LETTSONIAN LECTURES

ON

SYPHILIS AS A CAUSE OF DISEASE OF THE NERVOUS SYSTEM.

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LECTURE III.—Continued.

Syphilitic Cerebral Tumours.—Among the most interesting examples of syphilitic disease of the brain, are those in which the morbid deposit takes the form of a distinct tumour. The symptoms common to nearly all cerebral tumours, when any symptoms at all are present, are, severe pain in the head, vomiting, and double optic neuritis, the pain being fixed in seat or radiating from one point, but variable in intensity at different times. Cases, however, are on record in which tumours have attained a large size without giving rise to abnormal phenomena of any kind; and, although the concurrence, for any long time, of the three symptoms mentioned would be almost conclusive of the existence of tumour, the absence of one or other would not necessarily be conclusive to the contrary. Superadded to these general symptoms may be hemiplegia, motor or sensory, if the central ganglia be involved, or paralysis of individual nerves if the tumour be situate at the base of the brain, or convulsions if the grey matter of the surface of the hemispheres be affected.

The symptom of greatest importance is unquestionably the double optic neuritis; and, as Dr. Hughlings Jackson, in particular, has pointed out, it may for some time be the only symptom; or, if not quite alone, it may be associated with symptoms so slight as to have no significance independently of it.

We must not wait till vision begins to suffer before examining the eyes. It is with constantly renewed astonishment, notwithstanding the frequent illustrations brought forward by Dr. Jackson, and exhibited to this Society and elsewhere, and my own experience, that I see the extensive changes in the disc compatible with good vision. We are as yet in uncertainty as to the immediate mode of production of optic changes, and of the chain of causation by which they are connected with tumours. It may, perhaps, be taken as certain that one way in which changes in the optic disc are produced is by increased intracranial pressure; and it appears probable, moreover, that this intracranial pressure operates through fluid being forced along the sheath of the optic nerve between its two layers, which bulges out the sheath near the eye, and compresses the nerve and its vessels. But the optic changes may be entirely absent, or having appeared may subside, when we have every reason to suppose, from examination after death, that intracranial pressure must have existed; and they may be present when we can see no cause of intracranial pressure. If the existence of fluid in a position to be carried into the optic sheath be a condition required for the production of strangulation of the nerve, the absence of effusion in the membranes at the base of the brain may explain some cases in which optic changes have not appeared. But it is not even a settled point whether there is, or is not, a distinction between ischæmia of the disc, a vascular strangulation or obstruction due to intracranial pressure, and neuritis descendens, an inflammation propagated to the disc by the continuity of the neurilemma with the pia mater; or, admitting the distinction, whether the difference can be made out by ophthalmoscopic characters. Till this is decided, we cannot so much as pass the threshold of the inquiry as to the mode of production of optic changes in diseases of the brain. If I were not held back by the doubts of men such as Dr. Hughlings Jackson and Mr. Hutchinson, whose opinion in this matter I hold to be far higher than my own, I should consider my own experience warranted me in following Dr. Clifford Allbutt in recognising a difference between optic ischæmia and neuritis.

While we cannot explain satisfactorily the mode of production of optic changes, their clinical associations and significance are better known. They commonly, almost constantly, accompany tumours in whatever part of the brain they may form, and perhaps more constantly syphilomata than any others; they usually accompany abscess, very frequently meningitis, especially inflammation of the membranes at the base of the brain; rarely hæmorrhage, unless as a consequence of consecutive inflammation; rarely embolism or thrombosis, though, in one case of thrombosis, I have seen the most marked optic ischæmia. They do not

accompany the molecular change inappreciable to the naked eye, and, as a rule, even by the microscope, which gives rise to epilepsy or chorea.

Syphilomata usually give rise both to general symptoms and to such as aid in giving the locality, and I do not remember to have read of a case in which an unsuspected syphilitic tumour has been found after death. This is, no doubt, a consequence of the fact that syphilomata affect either the surface of the hemispheres, or, if they form in the substance, it is at vascular parts such as the central ganglia.

I must trust again to my cases to illustrate the effect producible by syphilitic tumours; but I must notice more particularly a form of affection to which Dr. Hughlings Jackson has specially called attention as frequent in connection with syphilis, and in some sort characteristic of syphilitic cerebral disease. The prominent feature in these cases is unilateral convulsion, unattended, for the most part, with loss of consciousness. The convulsive movements may vary in degree from a mere twitch or slight stiffening to the most violent agitation, and may be accompanied or preceded by sensations of various kinds. Usually, the starting-point is constant in a given case, and very frequently this will be the thumb and index finger; beginning here, the agitation may in one attack be confined to the upper extremity, and there may be no loss of consciousness; at another time, it will invade the entire lateral half of the body, travelling up the arm to the shoulder and face and down the leg, becoming bilateral where the nerve-nuclei of the two sides are associated; or sometimes the arrival of the agitation and accompanying sensation at the head and face, may be the signal for general convulsions and loss of consciousness. If the convulsive movement begin in the foot or face, a similar course may be followed, and, after the unilateral convulsions, the limbs which have been affected may be left paralysed for a time from exhaustion of the nerve-force; and when the hemispasm, as it has been called, is on the right side, and especially when the starting-point is the face or tongue, temporary loss of speech is very common.

