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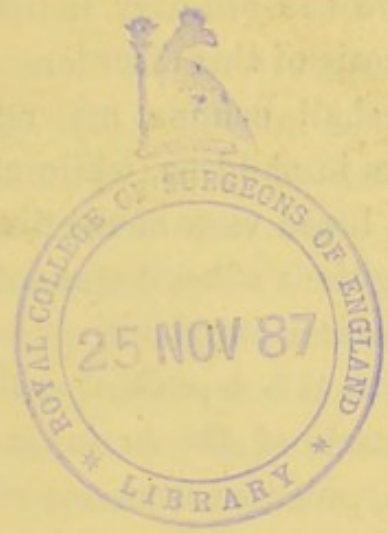

TUBERCULAR MENINGITIS AS IT OCCURS IN CHILDREN; WITH AN APPENDIX OF ILLUSTRATIVE CASES AND TWO CHROMO-LITHOGRAPHS.

By MARTIN OXLEY, M.D., *Consulting Physician to the Liverpool Infirmary for Children.*

TUBERCULAR meningitis is an affection of the brain depending upon acute miliary tuberculosis, and is generally accompanied by a deposit of nodules in and upon the lungs, pleura, liver, spleen, and kidney. The deposit on the vessels of the brain causes rapid exudation of lymph and serum into the subarachnoid space with effusion into the ventricles. This latter produces pressure on the brain, empties its vessels, and interferes with its functions. Thus symptoms which ordinarily accompany acute tuberculosis are masked, and life is extinguished before the deposit in the other organs produces any great change in their structure or office.

This preponderance of head symptoms has led to acute miliary tuberculosis, when accompanied by eruption of the nodules on the vessels of the brain, being very commonly described as a disease *sui generis;* and for this there is good

reason, as in every instance where the membranes of the brain are the seat of the miliary deposit, diffused and widespread inflammatory disturbance of the circulation in the brain rapidly supervenes, and the signs of the deposit in the lungs, liver, &c., are veiled, as also are the ordinary indications which usually guide us in our diagnosis of this disorder.

In this paper I shall confine my remarks to tubercular meningitis as it occurs in children, while at the same time endeavouring to take a broad view of the disorder, and keeping in mind that the meningitis is not a disease of itself, but one of the manifestations of a general complaint.

The manner in which this deposit of miliary tubercle is placed in and upon the vessels of the brain, is so well shown in a microscopic specimen, prepared from one of my cases by Mr F. Paul, that I have had a drawing made by my friend Dr Hyla Greves of the branch of the artery magnified five times, as also one of part of the vessel magnified 50 diameters, and another giving an excellent representation of one of the tubercles magnified 300 diameters. The following description will explain the drawings:—

Fig. 1. Branch of meningeal artery, five times the natural size, showing miliary tubercles scattered along the walls of the vessel. At (*a*) the tubercular nodule entirely surrounds a small branch, at (*b*) they are situated at the side of the vessel.

Fig. 2. Part of the same vessel magnified 50 diameters. The relationship of the tubercle is well shown. The wall of the artery in the immediate neighbourhood of the tubercles (*t*) is seen to be infiltrated with small round cells similar to those of which the tubercles themselves are chiefly composed; this, however, is better shown in fig. 3.

Fig. 3. One of the tubercles magnified 300 diameters. The tubercle is seen to be composed of an aggregation of embryonic or lymph corpuscles in the vessel wall.

The deposit of miliary tubercle, as well as the amount of lymph exudation, varies very much in different cases, and as a consequence we have great diversity in the lesions of the brain and membranes. At one time only a few nodules will be

found, at others the pia mater will be crowded with them. The Sylvian and longitudinal fissures are often so firmly glued together that the brain on either side cannot be separated without tearing its tissue. The base may be covered with purulent lymph, obscuring the cranial nerves and sulci, or we may have only a slight milkiness of the membranes. Masses of tubercle in various stages of the tubercular condition are frequently found in the substance and on the surface of the brain. In 41 cases which I have examined after death 19 had only a slight opacity of the membranes, while in 22 there was a well-marked deposit of yellow lymph; in 9 instances caseating masses were found, forming in 4 cases single, and in 5 two or more, tumours. In every instance there was a great excess of fluid in the ventricles, the effusion being serous in character with one exception, where it was mucilaginous.

Causation.—In considering the cause of tubercular meningitis, I will refer briefly to the most recent views on the subject of tuberculosis, the complaint under consideration being one of its manifestations.

MACALISTER, in his *General Pathological Anatomy*, says:—"The term tubercle was formerly applied to all varieties of nodular growth. Baillie (1794) and Bayle (1810) were the first to direct attention to the grey miliary nodules which we now call tubercles." Laennec applied it mainly to the cheesy masses found in phthisical lungs. Larger caseous foci and caseous lobular infiltrations were also described as tuberculosis. "The caseous nodes and masses were simply 'tubercles'; the diffused infiltration was 'tuberculous infiltration'; the grey nodules (or true granulative 'tubercles') were 'miliary tubercles.' Cheesy change was thus made the main characteristic of tuberculosis." "In opposition to this view, Virchow maintained that caseous masses might arise in many different ways, and hence had very various significance in different cases." In consequence of the recent investigations of Koch, the definition of tubercle will probably have to be amended. "He announced in 1882 that the tuberculous virus is a special bacillus, and that he had found it in general miliary tuberculosis, in caseous pneumonia, caseous

bronchitis, intestinal and glandular tuberculosis, 'pearly disease,' spontaneous and inoculated tuberculosis in various animals, and in the so-called scrofulous hyperplasia of lymphatic glands." "The virus which engenders tubercle may be carried out of the lymphatic system into the blood, either from a tuberculous focus in a gland or a tuberculous ulcer in the thoracic duct. It may thus be conveyed to distant organs." As a result, "the various organs are beset more or less densely with minute (miliary) grey or translucent nodules, or here or there with yellowish-white opaque nodules with cheesy centres. This is the case whether the affection extends to several organs or to one, or even to a single arterial territory within an organ."

I will not attempt to give an opinion upon the causation of tubercle or to define what it is, but will merely refer to what I have noticed in the cases upon which this paper is based.

In forty out of forty-one of the cases of which I have notes, and in which a *post-mortem* examination of the whole body was made, there was cheesy deposit either in the bronchial or mesenteric glands, or tubercular deposit of the same character in the lung, liver, spleen, kidney, or bone. On several occasions old tubercle was found in the brain. Thus, if any theory which admits the infection from a tuberculous centre be accepted, we have not much difficulty in accounting for the deposit of miliary tubercle in the membranes of the brain.

