensation diminished in legs and arms, but more marked in some areas, less noticeable on arms than on legs; perverted sensation on legs and feet, a touch on inner side of right foot referred once to left foot and again to right leg, a touch on right leg between knee and ankle referred to top of left foot. Romberg's symptom not tested on account of hip. Reaction of degeneration in legs.

November 10th. Improving slowly under galvanism (weak current), massage, quinine and arsenic. Present duration three and one-half months. Remains in the hospital, and will probably recover perfectly, perhaps in from four to six months.

CASE V. *Alcoholic Neuritis*. K. S., aged thirty-eight, female, married, housework. Had "rheumatism" twice, facial erysipelas once. No syphilitic history. Had borne six children and had two miscarriages; youngest child eight years old. Acknowledged the habit of drinking "a little beer." Entered the hospital, November 15, 1886, Dr. Shattuck's service.

Subjective Symptoms. For a month had complained of great weakness, poor appetite, occasional dry cough. Any little unusual event worried or excited her unduly; lately when excited had experienced feeling of oppression about the heart. Sleep pretty good.

Objective Symptoms. Examination of thorax and abdomen negative result, except a good deal of tenderness in lower intercostal spaces on both sides of thorax. Tongue pale and flabby. Tongue, eyelids and hands tremulous. Pupillary reaction to light and accommodation present. Patellar reflex absent; plantar reflexes very active; slight diminution of sensation in legs; tenderness on pressure in right calf and over upper portion of both sciatics. Temperature 99.2°, pulse 104, respiration 24. Urine normal.

November 20th. Appetite and sleep pretty good, but mentally mildly confused. Got out of bed several times at night and wandered about aimlessly. Complaining of pains in the legs, and of a "crushed" feeling about the heart. Pulse small and somewhat accelerated.

November 24th. Complaining of stiffness in the knees, and much tenderness over the nerves of the legs was noticed.

November 27th. Marked tenderness over both sciatics and over posterior tibial nerves on both sides; slight diminution of sensation in areas over both legs, especially on right; loss of power in muscles which move right toes and foot, less on the left side. Knee-jerks still absent. No tenderness in the arms. Had delusions that she went to various places during the day, at night got out of bed and wandered aimlessly about.

December 4th. Quite emotional; no memory, delusions as to time and space.

December 7th. Still great tenderness over nerves in the legs, especially posteriorly; knee-jerks still absent, and plantar reflexes active. Tongue brown, dry and heavily coated; pulse 120; temperature 100°. Thorax and abdomen were examined without finding anything abnormal.

December 10th. Growing weaker; attempts at speech for the most part unintelligible mutterings. Sordes on teeth and lips.

December 12th. Failed rapidly since the last record; nearly comatose, respiration very rapid, swallowing almost nothing; when moved in bed seems to suffer great pain. Death.

Duration in hospital twenty-five days; from beginning about two months. An autopsy could not be obtained; about one and one-half inches of the upper part of the posterior tibial nerve was given Dr. W. W. Gannett for microscopical examination, but he failed to find any signs of neuritis in that piece.

CASE VI. *Alcoholic Neuritis with previous Phthisis.* E. F., aged thirty-one years, female, married, housewife. No history of alcoholic habits. Entered the hospital, general service, July 21, 1885, on account of phthisis, for which she was treated. One sister died of "consumption." She reported having had "rheumatic" pains a year previously, and confessed to drinking beer. Her illness began four months before admission to the hospital with a "cold." Record says: "for past three weeks has noticed that she sees double at times. At first the right eye turned out somewhat and the eyelid drooped a little. . . . Pains all over her, especially in the legs."

August 4th. Pains in the legs less, general condition improved.

August 13th. "Rheumatic" pains now chiefly in the feet.

August 17th. Feet strongly extended and painful. Gastrocnemii painful and spasmodically contracted and twitching.

August 31st. Less pain in feet, but still strongly extended.