Sooner or later, and often very early, optic neuritis usually comes on. Dr. Jackson has shown that this hemispasm is due to disease in the convolutions of the opposite hemisphere, almost always near the fissure of Sylvius, and has shown that particular convolutions are involved according as the convulsions begin in the hand, foot, or face, thus extending our knowledge of the localisation of function in the cortex of the brain, and giving occasion for the experiments of Dr. Ferrier, which have deservedly excited universal attention.

Dr. Hughlings Jackson has usually found the disease in these cases to be a syphilitic tumour; but the symptoms are, of course, determined by the situation, and not by the nature of the growth. The frequency, however, of syphilomata in these cases will, in cases of doubtful character, be a reason for entertaining the hypothesis of syphilis as a provisional diagnosis.

I do not find many examples of unilateral convulsion in the large collection of cases of syphilitic cerebral mischief by Zambaco, Gros, and Lancereaux; one reason being, that observers have not been duly aware of the importance attaching to them. The latter authors, giving the situation of syphilitic tumours in the brain, find, in one case, the entire cerebral mass infiltrated; in one, disseminated exudation in different parts; in six, tumours in the anterior lobes; in three, in the middle lobes; in three, in the corpora striata; in three, a great part of the hemisphere.

Some of these must certainly have been Dr. Jackson's cases. I have only had the opportunity of following one case of unilateral convulsion with double optic neuritis to a termination. I narrate it here with a certain reserve; there was no syphilitic history, there were no syphilitic lesions of the organs generally, and the tumours found in the brain, though certainly not malignant or tubercular, could not be definitely pronounced to be syphilitic, and the only corroborative evidence was a remarkable thickening and condensation of the bones of the skull. Other cases, distinctly syphilitic, recovered or disappeared.

CASE 1. Unilateral Convulsions (Hemispasm); Optic Neuritis; Small Tumours on Supramarginal Lobule.—Clara C., aged 36, a widow, earning her bread as a needlewoman, first came under my care as out-patient of St. Mary's Hospital, on October 4th, 1867, with the following history. She had enjoyed good health; had had seven children, of whom, however, only three were alive, the others having died young. There was no distinct evidence of syphilis. During the previous winter (1866-7), she had been much exposed to cold; had been hard-worked and poorly fed. In March, 1867, she had a fit for the first time, in which she lost consciousness for half an hour, and was convulsed; she slept after it for several hours, and it left her weak, but she was living very poorly at the time. Nine days afterwards, she had, three times in twenty-four hours, a pricking sensation in the left fingers, which extended up the arm; the left side of the face "worked," as did also the jaw, so that it was with some

difficulty she avoided biting the tongue; the eyes were spasmodically closed; there was no loss of consciousness. Attacks similar to that last described had come on at intervals of fourteen, twenty-one, or twenty-eight days, the last a month before her admission; they were usually induced by excitement, and lately had not gone beyond agitation of the hand and arm.

Two months ago, she began to have severe pain in the head, more particularly in the occipital and right temporal regions. The pain had come on at intervals, especially after excitement. She could not lie on the right side, this position bringing on pain in the right temple. The pain had now ceased; but, three or four weeks since, she began to lose her sight, and she had rapidly become almost totally blind.

October 8th, 1867. She was fairly well-nourished, but rather pale; her expression was sad, but resigned; the patient was particularly intelligent and clear-headed. Vision was almost completely lost. She could distinguish a strong light, and tell when a large object was passed between her eyes and the light, nothing more; the eyes had the restless movements characteristic of amaurosis; the pupils were large, but not greatly dilated, and quite insensible to light; the right rather the larger of the two. On the 4th, the right pupil was dilated to the utmost degree, so much so that there seemed to be no iris. The eyes were examined by Mr. Hart, who found optic neuritis passing into atrophy. The left side of the face was rather smoother than the right, and moved less when she spoke; the difference was very slight. The tongue was put out straight; it had a brownish fur upon it. The left hand was rather weaker than the right; its movements were not interfered with, but simply deficient in power. Sensation was apparently equal on the two sides of the face, but defective in the left hand, whether tested by pricking or by compasses. She had great difficulty in picking up any small object such as a pen, but it was not easy to decide whether this arose from deficient sensation or from imperfect co-ordination. She was ordered three grains of iodide of potassium in infusion of quassia three times a day.

October 15th. She had no fits since the previous visit. Her general condition and state of vision were much the same. She imagined she saw a little better, and better at some times than others. The fingers of the left hand were slightly flexed, and, when she tried to extend them at my request, they were moved vaguely in various directions. The ring and little fingers, she said, were weaker than the others. The catamenia were overdue fourteen days.

I saw her only once more, on October 24th, when she said she was losing the sense of smell.