Out of the sixty-three cases of which I have notes, not one is over the age of ten years, nor can I remember having seen one over that age in consultation. At the Children's Infirmary the patients are admitted up to the age of twelve years, and in private practice I have the opportunity of seeing and attending them to any age. Those of which I have particulars were aged as follows :—

	Cases.		Cases.
1 year and under,	3	5 years,	11
1½ „	3	6 „	6
2 years,	13	7 „	5
3 „	9	8 „	4
4 „	6	9 „	3

I give the table of age at this part of my paper, because I think the fact of no case whose age exceeded ten years having come under my observation during the past twenty-two years has an important bearing upon the question of causation. It is an undoubted fact that children under the age of ten are more liable to catarrh of the lungs and bowels than older subjects. This catarrh, moreover, is often very chronic, and leads to hyperplasia of the bronchial and mesenteric glands, and consequent cheesy formations in their centres. The theory of infection from foci being accepted, we have a sufficient explanation of the frequency of miliary tuberculosis in children. It is often stated that tubercular meningitis is brought about by over-study, poverty, bad feeding, &c. To this I cannot agree, as, proportionately, I have seen as many cases in those who have not commenced their studies, in the children of the rich or well-to-do, and in those who have been well and carefully fed, as in the children of the poor. I am inclined to the conclusion that there is a hereditary tendency to tuberculosis, and that this is a most important factor in the causation of tubercular meningitis. I have over and over again noticed that where a child who has had symptoms which seemed to warn one of an approaching attack of tubercular meningitis has survived and reached the age of ten or more, one of the many manifestations of the tubercular diathesis has declared itself in it.

Symptoms.—The signs which mark this complaint are the following:—The child, previously robust, is noticed to be failing in health, to be losing flesh, this loss of flesh being more noticeable in the body than in the face; it complains of being tired, shows a disinclination to play, wants to lie down, soon tires of its toys, is unusually fretful and irritable, or becomes morose; sleep is disturbed and interrupted by horrible dreams, which cause it to start up in bed crying out in alarm. There is loss of appetite, slight cough, occasional attacks of vomiting, and diarrhœa alternating with obstinate constipation. Pain in the head is complained of. If the pulse and temperature are taken, a slight rise will be noticed, especially at night. These premonitory symptoms last for some months with periods of apparent good

health, when suddenly vomiting, apparently causeless and without nausea, takes place, or a convulsion occurs followed by strabismus or paralysis of some group of muscles, or delirium sets in, sometimes of a violent character. Pain in the head is now very marked, the headache is continuous, with exacerbations of great severity, and the characteristic hydrocephalic cry is almost constant; the patient is drowsy, and has to be roused to take food or answer questions. The pulse is irregular, 80 or 90 to the minute, while the temperature rises to 99° or 99°·5. Then the drowsiness deepens, the pupils become unequal and sluggish, convulsions succeed one another, the hydrocephalic cry becomes frequent and piercing; congestion of the optic discs may now be observed, while the paralyses become more marked. This condition may last from two to ten days, when the stupor deepens, the pulse is quickened to 120 or 160 and is regular, the temperature rises to 100° or 102°; the respiration is irregular and sighing, swallowing becomes difficult, the bladder and bowels are evacuated unconsciously, the muscular system relaxes, and the pupils dilate widely. The temperature now rises to 102° or 106°, and the patient dies comatose. Frequently during the last few days an apparent improvement will take place, food may be swallowed, and the tongue put out when the patient is asked to show it. He may appear to recognise friends, and give those who are watching the case a fallacious idea of improvement. But this seeming change for the better will not deceive the experienced, as the pulse will indicate the real state of the case by remaining small and frequent. The following is a good instance of this delusive improvement:—A boy, aged 8 years, was admitted into the Infirmary for Children in 1876; he became unconscious on 30th March, and was unable to swallow; on April 1 he had the rattle in his throat, and seemed to be dying; pulse 140. On April 2, the day on which he died, he became conscious, and put out his tongue when asked to do so. He remained sensible to within five minutes of his death. but his pulse during this time rose to 160, and was almost imperceptible at the wrist.

In the above description are included all the prominent

symptoms which mark the course of this disease, but I would refer the reader to the cases which are tabulated in the appendix to this paper for further points of detail. The lesions are very varied, and the early symptoms must follow on the lesion. The more sudden and rapid the effusion into the ventricles, the sooner death takes place. Occasionally the delirium is of a maniacal character, as was noticed in a boy, aged 5 years, who, before the disease was recognised, became suddenly sullen, then very violent, biting and swearing, and died in eight days with the usual symptoms of meningitis. In this case, in addition to the miliary tubercle in the pia mater, the base was covered with tough yellow lymph.

Vomiting is nearly always the initial symptom; and when it occurs in a child under ten years without any apparent cause, and is not accompanied by nausea, it ought to lead to a careful examination of the pulse and temperature. If the former be irregular, not above 90 or 100, and the latter a degree above normal, and a history of any of the premonitory signs—headache, disturbed sleep, &c.—is elicited, tubercular meningitis must be suspected. The commencement is often very insidious, and in many cases which have come under my notice my attention has been called casually to a child during a visit to another inmate of the house, the child being reported merely to have had a bilious attack. In ten days or less it has died comatose. It is these cases which take us by surprise. The doctor is sent for, or, in course of a visit to another patient, is told that a little girl or boy does not seem well, and has vomited; the vomited matter is examined, and is found to be such as a hearty child's stomach would contain,—perhaps plum-cake or plum-pudding; a dose of medicine is ordered, and the patient is declared to be suffering from disordered stomach. The vomiting continues, the child becomes drowsy, and every one connected with the case is taken by surprise when the announcement of the fatal character of the complaint is made. On the other hand, where convulsions usher in the attack, the diagnosis is made more easily, and the friends are warned at an early period of the gravity of the situation.