September 2d. Splints applied to feet.

September 4th. Patient could move feet freely; slight sensation of pins and needles in the legs. Sat up.

September 16th. Could move the feet freely, but still complained of the pin-and-needle sensation, pains in legs and feet much better. The signs in the lungs had increased in extent, and the patient constantly lost flesh and grew weaker. She was transferred to the "nervous service," in charge of Dr. Prince, and the record of this service says: "For the past four weeks has been unable to walk; complains of numbness in the legs and a feeling of pins and needles in the toes; legs and arms have been very painful on pressure for six weeks. Sometenderness now present over the course of the anterior crural and sciatic nerves; general weakness of the legs; no anæsthesia of the legs; patellar reflex absent.

September 26th. Marked choreic movements of toes reported as coming on at intervals of an hour or two and lasting a few minutes. Right tibialis anticus responded to only the strongest faradic current; electrical excitability with faradic current much diminished in both calves, and the same true of the extensors of the thighs; other muscles were not tested; electrical sensibility of the skin diminished.

The pulmonary signs pursued a progressive course; the patient failed and died November 17th. The autopsy gave: tuberculosis of lungs (chronic), tubercular ulcer of the intestine, fatty infiltration of the liver. Dr. W. W. Gannett, who made the autopsy, removed the ischiatic nerve of the left leg from a little below the middle of the thigh, together with its two primary branches, down nearly to the ankle, hardened portions in osmic acid and examined them microscopically, but no evidence of neuritis or other lesion was discovered.

CASE VII. *Alcoholic Neuritis with Phthisis.* E. W., aged thirty-two years, female, housewife. Was brought to the hospital, October 18th, to Dr. G. H. Lyman's service, in a delirious condition, and unable to give an account of herself. From the husband, the following points were subsequently obtained: One sister died of phthisis; had been married seven years; never pregnant, catamenia very irregular and scanty, but painless. For three or four years, patient had been much troubled with vomiting, and this had increased markedly in the previous six months. For about three years, had been subject to so-called hysterical attacks, lasting a few hours, during which time her mind was much confused. For three weeks, had vomited much less; fell into a state of semi-unconsciousness two weeks before, from which she had not been aroused. Tongue dry, brown, and parched; pulse 132; abundant fine, moist râles over both backs, most marked at right apex, where there was dulness, broncho-vesicular breathing at both apices. Urine and feces passed involuntarily. Pupils equal, reacting to light; no strabismus. Feet held in position of equino-varus; loss of power in extensors, and muscles of calf of leg flabby, patella tendon reflex absent, tenderness on pressure over nerve trunks of legs and thighs; sensation diminished over both legs. Weakness of extensors of forearms, with tendency to wrist-drop.

October 24th. Pulse 148, respiration 48. Patient's pulse and respiration became more rapid, and she died October 26th.

An autopsy by Dr. Gannett gave, as a pathological diagnosis: Chronic adhesive pleurisy; fatty infiltration; chronic tubercular broncho-pneumonia of liver; tuberculosis of spleen; tubercular ulceration of intestine; infantile uterus, small ovaries. The brain and cord were removed for examination. The peripheral nerves were not examined.

The husband, upon being further questioned, admitted that his wife took stimulants by physicians' orders, but never, to his knowledge, to excess. It was also subsequently learned from the physicians in charge before the patient entered the hospital (Drs. Doe and Breck), that a diagnosis of alcoholism had been made early in the summer; that the patient had been noisy and troublesome at times, but there had been no signs of tuberculosis, and no paralysis as late as the end of September.