The patient now attended one or more ophthalmic surgeons, in the hope of recovering her sight. She was under my care a second time, for a brief period only; the notes of this attendance have been lost, but no important change in her condition had taken place. She again applied as out-patient on January 7th, 1870. On the previous day, January 6th, she had had nine convulsive attacks, which she described as follows. First the left hand became cold, then the hand began to work, and, after a short time, the eye (lid); she bit her tongue and foamed at the mouth, but she did not lose consciousness. The leg was not affected. The attacks left a pain in the temples, and afterwards the catamenia, which were overdue three weeks, came on. Her intelligence was quite unimpaired, but she had become very nervous, apprehensive, and low spirited; she often "gave way," and cried. She had, when seen, pain in the right side of the head, and the tongue was still sore from the injury done to it in the convulsions. Vision was entirely gone; the eyes were restless; the pupils dilated and insensible. The optic discs were in a state of advanced atrophy.

The sense of smell had been entirely lost for four or five months, and with it the sense of taste, in a great measure. She was unable to distinguish or perceive the odour of meat, beer, wine, scents, etc., but the pungency of smelling salts was felt. She could taste bitters, sweets, acids, and salt, and appreciate pungent substances, but meat, beer, and flavours generally, she did not taste. This loss of smell and taste had been gradual. She had begun to fear the right ear was becoming deaf. The left hand was habitually semiflexed; she could move it in any way, but could not use it; sensation was impaired, but not lost. There was no distinct evidence of paralysis in the face or tongue. She was ordered thirty grains of bromide of potassium, and fifteen minims each of aromatic spirit of ammonia and tincture of orange-peel in water every four hours.

Nothing further of any importance was noted, except that she complained on the 24th of giddiness, pain at the back of the head and nape of the neck, "pricking and shooting" in both eyes and at the top of the head, till the 31st, when "twitchings" of the hand and face came on at 10.30 A.M., and again while she was at the hospital. The movements began in the hand, but, when she was under observation, consisted of repeated (almost rhythmical) simultaneous rapid contractions of the flexors of the fingers of the left hand, and twitchings of the corner of the

left eye and of the left angle of the mouth. The hand was rigid when held, and it did her good when the movements were restrained. The eye felt tight. The movements lasted for some minutes, varying in intensity, and ceased soon after the administration of a draught containing ether, ammonia, and camphor. She was greatly distressed during the attack. The bromide, which had been discontinued for a week, was resumed, and she was ordered to take ether and ammonia whenever she was threatened with an attack.

February 7th. The ether draught had cut short several attacks during the week, and had relieved a sensation in the head of extreme tension, as if it would burst. She had been very low-spirited; could not bear to be alone. At times, the left side of the mouth had been drawn up, and she found the left leg becoming weaker, and giving way at times.

February 14th. No attack. She was pretty well till this morning, when she had a round of immoderate laughter, and lost her memory completely for a time. At the visit, she did not recognise my voice as usual, and she had to be told that I was present. The left hand had been very cold on the previous day.

She was now admitted into the hospital as in-patient. Iodide of potassium was given in large doses, and various means were tried. She had fewer attacks, and rarely lost consciousness.

The events of the last few days of her life were as follows. She was greatly excited about the expected confinement of her daughter, and, on April 7th, she complained much of headache, and was in very low spirits. On the evening of the 8th, on which day the confinement had occurred, she had a series of severe epileptiform fits, preceded, for some time, by violent movements of the left hand, arm, and leg, which she begged to have restrained by the nurse. In the fits, she was unconscious, and convulsions were general, but by far most violent in the left limbs; the tongue was bitten, and her face became livid. There were four violent convulsions between 9 and 10.30 P.M., and she was unconscious in the intervals. After 10.30 P.M., she became partially conscious; she knew when she was spoken to, but, unless disturbed, took no notice of anyone. She remained in this state through the night, and in the morning, April 9th, had another series of fits, slight and short; there were eight of them before 10.30 A.M.; for the remainder of the day, she was dull, heavy, and sleepy. At 6 P.M., the attacks recommenced, all beginning in the left hand, and the convulsions were throughout most violent in the left arm and leg, and the head was turned forcibly over the left shoulder. They occurred about every half hour through the night, and in the intervals the left arm was quite powerless. Again, on the 10th and 11th, during the day, the attacks were few and slight, but very numerous in the night. The convulsions now, however, lasted only a few minutes, during which time she was unconscious; afterwards, she slept heavily, and snored for a short time, but, in the intervals, said she was better. She complained much of pain in the head. Indications of exhaustion set in, mucus accumulated in the air-passages, and she died quietly at 8 A.M., April 13th, having had no convulsions for fifteen hours.

When the epileptiform attacks first set in, the bowels had been confined for two or three days, and a croton oil pill was given and stimulant enemata were used. The ether and ammonia draughts, which had frequently been found useful before, were taken, and, other measures failing, leeches were applied to the head; but nothing seemed to have any influence in preventing or moderating the fits. Beef-tea, milk, and brandy were given freely so long as she could swallow, and nutrient enemata were administered when she was unable to take sufficient food by the mouth.