Typhoid fever in children often simulates tubercular menin-

gitis so closely that even an experienced observer may be deceived. I have on several occasions seen cases in which it has been difficult to differentiate between these two diseases, dissimilar as they usually are. The most important point to bear in mind is, that in typhoid there is increased frequency of the pulse, which is also regular in rhythm; in tubercular meningitis the pulse is seldom over 90, and is irregular; in typhoid the temperature is higher than in tubercular meningitis. In the latter we seldom have a higher temperature at night than 101°, and more often it is 99°, or a few points above that. The belly is retracted in tubercular meningitis, not so in typhoid. A case of typhoid which I saw last year in a little girl, aged 7 years, is worth recording as an instance of the great similarity there is at times between the two complaints, particularly in the prodromata. The child had measles two years previously. The parents noticed that during the last month she had been getting thinner. Two weeks before her illness was manifest she came home from school saying that she had fallen and hurt her side. For the next two days she *vomited her food* and staggered when she tried to walk, but *did not complain of her head;* she grew worse, and *started up in her sleep, screaming,* throwing her head back, and from side to side. She seemed to labour under delusions, and had a short, constant cough, which is never met with in meningitis. Temp., 102°; pulse, 128. She afterwards developed the usual typhoid symptoms, and made a good recovery. In this instance I was led to diagnose typhoid by the state of the pulse, the temperature, and the frequent cough, while the child was in a semi-conscious condition. At times we may meet with a case like the following, where it is almost impossible to come to a correct diagnosis. A boy, aged 5 years, had been ill for a week before he came under notice, with vomiting and general malaise. He was admitted into the Children's Infirmary. During his stay in the hospital he *vomited the first* day, but not afterwards; he lay in a *sleepy condition,* with an *irregular pulse of* 58. Temp., normal. Afterwards the pulse rose to 120, and was irregular; temp., 101°. He had *internal squint* just before death. On *post-mortem* examination the brain was found to be normal; no

tubercle nor lymph in the membranes, nor any excess of fluid in the ventricles. There were a few miliary tubercles in the apex of the right lung, and the bronchial glands were caseous. An abscess was found behind the trachea, and the pericardium contained four ounces of pus. In this case there was a deposit of miliary tubercle in the lung, and there was the caseous bronchial gland; but, in the absence of any abnormal condition of brain, I think we may conclude that death was due to suppurative pericarditis.

Temperature in Case of Acute Tuberculosis, with Effusion into Ventricles of Brain (Meningitis). M. C., aged 6 years.

1st day.	M. temp.	99·6°	Pulse	80	E. temp.	100·5°
2nd „	„	99·8	„	100	„	100
3rd „	„	98·4	„	82	„	99
4th „	„	100	„	80	„	99·6
5th „	„	99·6	„	108	„	99·6
6th „	„	98·2	„	96	„	98·2
7th „	„	98·6	„	156	„	Died.

Temperature in Case of Acute Tuberculosis, without Effusion into the Ventricles of Brain. E. B., aged 5 years.

1st day.	M. temp.	100·8°	Pulse	152	E. temp.	103·2°
2nd „	„	102·2	„	150	„	104·2
3rd „	„	103·2	„	150	„	104
4th „	„	102·8	„	160	„	104·2
5th „	„	102·4	„	142	„	104·3
6th „	„	102·2	„	160	„	104·5
7th „	„	102·2	„	160	„	104·2
8th „	„	102·2	„	164	„	104
9th „	„	103·5	„	160	„	104
10th „	„	102·6	„	142	„	104·5
11th „	„	102·2	„	180	„	104·2
12th „	„	102·5	„	176	„	103·8
13th „	„	102·5	„	180	„	104·2
14th „	„	102	„	184	„	103
15th „	„	101	„	190	„	102
16th „	„	101	„	—	„	101, died.

The way in which this affection of the brain modifies and alters the pulse, temperature, and duration of general miliary tuberculosis is well shown in the preceding table; the ages of the children were respectively six and five years. The report of the elder child, who had tubercular deposit in the membranes of the brain, with effusion into the ventricles, is as follows:—On May 1 she vomited her dinner, and at the time it was thought to be the result of eating to repletion, as up to then she had been considered healthy. After the vomiting she became restless and drowsy, complaining of headache. On the third day of illness she was admitted to the Children's Infirmary. On the fifth she complained constantly of headache, and was quiet and listless. Pulse, 96, irregular; temperature, 100°. In the afternoon she had a convulsion. The disease ran the usual course, and she died on the tenth day (*see Table for particulars of pulse and temperature*). *Post-mortem* examination revealed miliary tubercle in the choroid and velum interpositum; a small nodule of tubercle, the size of a pea, in the middle of the corpus callosum on the left side; one about the same size in the right anterior frontal convolution. Lungs free from tubercle; surface and substance of spleen studded with tubercle, as was the adjacent peritoneum. Liver and diaphragm in contact with it also covered with tubercular nodules of same description. The report of the younger child is as follows:—An intelligent, old-fashioned child, said to have been ailing for some time. Was drowsy and fretful when admitted, had hectic flush on left cheek, and complained of great thirst. Pulse, 150; respiration, 50; temperature, morning, 101°; evening, 103°. Had slight cough and râles over both sides of the chest, and complained of pain in the abdomen. She lived fifteen days, having a morning temperature of 102°; evening, 104° to 104°·5. The pulse from the first was 150 to 180, and the chest symptoms were marked. There was constant cough and great thirst. After death the lungs, spleen, and liver were found studded with miliary tubercle. The membranes of the brain were free from tubercle or lymph, and there was only a slight excess of fluid in the ventricles. Simple meningitis is so like in all its characteristics to the

tubercular variety that I think it would be impossible to distinguish between them, the prominent symptoms being due in both to the effusion of lymph and serum upon the surface and on the ventricles of the brain. The invasion is perhaps more sudden, and the course shorter. The following will corroborate the above statement:—A boy, aged 9 years, complained of headache on October 13. Before this he had appeared quite well. Vomited two or three times, and became unconscious by night. Four weeks before this he had convulsions, and arched his back. On admission he was unconscious, but constantly cried out (*hydrocephalic cry*). Pulse slow and irregular, bowels relaxed. On the 14th he had opisthotonos; on the 15th was less noisy; on 16th lay quiet, with muscular system relaxed, and quick pulse, and died at 8 P.M. After death lymph and pus were found in and upon the membranes at the base; the under surface of the cerebellum was covered with lymph and pus; the ventricles were distended with fluid, but no tubercle was found in the brain or other organs.

Treatment.—Unfortunately, treatment in acute hydrocephalus is most unpromising, and all who have had extensive experience in the treatment of this disease have had the same disappointing results. Iodide of potash, bromide of potash, blisters all over the scalp, and bleeding with leeches have been tried, but nearly always in vain. Notwithstanding the almost invariably fatal character of the illness, there are occasional recoveries, and they must cheer us on to try what the physician's art can do in this deadly disease, removing, as it often does, the brightest of the family, and that at a time when the child is most interesting to its parents.