CASE VIII. *Alcoholic Neuritis, with Nephritis.* C. S., aged thirty-three years, female, married, a housewife. Decided alcoholic history. Unable to walk for a week before admission to the hospital, September 14, 1885, under Dr. Prince. When seen, complained of loss of power in the legs, and was unable to stand; also of a feeling of numbness in the legs. Had to lift the legs to cross them. Patella tendon reflex absent. Spots of incomplete anæsthesia and analgesia on the legs, which became more extensive and more pronounced a few days later. Pain and tenderness over nerve-trunks and muscles in legs, but not in arms; also over muscles of abdomen, chest, and back. Reaction of degeneration in muscles of legs.

October 20th. Knee-jerk still absent, but tenderness over the nerve-trunks of legs little noticeable.

November 12th. She had improved so far as to be able to walk a short distance, and was discharged, relieved, at her own request. Course, two months.

CASE IX. Alcoholic Neuritis — Nephritis. F. M., aged forty years, female, widow, dress-maker. Had always good health. Borne four children, and had as many miscarriages. No syphilitic history obtained. Entered the hospital, November 16, 1886, Dr. Shattuck's service.

Subjective Symptoms. For two months, had been losing appetite and strength, smell of cooking causing nausea. Had felt nervous and "fidgety," and a strong craving for beer. Said that she had lost more flesh than she could "afford to." Gave up work three weeks before admission.

Objective Symptoms. Well developed, rather corpulent. Tongue red and glazed. Decided tremor of tongue, less of the extended hands. No tenderness or impairment of sensation over the arms. Great sensitiveness over the nerve-trunks in the calves, and in front of the thighs. Below the lower third of the thigh, considerable hyperæsthesia of the skin, sensation perverted; and, in lower portions, tactile sensibility impaired in areas. Patellar reflex absent. Unable to move toes of left foot, and those of right but slightly.

Examination of thorax and abdomen. Negative.

Urine. Turbid, alkaline, albumen; sediment, pus, squamous epithelium, numerous hyaline casts. Temperature 97.4°, pulse 124, respiration 24.

November 19th. Grew steadily worse since record. Slept little, delirium of a muttering type, stupor, at times somewhat noisy. Pulse rapid and small, temperature subnormal.

November 22d. Stupor had increased, gradually deepening, interrupted by occasional delirium. Pulse had continued rapid and almost imperceptible at the wrist; respirations were shallow and jerky; temperature always subnormal. Patient swallowed pretty well till just before death, which occurred on this date.

Duration. Six days in the hospital; nine weeks from the time she began to feel sick.

Autopsy by Dr. Gannett. Chronic adhesive pleurisy; injection of kidneys; chronic salpingitis; chronic pelvic peritonitis. Right ischiatic nerve removed, hardened for twenty-four hours in a one per cent. solution of osmic acid, and examined in glycerine. It showed extensive destruction of axis cylinders, and loss of white substance of Schwann.

CASE X. Multiple Neuritis. Alcohol and Phthisis not present; No Syphilitic History, though undoubtedly frequently exposed to infection; Toxic Influences could not be ascertained as present, or as having been active; Epileptic until two years before coming under observation; No Rheumatic History; No History of Exposure to Cold or Fatigue. T. H., aged forty-five, female, widow, nurse. Entered the hospital, April 6, 1887, Dr. Shattuck's service.

Subjective Symptoms. Three months before, began to have a feeling of numbness in the fingers of the right hand (Dr. J. J. Putnam's "numb fingers"). This extended up the arm, and then up the other arm, and both feet and legs were affected in the same manner. Since five weeks, had not been able to walk without assistance. She said when she stood, it felt as though she were standing on pins and needles. Could not hold anything in her hands without watching it. During the first part of attack, could not see to read; subsequently, as well as usual; at one time, had difficulty in swallowing, but that passed away. Complained of cramps in feet and legs, and of coldness of extremities.

Objective Symptoms. Great tenderness on pressure over all the affected parts, but greater over nerve-trunks in the left leg and arm than in right; sensation in hands and arms, in feet, legs, and thighs much impaired, considerable pressure with the finger not felt, but a slight prick was felt immediately. Patellar reflex entirely absent; both grasps extremely weak; could not stand without assistance, but by leaning on a chair-back walked very slowly moving the feet a few inches at each step. Pupils responded to light and to accommodation. General health was pretty good, temperature and pulse normal.