On *post mortem* examination, the thoracic and abdominal viscera were found to be healthy, except that the liver was paler and softer than usual. The bones of the cranial vault were unusually thick and heavy. The dura mater adhered firmly to the pia mater over the posterior part of the right hemisphere, and, when it was detached, there were seen two small bodies about the size and shape of a small split pea, each surrounded by a circular depression; the depression, with the body in its centre, would have been more than covered by a shilling. The precise seat of the lesion was the supramarginal lobule, the irregular convolution just above the posterior end of the fissure of Sylvius, and behind the lower end of the second ascending parietal gyrus. The small tumours were almost white, very firm and hard, and presented no structural peculiarities by which they could be identified. Around them, the grey matter had been absorbed or destroyed to the extent indicated by the depression, leaving only connective tissue which had a gelatinous appearance. No other morbid change could be found, nor could any degeneration of fibres between the seat of disease and the central ganglia be traced.

CASE II.—In October 1871, I saw, with Mr. Walter Coulson, a gentleman who, after syphilis in 1867, suddenly lost power in the right arm while driving about Vienna. He felt giddy, but did not lose consciousness, and he went to several places afterwards. The paralysis in

the arm grew worse, and became almost complete before the day was out; but, in the course of a few months, he regained power, and the only difference now experienced was, that he did not use this hand so well in playing on the piano as before. This was probably thrombosis of a small branch of the middle cerebral artery, due to syphilitic inflammation, one of the modes in which paralysis may be indirectly induced by syphilis.

Twelve months later, he began to have a peculiar twitching in the left upper extremity and face. The fingers, especially the two middle ones, stiffened, the face was drawn, and he could not speak; he put his handkerchief to his mouth for a minute or two, and was then right again. These attacks were not more frequent after exertion or excitement, and did not prevent his conducting extensive and important business affairs. They were more frequent when in England than when travelling, and occurred rarely while at sea. They were apparently more frequent after cold baths. Iodide of potassium had been given in large doses for some time. It was continued together with cod-liver oil and phosphorus, and, when I last heard of the case, the attacks had ceased.

CASE III.—Samuel M., aged 32, had had syphilis four years before his admission into St. Mary's Hospital in May 1869, but had not suffered from any recent manifestations till he became subject to attacks of the following character. A feeling of pins and needles came in the right hand and arm, which he could move, but not use for any purpose, having almost lost power in it. After this, he lost his speech for a quarter of an hour, and the face was a little drawn; but he never became unconscious. He suffered also from pain in the head. The symptoms entirely disappeared under treatment by iodide of potassium.

CASE IV. *Pain in the Head; Intellectual Disturbance; Double Optic Neuritis*.—Joshua C., aged 33, wheelwright, was under my care in St. Mary's Hospital from July 7th to August 15th, 1871. He was said to have had a sun-stroke twelve months before, and to have had numerous blows on the head in the course of his work. Syphilis was denied, but he had numerous pigmented scars on the legs, and an ulcer of syphilitic appearance. He had for six weeks been suffering from pain in the head and abdomen, of which he still complained when first seen, together with noises in the ears. He had a confused and dazed look; his speech was hesitating; his answers were usually correct, but he required time. He read in the same slow, hesitating way, stopping at short common words. Pulse, 80; temperature, 98. Tongue white and moist. His bowels were confined. He had perspirations at night. Vision was good. On ophthalmoscopic examination, there was a generally exaggerated redness of the fundus; the discs were hyperæmic, presenting many vessels, not well defined, especially at the outer margin; the left had an appearance of elevation not present in the right; the retinal veins were large and dark; the arteries small. Iodide of potassium was given in moderate doses, but he grew worse; had delusions; voices came to him from a ventilating aperture in the wall opposite, telling him to place his arms in certain attitudes; Lady Jane was always ringing in his ears; he talked of purgatory, etc. One day, he dressed himself under the bedclothes, got out of the ward, and slid down the bannisters of the staircase, and was greatly excited when brought back. At another time, the right arm, and then the entire body, became rigid. The ophthalmoscopic appearances became more decidedly those of optic neuritis; the discs red, swollen, irregular, ill-defined; the retinal veins very large and tortuous; there were, however, no hæmorrhages.

On July 26th, the iodide having failed to do good, a grain of calomel was given three times a day for three days, then twice a day. On August 2nd, the gums had become affected, and there was a marked change in the symptoms. The patient was quiet, had no delusions, answered better, and did not ramble in his talk. The optic neuritis subsided, and the improvement continued; he left on August 15th, free from any active symptoms, but stupid and weak, and he remained in this condition for some time, having a peculiar weak and distressed look.

CASE V. *Motor Paralysis of Right Limbs only; Loss of Sensation in entire Right Half of Body and Face; Slight Mental Disturbance; Fits*.—A needlewoman, aged 36, married five years, but without children, came under my care at St. Mary's Hospital in March, 1872, with the following history. She had been ailing for twelve months, but not sufficiently to interfere with her work, till, after suffering for a fortnight from nocturnal pain at the top of the head, across the forehead, and over the right eye, she became unable to read or sew, on account of dizziness and dancing of objects before her eyes. This was about a month before she came under my care. A week later, one day while lighting the fire, the right arm became numb, with a sensation of pins and needles; and, a little later, the right leg was similarly affected, and was alternately hot and cold. She felt it necessary to keep both arm and leg moving. A week after this, or about a fortnight before her admission, she observed that the right leg dragged as she walked, and she was unable to flex it

while standing, though she could draw it up when in bed; the right upper extremity also became weak, so that she could not hold a tea-spoon. She had a gnawing pain also in the right shoulder.