Out of all the cases which I have had that were seen after well-marked and unmistakable signs of tubercular meningitis had declared themselves, only one in private practice has recovered to grow up into womanhood, and one in hospital living for one year, when a second attack occurred and death resulted in eight days. These instances are sufficiently instructive to relate, as in the first there was the death of a sister aged sixteen months from the same complaint, and the recovery of

another sister who had all the premonitory signs. In the second, where death took place, tubercle probably deposited in the previous attack was found after death from the second. I will briefly report these cases. The first one of recovery, after entering upon the second stage of the disease, is as follows:—Girl, aged 7 years, seen in November 1874. Has complained of being tired during last few days. Last night, mother noticed that her manner was peculiar, and that she complained of headache. This morning (November 4) she vomited and had some diarrhœa. I found the child in a lethargic condition, with foul tongue; pulse 94, irregular; temperature, 98°·4; pupils sensitive to light. Answered questions with reluctance; while I was with her she vomited. Next day (November 5) she was more drowsy, temperature 98°·4. November 6.—Still drowsy; pulse, 86; temperature, 96°. November 7.—Had a slight convulsion last night, went quite stiff; pulse, 76; temperature, 98°·4; cried out with pain over the left temple. November 7, 8, and 9.—Pulse, 62 to 72, irregular; temperature, 98°; remained in the same deeply drowsy condition, taking no notice of anything, but uttering piercing screams, which could be heard outside in the street. November 12.—She was seen at this time by Dr Grimsdale in consultation. We blistered her over the left temple (the seat of pain), and administered chloral and bromide of potash instead of the iodide of potash which she had been taking, more with a view to quiet her and subdue the piercing and frequent cry than with the idea that it would have any curative effect. After the second dose of chloral she fell asleep and awoke free from pain. She went on improving until the 15th, when she was sufficiently recovered to be able to get up and be about. She now seemed to have lost the power of expressing herself, and had to be taught again the names of familiar objects; her intellect, which was previously above the average, seemed weak. She is now seventeen years of age, is well grown, but incapable of mental work, showing rather a want of ability to apply herself than any actual imbecility. One sister of the above died with well-marked meningitis at the age of sixteen months. Another sister, at three and a half years, had the following symptoms, which are so

typical that they are worth recording, complete recovery having taken place:—Mother noticed that during the last two months she had been fretful, soon tired, and did not sleep soundly. During last week she started up in her sleep, stared about her, and screamed. The skin grew hot and dry at night, and this was succeeded by shivering and restless sleep; she started up in her sleep and cried out, "Oh, my head!" at the same time striking it back and front with her hands. During sleep her hands and mouth twitched. (This was in September 1867.) She was put under a course of iodide of iron and cod-liver oil, with a dose of bromide at night, and now, in 1885, she is in fairly good health, although of an exceedingly nervous temperament. The case which I have mentioned as having survived one attack only to succumb to a second is shortly thus:—Female, aged 7 years, was in the Infirmary for Children, May 1883, when she had all the symptoms of tubercular meningitis, being unconscious, and suffering from severe convulsions. She was readmitted in May 1884, again suffering from the same symptoms, and died at the end of eight days. On examination after death the usual signs of tubercular meningitis were found, and, in addition, a caseous nodule at the vertex, in a shallow fissure about the middle of the right side, close to the longitudinal fissure in the pia mater. Another, the size of a pea, was found in the left tempero-sphenoidal lobe. WEST seems to have had a very similar experience to mine. He says:—"Once I saw recovery take place after the second stage of tubercular meningitis had commenced, and I once watched with surprise the gradual subsidence of the disease, though convulsions had already taken place, and had been followed by coma. In that instance the child, three and a half years old, was a member of a phthisical family, and her younger brother had died the year before of hydrocephalus. The disease in her case ran its ordinary course unchecked by the customary treatment. Convulsions took place, coma succeeded them, the pupils were dilated, the pulse was feeble and very frequent, and everything portended speedy death. Food was given, as the power of swallowing was not entirely lost, and ammonia with ether was administered, which, after a time, was exchanged for

quinine. For days unconsciousness continued, and the first voluntary effort was shown by the child raising her hand to steady the cup that was put to her lips. The power of speech was not regained for some weeks, nor that of walking for many months. When I last saw her three years had elapsed. The child, though not deficient in intelligence, had never regained flesh nor recovered the look of health, nor the manners of a child, but walked about unsteadily with a vacant smile."

Notwithstanding the very fatal character of tubercular meningitis after it has reached the stage when its diagnosis cannot be doubted, I should never hesitate to put the patient under full doses of iodide of potash combined with bromide or chloral. I would at the same time blister the nape of the neck, as also the scalp, if the pain were complained of at one spot. The case I have mentioned, and others which have been recorded, are sufficiently encouraging to make one try remedies which cannot possibly do harm, and which may be instrumental in saving life. In the premonitory stage, where the symptoms are such as I have described, and where recovery was perfect, we have every encouragement to direct careful and systematic treatment of a tonic and sedative character, with attention to diet and hygiene. Cod-liver oil, combined with iodide of iron, has been most useful in my hands, with a dose of from 15 to 30 grains of bromide of potash or soda at bed-time, where night terrors are very marked. In some cases I have found a few drops of liq. arsenicalis, or the liq. hyd. bichlor., a useful tonic, alternating these with one or other of the preparations of iron. Every care must be taken to ascertain when the child shows symptoms which indicate falling off in health, or change of disposition, and the parents ought to have them described to them, so as to give the medical attendant timely warning.

In conclusion, I would call attention to the following points:— (1) Tubercular meningitis is not a disease *per se*, but owing to the fact that effusion into the ventricles of the brain, when excessive, produces death rapidly, it is convenient to consider separately this phase of tuberculosis. (2) The effusion into the ventricles is caused by occlusion of the vessels by nodular

growths of tubercle in their walls. (3) The disease is rare after the age of ten years. (4) Great attention is to be paid to prophylaxis. Any sudden change in the disposition of a child should be noted, and a careful examination of the pulse and temperature made. (5) Exertion of the brain does not bring about tubercular meningitis. The confinement in a close room, or the worry of lessons, may produce nervous exhaustion, and a child with a phthisical family history may develop tuberculosis in consequence, but not necessarily meningitis; as a matter of fact, as large a number of children under ten years die of this disease before the age when school is begun as after. Lastly, an important point is brought out by the *post-mortem* examination of the cases tabulated in the appendix, viz., that the tubercular condition of the brain is nearly always associated with a case-ating centre from which infection may take place, the vessels probably being the carriers of the infecting material.