April 16th. Complaining of pain in the limbs, but less severe. Sitting up daily for a time. Pain relieved by friction with hot olive oil; also had massage and weak galvanic current.

April 26th. Was able to walk a short distance without assistance. Still complained of slight pains and of vague disagreeable sensations in the legs and feet. Blisters were applied over the course of the nerve-trunks.

May 6th. Steady improvement since last record, and had been out walking in the yard a few times. The day before returned from the yard feeling cold, and went to bed. Shortly after had an epileptic convulsion followed by two others.

May 16th. No return of the convulsions, continued to improve, and was transferred to St. Luke's Home, from which she was discharged, June 7th, "much relieved." She has since been heard of as pursuing her usual avocations. Duration before entering the hospital three months; in the hospital, St. Luke's Home, two months; total five months.

CASE XI. Multiple Neuritis. No Cause Ascertained. E. K., female, forty-six years old, married. Entered hospital, August 27, 1887. Service of Dr. T. M. Rotch, who was succeeded in charge by Dr. A. L. Mason, by whom patient was transferred to Dr. Shattuck. Family history negative. Said she had an attack similar to the present at the age of seventeen years, following exposure to wet and cold, and had had "rheumatism" several times. She thinks the present attack due to exposure in her work as a washerwoman. She seems to be a very respectable person, and repeated careful questioning has failed to elicit an alcoholic history. She is a German; has been ten years in this country; occasionally but not regularly takes a small amount of beer. Present attack began three weeks before entrance, with pains in ankles, knees, and hands, some swelling of ankles, chilly sensations. Appetite poor.

Physical examination. Well developed and nourished. Heart and lungs negative. Tenderness on pressure over nerves of body, limbs, and head. Sensation diminished. Atrophy and marked loss of power in the arms and legs. Patellar reflexes absent.

Temperature 100.2°, pulse 124, respiration 30. Urine pale, acid 1011, no albumen.

September 5th. Atrophy more marked. Tenderness over nerves still persists.

September 23th. Legs flexed on thighs constantly; considerable pain on attempting extension. Appetite good.

September 29th. Grasps very weak. Legs cannot be straightened.

October 6th. Flexion more marked; has been sitting up in chair daily since last note.

October 12th. Legs have been straightened by means of ham splints; and massage daily.

October 19th. Can move legs freely, but cannot flex and extend feet. Is just able to stand, but cannot walk.

November 3d. Moves legs a little more freely, but is unable to stand. Reaction of degeneration quite marked in arms and legs.

November 8th. Patient was transferred to Dr. Shattuck's service. Physical examination revealed the following: Marked loss of power in muscles of forearms and hands; grasps extremely weak, (with dynamometer right = 10, left = 13). Both legs weak, and moved with great difficulty. Complete toe-drop on both sides. Plantar and patellar reflexes absent. Some atrophy of muscles of forearms and legs; right calf measures 10 inches in circumference, left $10\frac{3}{4}$ inches. Sensation much diminished over forearms, hands, legs, and feet, more marked in some areas than in others. Tenderness over peripheral nerves most marked in forearms and legs.

This patient is still in the hospital, and has been there now two months and a half. Her attention was first attracted to her condition three weeks before admission, making the total duration about fourteen weeks. She improved at first somewhat, and then relapsed. She is again improving slowly but steadily under galvanism, massage, citrate of iron and quinine, and generous diet. She will probably recover, though it may take from six months to a year. I have been unable to discover any toxic influence as a cause, and I am inclined to believe her statements with reference to alcohol.

THE ENDOSCOPIC INSTRUMENTS OF JOSEPH LEITER OF VIENNA AND THE PRESENT DEVELOPMENT OF ENDOSCOPY.¹

BY OTIS K. NEWELL, M.D.