When she came under observation, there was a little dragging of the right leg; the right arm and hand were very weak; she was unable to pick up a pin or to grasp the hand, but then no evidence whatever of paralysis of the face could be elicited; she even winked the right eye equally well with the left; the tongue was protruded straight. Sensation was markedly impaired over the entire right half of the body and face, so much so that the prick of a pin was scarcely at all felt. The right pupil was somewhat larger than the left; both were sluggish; the optic discs were normal. The pain in the head had increased, and was especially severe in the afternoon and evening; she was scarcely able to open her eyes on account of it. The pulse, heart-sounds, temperature, and urine, were all normal. The abdominal aorta pulsated more strongly. There was no acknowledged history of syphilis, but the soft palate had been perforated by an ulcer, and there was reason to believe that she had been a prostitute.

Iodide of potassium was given in doses of eight grains three times a day. After a week, during the greater part of which she had been growing worse, it was increased to sixteen grains. At this time, she was unable even to raise the right hand; the leg dragged more than ever, the toe turning out, and the foot falling like an inert mass. The left arm appeared to be weak as well as the right. Sensation was all but extinct in the right half of the body and face as well as in the limbs, though there was still no motor paralysis of the face or tongue. She had now also become excitable and troublesome.

A week later, improvement was manifest, but the dose of iodide was again increased to twenty-four grains, and with it was given one-sixteenth of a grain of biniodide of mercury. From this time, the progress was very rapid. In another week, she was cheerful, useful, and active in the ward, having recovered power in the hand, though the leg still dragged. Sensation had returned everywhere, and the headaches had ceased.

Her stay in hospital was only twenty-six days, but she returned in little more than a month suffering from fits. She had taken iodide of potassium in twelve-grain doses for a short time after her discharge, but had soon neglected herself, and discontinued it. About three weeks afterwards, the fits began to come on; in the first, she felt hot and cold, then fell down, but did not lose consciousness; afterwards, she had usually two a day, and in most became unconscious. She had begun to take the medicine again before she was readmitted, and the attacks had already diminished in violence, but she was strange in her ways; she had also nodes on two ribs and on the right shin. The fits witnessed in the hospital were of different degrees—in the night, there were slight general convulsions; she did not wake, and did not know in the morning that she had had an attack, but said she had had a good night; by day, she suddenly seized the bedstead above the head; the eyes were closed, and the lids trembled; it was doubtful whether consciousness was lost, or not. The right limbs had again become weak, and sensation was impaired in the right half of the body generally.

The improvement under treatment was again very rapid, and she left the hospital in a fortnight to go to a convalescent institution, taking medicine with her. She was heard of some time later, quite well.

In the only case I have had the opportunity of examining after death in which there was the combination of symptoms presented here, partial paralysis of the limbs with disproportionate impairment of sensation in both face and limbs, the lesion was situated at the junction of the tegmentum with the thalamus; and I suppose, in the case just related, a small gumma had formed about this point, but I think it possible that exudation in the pia mater encircling the crus cerebri might give rise to a similar condition.

Cerebral Affections in Infantile Syphilis.—Cerebral affections have not been frequently met with in infantile syphilis, but a few cases are on record, and it is extremely probable that many have been considered to be examples of tubercular meningitis. If no *post mortem* examination had been made in the case I first relate, or if the *post mortem* evidence had not been so conclusive, I should have been unable, either from the symptoms, or from the history, to pronounce it syphilitic. Additional interest is given to this case, by another with which I am opportunely favoured by Dr. Heywood Smith, and in which the mode of access of the meningitis was strikingly similar. Dr. Smith's patient has, happily, survived the attack.

CASE I. *Syphilitic Disease of Brain and Liver in a Child; Convulsions. Left Hemiplegia; Coma. Induration of Right Cerebral Hemisphere and part of Thalamus; Acute Meningitis*.—A child, aged 3, was brought to me at St. Mary's Hospital, on May 24th, 1873, suffering from acute cerebral symptoms. The mother had never been well since her marriage; had only had one other child, and this died at the age of five weeks, from atrophy; no miscarriages. The little patient was small, had

always been delicate, had cut her teeth late, and had already lost some of them. The fontanelles were still open, but there was no other evidence of rickets; she had only walked three months, but talked early; was extremely sharp and precocious, and liable to fits of excitement, in which nothing could pacify her. The child was said to have had a series of falls three weeks before, and to have knocked her head, but had apparently been none the worse, till, two days before her admission, she became unconscious, screamed and kicked, and the convulsions, of which this description was given, lasted an hour and a half, after which she recovered; she remained conscious, however, only for a few hours, and it was observed that the left limbs were paralysed.