Appendix of Illustrative Cases.

No. 1 to 41. Cases of Tubercular Meningitis.
No. 42 and 43. Cases of Simple Meningitis.
No. 44 to 46. Cases of Meningitis, where the invasion was sudden and prodromata were slight.

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
1.	M.	8 years.	10 days.	... ...	None.	Choroid, lungs, liver, kidney, and spleen full of miliary tubercle. Under the microscope the nodules were well seen in and surrounding the walls of the vessels. Large amount of fluid in the ventricles.
2.	M.	2 years.	3 days.	Cheesy mesenteric glands.	None.	Recent lymph on the vertex and at the base of the brain. Miliary tubercle in the membranes at base. Effusion into the ventricles. Miliary tubercle in lungs, liver, spleen, and mesentery.
3.	F.	2 years.	17 days.	Cheesy mesenteric glands.	Had been ill for some time with diarrhœa and ascites. Had all the usual symptoms of meningitis.	Miliary tubercle in membranes at base of brain. Ventricles distended. Lungs, liver, spleen, kidney, and peritoneum studded with tubercles. Peritoneum intensely inflamed.
4.	M.	7 years.	5 days.	Cheesy mass at apex of right lung.	A well-made intelligent boy. Has worked hard at school and gained prizes. Latterly had become irritable. Phthisis is well marked on his mother's side. Course, the usual one.	Base covered with lymph. Miliary tubercle in the membranes everywhere, choroid and velum studded with them. Large effusion into ventricles. Lungs, spleen, and kidneys contained miliary tubercle.

Appendix of Illustrative Cases—continued.

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
5.	M.	1½ years.	5 days.	Tubercular peritonitis, with cheesy mesenteric glands.	Well-nourished. Had been in hospital under treatment for ascites four months before; had two quarts of fluid withdrawn; after this, made a good recovery and went home. When admitted had severe convulsions, and died comatose.	Miliary tubercle in membranes of the base and in Sylvian fissures. Effusion into the ventricles. Upper surface of liver adherent to the diaphragm; intestines matted together.
6.	M.	5 years.	11 days.	Deposits of softened tubercle in substance of brain.	None.	Miliary tubercle in membranes at base. Throughout the brain were small oval-shaped deposits of tubercle, surrounded by a zone of softened brain tissue. Ventricles distended with fluid. Left lung solidified, and section showed numerous small cavities filled with pus.
7.	M.	5 years.	13 days.	Tubercular masses in lungs and kidneys.	None.	Miliary tubercle in membranes at base and in Sylvian fissure. Large effusion into the ventricles. Nodular tubercle in the lungs, surface of pleura, diaphragm, liver, spleen, and kidneys.
8.	M.	2 years	11 days.	Bronchial glands cheesy.	None.	Copious effusion of lymph at base and all over surface of brain. Miliary tubercles in membranes at base and in fissures. Large effusion into ventricles. Cavity in apex of right lung, spleen, and rest of lung studded with tubercle. Mesenteric glands enlarged.

Appendix of Illustrative Cases—continued.

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
9.	M.	4 years.	2 days.	Tubercle in lung and bronchial glands.	Had been failing in health for eight months; always been delicate. Has had fits and attacks of vomiting, with intervals of comparative health. When brought to the infirmary was insensible, with dilated pupils.	Deposit of lymph over the optic tract. Miliary tubercle deposited over the base and in fissures of Sylvius, which were glued together. Large quantity of fluid in ventricles. Miliary tubercle in lungs, liver, spleen, and on under surface of diaphragm.
10.	M.	5 years.	13 days.	Mesenteric glands cheesy.	None.	Miliary tubercle and lymph effused over base in membranes and fissures. Tubercular nodules in lungs, liver, spleen, and kidneys.
11.	M.	5 years.	4 days.	Cheesy bronchial glands; one softened in centre.	Seven days before admission disposition suddenly changed; formerly was bright and precocious, became very violent, biting and swearing. Is sullen when spoken to; tries to bite; answers questions shortly but rationally. Convulsions became frequent. Died comatose.	Base of brain covered with tough yellow lymph. Membranes crowded with miliary tubercle. Large amount of fluid in ventricles. Nodular tubercle scattered throughout lungs and on surface of pleura.
12.	M.	7 years.	36 days.	Tuberculosis of lung.	None.	No lymph at base, membranes milky. Miliary tubercles in membranes. Large effusion into ventricles. Lungs, pleura, spleen, and peritoneum studded with tubercle.
13.	F.	5 years.	9 days.	Cheesy mesenteric glands.	None.	No lymph on membranes of brain. Numerous miliary tubercle in the pia mater at the base and in the fissures. Effusion into ventricles, lungs, spleen, and mesentery studded with tubercle.

Appendix of Illustrative Cases—continued.

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
14.	F.	4 years.	4 days.	Tubercular mesenteric glands.	None.	Thin layer of lymph covering interpeduncular space, pons, and medulla. Miliary tubercle in pia mater at the base, and in fissures of Sylvius. Large effusion into ventricles. Tubercular nodules in and on lungs, surface of pleura, spleen, and peritoneum.
15.	M.	2 years.	12 days.	Tubercular lungs and bronchial glands.	None.	Body emaciated. Miliary tubercles on base, and in Sylvian, and longitudinal fissures. Large effusion into ventricles. Nodules of tubercle in lungs, liver, and spleen, lungs and spleen being studded all over and in their substance.
16.	F.	5 years.	9 days.	Thymus or mesenteric glands caseous.	Had cough and been failing in health for two months. A week before admission had severe convulsions lasting three hours. Now rambles at night. Pulse, 140; temp., 102°·5. Slight external squint. Died comatose.	Body emaciated. Large quantity of miliary tubercles in membranes of brain; also large effusion into ventricles. No lymph was thrown out. Lungs, spleen, and mesentery crowded with tubercular nodules. Mesenteric and thymus glands tubercular.
17.	M.	4 years.	13 days.	Thymus caseous.	None.	Body emaciated. Membranes at base and in fissures crowded with tubercle. Large effusion into ventricles. Lungs, liver, spleen, and kidneys contained miliary tubercle.

Appendix of Illustrative Cases—continued.