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WHOEVER has had much experience with the endoscope, especially in examination of the bladder, knows with what difficulty a well-illuminated field is maintained, since every deviation of the mirror reflected light, by hand-movement or otherwise, leaves the field in darkness, and the examination must be discontinued until the light is returned. This want of a permanent and easily maintained illumination has undoubtedly been what has kept the practice and good results of endoscopy so much in the background.

One year ago, I had the pleasure of showing before the Suffolk District Society my own endoscopic tubes. Since that time the improvement in methods of illumination has been so great, that from the practical standpoint there is scarcely any comparison. This has all been brought about by the successful application of the electric light to endoscopic illumination through the efforts of Joseph Leiter, the celebrated instrument-maker of Vienna.

About twenty-five years ago Bruck, of Breslau, had produced an electrical illuminating apparatus for examination of the mouth and bladder. The light was from a platinum wire, and in order to overcome the intense heat produced, a coil of pipe for circulation of cold water about the lamp was necessary. This instrument, although it could be used, was never of very practical application.

¹ Read before the Massachusetts Medical Society, Suffolk District, October 29, 1887.

In 1877-78, Dr. Nitze, of Vienna, devised, and had made by Leiter, similar endoscopic instruments, but their complexity and high cost stood in the way of their extended use either for instruction or practical purposes. Urged by Nitze to further continue experimental work with these instruments, Leiter, by his indefatigable energy and admirable devotion to the not very remunerative work, has at last succeeded in perfecting all that seems necessary to the further and rapid development of endoscopy.

In 1883, I had the pleasure of visiting the International Electrical Exhibition at Vienna, and I afterwards learned that it was there that Leiter's attention became directed to the carbon filament light, and the problem of endoscopic illumination seemed then to be solved. Professor Dittel, who had already obtained some good results with the previous instruments in examination of the bladder, gave his strong coöperation to Leiter, and towards the end of 1886 a practical endoscope for this purpose, cystoscope, was produced. In 1887, an electro-reflector for the illumination of plain endoscopic tubes was finished, and as it was to be applied to all tubes for examination of any of the body cavities, Professor Dittel suggested for it the name of "Panelectroscope." The gastroscope was made under the the direction of Professor Miculicz, who has had the most extended experience with this instrument. It corresponds closely to the cystoscope in construction differing only in a double reflection of the picture in its optical arrangement, and in having in addition a double air current through its tubes, one for cooling the lamp and the other to distend the stomach.

In March of 1887, Professor Dittel showed the instruments before the Imperial Medical Society of Vienna, and the thanks of the society were voted to Mr. Leiter for the self-sacrifice and zeal which he had shown in bringing his efforts to a successful termination.

In detailing the construction of these instruments I can do no better than to quote as much as possible from a description by my friend, Dr. Alexander Brenner, of Vienna, published in the *Centralblatt für Chirurgie*, 1887, No. 25.

THE CYSTOSCOPE.

The body of this catheter-shaped instrument is formed by two thin metallic tubes, one within the other, separated by an intermediate layer of non-conducting material. These two tubes are connected with the battery. The lumen at the outer end of the tubes is closed by an ivory plate into which two cylindrical metal capsules are sunk. The capsules are connected one with the inner, one with the outer tubes for conduction. If now a small incandescent lamp is united with the tubes at their lower end, and the capsules are connected above to the wires from the battery, the current circulates through the carbon filament, and with a strength of about three to four volts brings it to a white heat. The intensity of the light when run by the battery and fluid as made by Leiter (Fluid = 336 gms. pure chromic acid; 250 gms. sulphuric acid; 2000 gms. water), remains for hours equal. The lamps last about thirty hours, and when burned out can be replaced.

In order to be introduced into the bladder, and for its best protection, the lamp is covered by a metallic capsule, the "lamp-house," which screws down over