She was unconscious when admitted, moaned much, and at times screamed. The face was pale; the eyes were half open, and always turned to the left; the pupils were small; there was no facial distortion. The left arm and leg were partially paralysed, the leg apparently more than the arm; they were slightly rigid, and the thumb was drawn into the palm. The right limbs, especially the leg, were continually in motion. The pulse was frequent and weak; she swallowed food well; the bowels were not open; her urine was passed in bed. I failed to obtain a satisfactory view of the optic disc. She remained in much the same state till the morning of the 26th, when another attack of convulsions came on, affecting chiefly the right limbs, which were afterwards more quiet; but there were frequent convulsive attacks, in which the limbs jerked less violently, and the hands and feet became bent and rigid, so remaining even after death. During the last few hours of life, the temperature rose rapidly to 105 deg.

Post Mortem Examination.—The child was small for her age: the fontanelles were open, but there was no other evidence of rickets. The lungs were greatly congested, but no tubercle was found in them, or in any part of the body; and the abdominal and thoracic viscera were normal, with the exception of the liver, which was small, pale, and presented, on its surface, several depressed cicatrices of different sizes, with vascular ramifications. They were not deep, and the capsule was not greatly thickened; the lobules were wasted at these parts.

Brain.—When the dura mater, which presented nothing abnormal, was removed, intense meningeal injection was seen at the posterior part of the hemispheres, especially on the upper surface, but also on the inner and lower aspects; it extended into the sulci. There was undue softness of the posterior part of the right hemisphere, about the annectent gyri; almost black redness of the apex of the left occipital lobe, which was of leathery hardness. Nothing abnormal was found at the base, or in the Sylvian fissures; no tubercle anywhere. On section of the brain, there was seen great hyperæmia of its substance, especially posteriorly; the red points and striæ were excessively numerous, and there was a general dusky pink staining. A patch of red and softened brain-substance was found near the surface of the right hemisphere, about the annectent gyri. The ventricle had contained an excessive amount of fluid; the surface of the corpora striata, and the ventricular walls generally, presented unusual vascularity, especially posteriorly; in the right corpus striatum were one or two vascular patches, but its consistence was normal. The principal change was in the left occipital lobe, which was hard and shrunken. The induration was bounded by the occipito-parietal and calcarine fissures, and involved, therefore, the cuneiform lobule. The pia mater was of a deep red colour, almost black, and adherent. The grey substance had undergone atrophy, the white was firm and tough, like leather; the posterior cornu of the lateral ventricle was enclosed by this indurated white substance, but from the interior presented no abnormal appearance. There were superficial induration of the posterior part of the left optic thalamus, and some induration of the superficial transverse fibres of the pons; cerebellum normal.

The following is Dr. Heywood Smith's case, which I give in his own words.

CASE II. Symptoms of Tubercular Meningitis with an Hereditary Syphilitic Origin.—At 7.30 A.M., on Friday, November 14th, 1873, I was sent for to see C. M., aged 6½ years, who was said to be in a fit. On arriving, I was told that his sister was roused before seven by a noise, and found her little brother, as she said, shivering and unconscious. When I saw the boy, he was totally unconscious, with a slight tremor over the body. The eyes were nearly closed, the pupils inactive to light, left one more dilated than the right. Pulse small and rapid, 120 to 140. The respiration was reduced to 10, and at times seeming as if it would cease altogether; so much so, that it was frequently necessary to have recourse to artificial respiration. Ice was applied to the head, and brandy and ammonia were given in small quantities; but owing to the difficulty in deglutition, nutrient enemata were substituted. Two grains of dry calomel were shaken on to the tongue. Consciousness was not recovered till 2 P.M., quite seven hours after the fit was first discovered. On a cold hand being placed on the boy's forehead,

he started up with a cry and expression of extreme terror. Though he had so far come out of the fit, yet the intellect was not clear; there were periods of great restlessness and excitement, with delirious muttering and fear, as if from things seen about the room. It was not till three days that he became fairly rational. Dr. Dickinson saw the case with me on the Friday afternoon, and pronounced it a case of tubercular meningitis, and gave little or no hope of recovery. On the return of consciousness, the boy's whole expression was found altered—an alteration which had never wholly passed off. The eyes appeared drowsy, the pupils acted but sluggishly; the left pupil scarcely acted at all, and was permanently dilated; the abdomen was retracted, but not tender; the memory was confused, and headache was complained of, especially at a spot on a level with, and near to, the outer angle of the left eye. The same evening the calomel (two grains) was again repeated, and a mixture, containing iodide and bromide of potassium, given every three or four hours. The parents said that, until the fit, the boy had no signs of ill-health, with the exception of slight headache; of this, however, he had complained off and on for about a fortnight, but no heed was taken of it, as it was supposed to be mainly an excuse to get off his lessons.

The boy steadily improved, and began to be more cheerful and natural, till about a fortnight after the commencement of the attack, November 28th, there was an accession of fever and pain. Mercury was again administered freely, with aperients, and in a few days he was fairly recovered. About this time, the father's friends wishing to have Dr. West's opinion, he saw the child with me, December 3rd. He confirmed the former diagnosis, and gave an unfavourable prognosis. We got the child out of bed, and made him walk; there was decided failure of the left leg, the boy coming down on the right with more force; the mouth was slightly drawn to the right; the left pupil still remained dilated. I forgot to mention that, on December 1st, owing to the persistent pain in his temple, a small blister was applied, with very marked relief, the child apparently losing all pain. He was put upon a little quinine and cod liver oil; but the iodide of potassium, though at times intermitted, was persevered with, the quantity taken being about ten grains per day.