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
18	F.	9 years.	14 days.	Tubercular mass in substance of brain.	Complained of headache and drowsiness fourteen days before death. Has had good health, but lately has been easily tired. Had a peculiar gait. Became delirious and then unconscious with frequent convulsions. Optic neuritis marked. Temp., M. 99°; E. 100°·5. Last two days, M. 100°·5, E. 102°. Pulse, 116, last three days 160.	Miliary tubercle in membranes at base and in Sylvian fissure. Tubercular tumour, size of hen's egg, in lower part of frontal lobes, uniting the two hemispheres; tumour almost cartilaginous in parts, and was surrounded by a zone of softened brain. Ventricles full of fluid. No tubercle discovered in any other organ.
19.	F.	3 years.	5 days.	Tubercular nodule in wall of left lateral ventricle, size of bean.	Was admitted on account of vomiting and general debility. Vomiting ceased after first two days, when stupor, squint, and coma were followed by death.	Body emaciated. Miliary tubercle in membranes at base and in Sylvian fissures. Layer of lymph over base and medulla. Caseous mass, size of bean, in wall of left lateral ventricle. Large effusion into ventricles. Left pleura adherent. No tubercle discovered in any of the organs.
20.	M.	6 years.	14 days.	Abscess of right lung.	Was admitted with signs of early hip disease. Began with persistent vomiting; this was accompanied by restlessness; some days before death became comatose having *intervals* of consciousness.	Miliary tubercle at base and in Sylvian fissures; the latter were adherent. Slight amount of fluid in ventricles. Right lung contained three cavities filled with pus; right pleura adherent.
21.	M.	5 years.	8 days.	Bronchial and mesenteric glands cheesy.	Was admitted with stupor and delirium; temp., 101°. Became unconscious and died.	Miliary tubercle in membranes at base and in fissures. Ventricles distended with serum. Lungs, liver, spleen, and kidneys contained numerous nodules of tubercle, the kidney one the size of a pea.

Appendix of Illustrative Cases—continued.

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
22.	M.	1½ years.	12 days.	None noted.	Illness began with vomiting, which lasted four days. Two days later had convulsions, continuing for two hours. Took food during this time eagerly. Was unconscious during last six days. Left pupil dilated and insensible, right internal squint.	At the base were numerous miliary tubercles, as also in fissures of Sylvius. Ventricles distended with serous fluid. No tubercle noticed elsewhere.
23.	F.	7 years.	12 days.	Caseous nodule in right corpus striatum.	Had been suffering from vomiting and convulsions a week before admission. During last six days had convulsions, more especially of left arm. Had distinct optic neuritis.	Caseous deposit in left Sylvian fissure. Miliary tubercle in membranes at the base and between the convolutions. Nodule, size of pea, in right corpus striatum. Slight distension of ventricles. Lungs crowded with miliary tubercle. Spleen and kidney contained a few nodules.
24.	F.	2 years.	12 days.	Tubercular nodule size of split pea in kidney.	Had been ailing for three months after an attack of measles; previously healthy; family history good. On admission had slow irregular pulse, hydrocephalic cry, squint, contraction of the muscles of the neck. Four days before death had convulsions. Left optic disc showed commencing neuritis.	Opacity of membranes at base, where they contained miliary tubercle. Ventricles distended with fluid. Few miliary tubercles in lungs, spleen, and kidney. The last contained nodule of cheesy tubercle.
25.	F.	8 years.	14 days.	Caries of spine.	Has angular disease of spine. Vomiting began a few days before admission. Other symptoms of meningitis with effusion came on, and she died comatose. No optic neuritis was observed four days before death.	Body greatly emaciated. Membranes at base milky, and contained large number of tubercular nodules. Tuberculous mass, size of bean, in cerebellum. Miliary tubercle found in lungs, liver, spleen, and kidney. In the last was nodule size of a pea.

Appendix of Illustrative Cases—continued.

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
26.	M.	6½ years.	10 months.	Tubercle in cerebellum.	First complained of headache, then became ataxic, and soon lost the use of his limbs. Frequent vomiting. Had optic neuritis in December; at end of January had atrophy of discs. Was drowsy, but intelligent. When roused would answer questions correctly. Became much emaciated. The sutures opened, and the head became larger day by day. Took food well almost to the last. Pulse varied from 80 to 100.	Body emaciated. Longitudinal and frontal sutures open about ¾ of an inch. Moderate amount of lymph effused at base. Miliary tubercle in the membranes. The whole of left lobe of cerebellum was occupied by a tubercular mass. The ventricles were greatly distended, containing about a pint of serum.
27.	M.	3 years.	15 days.	Bronchial glands caseous.	Has been unwell for last three months. For past three weeks has been occasionally sick, and starts up in his sleep. When admitted was well nourished and intelligent. Complained of pain in his head; occasionally screams. No optic neuritis. Pulse 76, irregular. Second day face was flushed. Had internal squint. Later, became less intelligent, drowsy, and emaciated. Would take no food; vomited occasionally. Last few days had opisthotonos, slight convulsions. Unconscious during last two days. Temp. 100° to 102°; last week sub-normal.	Thin layer of lymph at the base. Miliary tubercles in membranes at base and in Sylvian fissures. About ½ pint of fluid in the ventricles. Pleura, lungs, liver, and spleen studded with tubercle, also peritoneum opposing liver and spleen.
28.	F.	6 years.	18 days.	Hip disease.	Hip had been excised and the wound had healed, when she began with persistent vomiting, and complained of great pain in head. A few days before death optic neuritis was observed. Died with usual signs of effusion.	Slight amount of lymph at the base. Membranes here contained numerous miliary tubercles, as also those in Sylvian fissures. Slight increase of fluid in ventricles. Lungs crowded with miliary tubercles. The liver and spleen contained nodules, and the kidneys had a few deposited on their surface.

Appendix of Illustrative Cases—continued.

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
29.	F.	1 year 10 mths.	21 days.	Disease of middle ear, or caseating nodule in right lung.	Has suffered from otorrhœa most of her life. Fourteen days before admission complained of headache, and vomited. On this ceasing she gradually became comatose, occasionally uttering the hydrocephalic cry. Became much emaciated. Had optic neuritis.	Lymph at base, also between cerebrum and cerebellum. Numerous miliary tubercles in membranes at base and in the fissures. Ventricles much distended with serum. Yellow caseous mass at apex of right lung on the surface. No tubercles in it or the opposite lung. Few tubercles in spleen. Mastoid cells full of fetid pus.
30.	F.	7 years.	8 days.	Caseous bronchial glands.	Was a patient in the infirmary a year ago, suffering from severe epileptiform fits of left side. She had then constipation and vomiting, but went out apparently well. When admitted had vomiting; convulsions on her right side. Soon became comatose, and died with usual symptoms of effusion.	Small amount of lymph about the optic commisures. Miliary tubercle in Sylvian fissures and in choroid. Caseous nodule at the vertex, on the right side, close to the longitudinal fissure. Another, the size of a pea, was found in the left tempero-sphenoidal lobe. Large effusion into ventricles. Tubercle in both lungs.
31.	F.	3 years.	10 days.	Caseous bronchial glands.	Began with headache and vomiting, followed by convulsions. Had double internal squint, tonic spasm of right hand and leg; dilated and insensible pupils.	Yellow lymph and miliary tubercle in left Sylvian fissure and over convolutions bordering it; also over left optic nerve and left side of the optic commissure. Excess of fluid in the ventricles. Lung, under surface of diaphragm, liver, and spleen, seat of miliary tubercle.