As the boy gained strength, I allowed him to play about with his toys, and to go out a little; and on watching him with his things, I noticed he looked at objects obliquely, and had some little difficulty in judging distances. I then tried him with letters, and each eye separately, when I found that, though he could read with the right eye, he could not see distinctly with the left, and, moreover, that he did not look directly with that eye. I therefore asked Mr. Power to see him, when he found that there was marked retino-choroiditis at the posterior pole of the left eye, with a distinct patch of effusion in the fovea centralis, marring permanently the direct vision of that eye; that there was a similar condition in the right eye, but there the inflammation, fortunately, was not central, but was situated more equatorially, nearer the ora serrata.

It is now nearly eleven weeks from the onset of the attack; the boy's health steadily improves; the tongue, which was patchy, is clean; the appetite is fair (though he prefers a latish dinner); he sleeps well; is playful, active, walks out, and runs about. There is still slight, though very slight, inequality in the gait, with permanent dilatation of the left pupil; the strange alteration of the child's expression, accompanied by greater fullness about the mouth, remains persistent. The great interest that attaches to this case, however, is the history.

When the child was six months old (six years ago), I was sent for to see it because of a rash, which the mother told me of, and attributed to the teeth coming. On my going upstairs to see the child, I found it completely covered with a syphilitic rash. The mother afterwards asked me what was the matter. I said the child had a constitutional disturbance, manifesting itself in a skin-eruption, but that I had no doubt it would soon be well. In three or four days, the rash had entirely disappeared under mercury, and the child was kept for nearly a year under small doses of iodide of potassium; and from that time to the present (though I had often wondered when I should be called to see the child again), he has remained in good health. The history of the case puzzled me then, as the mother appeared perfectly healthy, until one day, calling when the father was at home, I found his voice shrill and cracked. During my recent attendance, I found that the mother had miscarried two or three times since, without definite known cause. It was, however, only the other day that, on putting a rather close question to the father, he told me that, when I had first seen his child, six years ago, he wondered why I had given it mercury then, as he did not suppose it possible that any taint could have been conveyed after so long a time. He then said that, at least, thirty-five years ago, he had a bubo, yet he had no other secondary symptoms, no rash whatever, and that he had considered himself quite well.

The question that arises with regard to the present case (that of the child) is, whether it is a case of tubercular meningitis, the tubercular cachexia arising out of the malnutrition resulting from the syphilitic taint, or whether it is possibly a syphilitic deposit in the brain, setting up the inflammation in the eye and the other symptoms. Mr. Power said, with reference to the patch on the retina of the left eye, that it was more like one arising from syphilis than tubercle; whereas Dr. West and Dr. Dickinson said that they had never known true syphilitic deposit in the brain in so young a child. If it were ordinary tubercular meningitis, the child ought to have died in a few weeks, instead of which, by a persistent course of treatment, eminently antisyphilitic, the progress of the case has been favourable as far as general health is concerned, though with the result of damage to the eye.

I have only to add to these comments by Dr. Heywood Smith, that they have my entire concurrence. The preceding case shows that meningitis may be set up in children by old-standing syphilitic disease of the brain, and removes the objection which prevented Drs. West and Dickinson from accepting this view when advanced by Dr. Smith. As Mr. Power states, moreover, the retino-choroiditis observed is suggestive of syphilis, and is not the kind of optic change to be expected as a result of tubercular meningitis, namely, optic ischaemia or neuritis.

CASE III. A child, aged 10 years, was brought to me in March 1873. She had the depressed nose and square head of congenital syphilis, and had no central incisors in the upper jaw. She was the first child by a second husband of a woman who had had eleven children by her first husband, not one of which had reached the age of three months, and most of them had been born dead or died soon after birth. The mother had never been well, but had had no distinct syphilitic symptoms. This child was suffering from slight hemiplegia, most evident in the arm. It was the third attack, and had come on suddenly with agitation of the arm, as had the two previous attacks; and, as in them, recovery was slowly taking place. I have not seen the case since.

[To be concluded.]

LECTURE

ON THE

USE OF THE CLINICAL THERMOMETER.

Delivered at the University of Glasgow.

By JAMES FINLAYSON, M.D.,

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AN increase in the heat of the body is one of the oldest and one of the most widely recognised symptoms of disease. It is only of late, however, that accurate estimates of such morbid variations have been made for the purposes of diagnosis and prognosis. The history of the introduction of this method of research, although important and instructive, would take too long to recount. Suffice it to say, that an appreciation of the temperature of the body is now recognised on all hands as supplying a sure gauge of the degree of pyrexia; and that in this respect it ranks along with the pulse, or even in many cases as superior to it. The measurement of the temperature is arrived at by means of a thermometer.