Appendix of Illustrative Cases—continued.

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
32.	F.	6 years.	12 days.	Caseous bronchial glands.	Had pain in the head and vomiting; on second day convulsions, recurring two days later. When admitted to infirmary was drowsy, the abdomen retracted, pupils dilated, sensible to light. Pulse 80, irregular; temp. 100°·5. Delirious for next two days, screaming loudly. Third day ptosis of left lid, left pupil dilated, right arm and leg paralysed. Fourth day eyes examined by ophthalmic surgeon; no optic neuritis. Stupor deepened. Died comatose. Temp. 97°·5. Pulse 156 day she died. Pulse never over 96 until last two days.	Yellow lymph at base, in fissures of Sylvius, transverse, frontal, and fissure of Rolando. Veins of Galen blocked by recent clot. No naked eye tubercles were seen in brain. The ventricles much distended with fluid. Lungs, under surface of diaphragm, mediastinal glands, liver, and spleen, were the seat of miliary tubercle and caseating nodules.
33.	M.	2 years.	30 days.	Caseous bronchial glands.	Four months ago was seized with left hemiplegia and facial paralysis; had tubercular temp., 103° to 104°. When admitted had still paresis of left side, with clonic spasm and contracture. Gradually became thinner, unconscious, and remained for ten days in a semi-comatose condition and died.	On the right frontal lobe was a caseous mass, size of a pigeon's egg; the surrounding brain was gelatinous. On the left frontal lobe was a caseous nodule size of a walnut; brain round it gelatinous. Similar nodules in other situations, the right half of the cerebellum being nearly all caseous. Miliary tubercle in lungs and liver.
34.	M.	5 years.	6 days.	Caseating bronchial glands with pus in centre of largest.	Came into hospital eight months ago suffering from pain in head. Had a cough during last two months, with an evening temp. of 103°·5, drowsy; he was sent out better with normal temp., but drowsy. Came back into infirmary with signs of lung mischief, became comatose, and died in six days.	Miliary tubercle in membranes at base. Large quantity of fluid in ventricles. Lungs excavated and full of tubercles. Liver, spleen, and kidneys contained miliary and large tubercular nodules.

Appendix of Illustrative Cases—continued.

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
35.	M.	3½ years.	3 days.	Caseous bronchial glands.	Had been subject to convulsions since she was four months old, and has had fits off and on ever since. A few days ago she complained of pain in head, temp. 100°; gradually became comatose, with usual symptoms of hydrocephalus, and died; temp. rose to 104° before death.	Purulent effusion under the membranes at the base; membranes in Sylvian and longitudinal fissures studded with miliary tubercle. There was a caseous mass over corpus callosum; nodule, size of pea, on the right olivary nucleus; lungs, pericardium, liver, spleen, and kidney, seat of miliary tubercle, lung and spleen crowded throughout.
36.	F.	2½ years.	No record.	No record.	Has not seemed well for last six months; vomited frequently. Diarrhœa alternating with constipation. Phthisical family history on both sides. Father suffering from phthisis.	Body well nourished. Miliary tubercle in membranes at vertex and base. Lungs and spleen studded all over and throughout with miliary nodules.
37.	F.	3 years.	25 days.	Old tubercle in apex of left lung or disease of hip.	Had been under treatment for disease of hip. December 8th.—Was purged during the night; in the morning was quieter than usual. 10th, refused her food, had pain in head, and vomited; vomiting continued until 13th, temp. 98°·4, pulse 75 to 95, irregular. 15th, had convulsions during the night. Takes no notice, has internal squint. 17th, very restless, but unconscious. 18th, screamed constantly; temp. 100°·5, pulse 140. 19th, lies motionless, moaning. 20th, convulsed during night and morning, pulse uncountable. 21st, return of consciousness, took milk well; bowels open twice; temp. 99°, pulse 150. 22nd, again lapsed into unconsicousness. On 25th, had convulsions with oposthotonos and died.	Yellow lymph on the vertex and base. Miliary tubercle in membranes at the base and in Sylvian fissures. Large effusion into the ventricles. Miliary tubercle in lungs and spleen. Hip-joint was disorganised and full of pus.

Appendix of Illustrative Cases—continued.

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
38.	F.	4 years.	3 months.	Cheesy bronchial glands.	A year ago (March) her mother, on taking her out of bed, noticed that she had right facial paralysis and left hemiplegia. For a week she was unable to use the arm or leg; from this time she gradually recovered the use of the side, and in three weeks the paralysis was hardly noticeable. In December she began to lose power in her arm and leg, and her speech became affected; lately she has lost power over her bladder and bowels; when put on her feet turns round and falls. On admission (March) she cannot stand alone; if supported she trembles all over, her head moving from side to side. Voluntary movements of left arm and leg imperfect. When movement is attempted the limbs jerk about in a choreic manner; on exciting the muscles of the left arm or leg opisthotonos is produced; swallowing is interfered with, food being at times regurgitated. Speech imperfect. Optic discs normal. No want of intelligence; temp. 97°, pulse 95. At end of April she had a convulsion, afterwards squint, nystagmus, optic neuritis, vomited constantly, complained of pain in head, pupils dilated, and insensible; temp. 100°, pulse 200; in two days more temp. went up to 106°, and she died comatose.	Base covered with lymph; Sylvian fissures adherent. The corpus callosum, the velum, and choroid were adherent to a caseous mass in the right lateral ventricle. The tumour was the size of a large walnut, and was imbedded in the right optic thalamus. Another caseous mass was found in the left optic thalamus. The bronchial glands were cheesy. There were a few miliary tubercles in the lungs and spleen.
39.	M.	9 years.	7 days.	Caseous bronchial glands.	Brother died at three years of meningitis. A sharp intelligent lad. About the end of January complained of headache, in two weeks was	Pia mater studded with miliary tubercle at base and between the fissures. Ventricles greatly distended with fluid. Lungs and