Clinical Thermometers are now made of various sizes, and may be had at various prices. Those of Casella and some other makers leave little to be desired in the matter of accuracy and elegance; but the cost and fragile character of the instruments now in use constitute still a serious drawback to their employment.

The object is to have an instrument with such a bulb as to be very sensitive to slight changes of temperature, and of such a size and shape as to be adapted for introduction into various parts. If it be not well made, changes in the glass are particularly apt to occur in the course of time, so as to introduce errors into the readings. The graduation should be on the stem of the instrument itself, and should be on such a scale as to allow of readings to a fifth of a degree Fahrenheit, or of a tenth centigrade. Self-registering maximum thermometers are now in chief favour in this country, and are made on Phillips's plan of having the upper portion of the mercury detached by an air-speck, so that it remains at the highest point to which it had risen, and the upper end of the index shows the maximum attained. Before being used, this index requires to be replaced so as to join the main column. This is effected by holding the instrument by the bulb, and shaking it down once or twice. Holding it by the bulb protects the instrument to some extent

from the danger of contact; and, further, the heat of the hand should cause the column of mercury to rise, and so prevent the detached index from being lost by being shaken into the bulb. Some instruments have a special arrangement to prevent this last accident. The advantage of a self-registering instrument is, that it does not require to be read in the position or at the time that the observation is made. Hence, for observations on patients in places where the light is bad, or where we might dislike to bend closely over the patient, or where we entrust the observations to others, registering thermometers are most valuable. Sometimes a pair of thermometers, duly marked, are left with a nurse or attendant, who has been instructed how to apply the instrument; and the readings may be made by the physician at his visit, and the indices set for a fresh pair of observations for the next night and morning.

When, however, we make the observations ourselves, a thermometer without any registering index is perhaps more useful, as showing at once any tendency of the mercury to fall after it may have reached a certain point, and so calling attention to some deficiency in the application of the instrument—due perhaps to the slipping out of the bulb from its proper place. For those who wish to watch the course of the mercury in such observations, the use of a sensitive thermometer without the complication of an index is especially instructive; and for this reason it is to be recommended to all beginners in the study of thermometry.

If the thermometer be well made, and if for the same patient the same thermometer be always used in the same way, the question of absolute accuracy in the graduation is not perhaps of much consequence in practical medicine. The importance and significance of the measurements usually depend on a *relative* rise and fall; and the indication of the records would be but little affected by having all the figures altered a quarter of a degree higher or lower. Still, for certain purposes, and indeed on general principles, it is desirable to have the instruments accurately graduated, so as to give results comparable among themselves; and, for this purpose, the best way is to have the instrument verified at Kew—obtaining a certificate of its accuracy, or of the amount and kind of its error at the various degrees in use. Any attempt to compare thermometers for yourselves will likely only mislead you, as the difficulties to be overcome in testing thermometers are considerable. The method of placing several instruments in a basinful of warm water is sometimes spoken of as serving to indicate the inaccuracies of clinical thermometers; but this may only indicate certain differences in the kind of bulb, etc. For example, a thermometer with a very large bulb of mercury may be introduced into warm water along with one with a small and narrow bulb, and the former may go on rising after the latter has reached its maximum and has begun to cool; or the different shapes of the bulbs may bring them into relation with different strata of the water, and so with different temperatures. For the sake of accuracy, therefore, a certificate from Kew should be obtained; and, if the thermometer be in use for some time, a further examination may be necessary, from the alterations brought on by age.

The parts of the body whose temperature should be tested are, the mouth, the axilla or groin, the rectum, and the vagina. Sometimes the heat of the urine, too, may be examined with advantage. Other parts of the body may be examined in special inquiries, as, *e.g.*, certain parts of the limbs on the two sides of the body in cases of one-sided paralysis, etc.; but the above are the localities to be investigated when we desire to have a result which may serve as an index of the internal heat. Each of the above localities has advantages and disadvantages; but, in any one case, uniformity in the series of observations is the overruling consideration which should affect our choice.

The *Mouth* is open to the fallacies caused by the air passing through this cavity, unless the person have at the time the intelligence and ability to breathe through the nose, with his lips kept closely shut. The *Axilla* often demands a long time before it can yield an accurate measurement. The patient's arm is sometimes too thin to cover in the thermometer with sufficiently vascular tissue; and there is often a restlessness which makes the restraint of holding the arm in one position for the necessary time seem too irksome. There is sometimes, moreover, a certain degree of doubt regarding the axillary temperature being a fair index of the internal heat. The *Groin* is open to the same objections as the axilla, but may sometimes be preferred in children whose arms are very scraggy. Measurements in the *Rectum* have the disadvantage of involving, except perhaps in the case of children, a somewhat indelicate proceeding, at least for anything like frequent or regular observations. The compression of the bulb by the bowel, and the presence of faeces, may produce some sources of variation. The solid faeces may impede the entrance or proper contact of the bulb; and fluid faeces may bring down matter from higher and warmer parts of the body than that which we aim at investigating. The *Vagina* is free from some of the objections urged against the rectum; but delicacy prohibits the use of this method, except perhaps in obstetrical cases. Moreover,