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
					well. March 13th, he appeared dull and complained of headache, the same evening he was screaming with pain in the head; temp. 102°, pulse 84. 14th, delirious throughout night, sensible in the morning; temp. 101°, pulse 80. 17th, sleeps most of the time, does not know his mother; has paralysis of right side of face with ptosis; pupils equal, dilated but sensible; right arm paralysed; temp. 100°·6, pulse 80; quite unconscious. 18th, quite unconscious; pulse 104, evening it was 146; temp. 101°·2; remained unconscious, and died 20th; pulse 160 to 180; morning temp. 98°·8, evening 101°.	spleen studded with nodules of tubercle on surface and throughout substance.
40.	M.	8 years.	10 days.	Caries of spine or old tubercle in lung.	Father and mother died of phthisis. Has angular curvature of cervical vertebra; was in the infirmary for treatment of the caries by rest in bed. On March 22nd complained of headache, and vomited; pulse 120. 24th, seemed well again. 25th, vomited, and started up out of sleep suddenly; the bowels were relaxed, pulse irregular. 27th, had pain in head; pulse 61, irregular; temp., M. 99°·2, E. 100°. 28th, drowsy; pulse 58, irregular; temp. 99°·5. 29th, passes loose motions in bed unconsciously; paralysis of right face; evening pulse 96, regular; temp. 100°. 31st, unable to swallow, pupils regular and active; pulse 84. April 1st, rattle in the trachea; pulse 140; quite unconscious. 2nd, return of consciousness, puts out his tongue when requested to do so; pulse 160: remained sensible until five minutes before death, which took place to-day.	Miliary tubercle in great numbers in membranes, which could be seen distinctly to follow the course of the vessels. Large effusion into the ventricles. Remains of old and recent tubercle in apices of lungs; no tubercle in the spleen or other organ. Large abscess full of curdy pus in front of diseased vertebræ.

Appendix of Illustrative Cases—continued.

No.	Sex.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
41.	F.	6 years.	7 days.	Caseous mesenteric glands.	Well-nourished child. May 1st, vomited, attributed to having eaten too heartily; became restless and stupid, afterwards complained of headache. 5th, lies quiet and listless, has severe headache, no appetite, bowels costive; pulse 96, irregular; temp. 100°; had a violent convulsion, remaining unconscious until evening. 6th, sensible this morning, has headache, pupils evenly dilated; pulse 120 regular, temp. E. 101°. 7th, had a quiet night, eats better; pulse 140; temp. 99°, E. 100°; bowels acted freely all day and at night. 8th, had severe convulsions, with continuous movement of the limbs; pulse 140; temp. 99°·8. 9th, quite unconscious; pulse very rapid, temp. 100°·7. 10th, died comatose.	Large effusion into ventricles. A few miliary tubercles in the membranes at the base and in the choroid and velum. A small caseous mass was found, about the size of a pea, in the right anterior frontal convolution, and another about the middle of the corpus callosum on the left side. The lungs were normal, the spleen was full of tubercle, which also covered its surface and the adjacent peritoneum. Abdominal glands enlarged and caseous.
42.	M.	9 years.	4 days.	... ...	Well nourished. Complained of headache at 1 P.M. October 13th; before this appeared to be in good health; vomited two or three times, and at 8 o'clock became unconscious (four weeks previously had convulsions and arched back). On admission to the infirmary he was unconscious, but constantly crying out; pulse slow and irregular, bowels open. 14th, he was in same condition, but had opisthotonos. 15th, less noisy. 16th, lies quiet, muscular system relaxed; died at 8 P.M.; pulse during last two days 140 to 200.	Lymph and pus under and upon membranes at the base. The under surface of cerebellum covered with yellow lymph and pus. No tubercle was found in the brain or other organ. Ventricles of brain distended with fluid.

Appendix of Illustrative Cases—continued.

Sex.	No.	Age.	Duration of Illness.	Possible Centre of Infection.	Account of Illness.	Post-mortem Appearances.
43.	F.	4 years.	10 days.	... ...	A rachitic child, but otherwise healthy. On May 6th was exposed to rays of hot sun with a bare head, after this became drowsy and took no notice; temp. M. 99°·6, E. 100°·8; pulse 102; continued drowsy. On the 13th had a slight convulsion; E. temp. 100°·4; pulse 108. 15th, right side in state of clonic spasm; E. temp. 101°·8; pulse 140. 16th, became quite unconscious, and died in the afternoon; temp. 101°·8.	Yellow lymph was found covering the base, the surface of both hemispheres, between the convolutions and in the fissures of Sylvius, which were firmly adherent. The ventricles were much distended. Other organs healthy; no tubercle was discovered anywhere in the body.
44.	M.	4 years.	10 days.	... ...	Was ailing for some few days, had vomited once, and it was thought that the sea-side, where he was staying, did not suit him. Was sent home, and on the day I saw him he was drowsy and could not be roused. Pulse 92, irregular; temp. 99°·4. There was loss of power in the right side; had no convulsion. Pupils widely dilated during the last six days. Had the hydrocephalic cry, and ptosis of left eye. Temp. was 100°·8 until just before death, when it rose to 104°. The pulse quickened on the 4th day. On making inquiry, was told that this boy had been restless in his sleep, irritable, &c., during some weeks previously.	

Appendix of Illustrative Cases—continued.

No.	Sex.	Age.	Duration of Illness.	Account of Illness.
45.	F.	3 years.	7 days.	While in attendance upon the mother, was asked to look at the child who was said to be ailing. Had not seemed well during last month, having been restless in her sleep ; has been sick and purged. A well-nourished child, with pulse of 80, irregular ; temp. 99°·5. Drowsy ; next day was still sick and purged, and although drowsy was restless. She continued for two days in the same restless condition, sick occasionally ; gradually became unconscious, and died on the 10th day, after being in convulsions for ten hours.
46.	M.	3 years.	1 day 8 hours.	Well nourished. History of phthisis on father's side. Both parents are young and well. Was apparently in good health on the 23rd May. The mother had noticed that he was a little more troublesome to manage during the last week or ten days. Had been in Southport for an outing the day before, and seemed in the enjoyment of good health and spirits. On the morning of the 24th, at 4 A.M., he awoke out of sleep, called for his mother, vomited, and soon afterwards became convulsed, twitching his arms and legs ; at 5 A.M. he was insensible ; at 2 P.M. he was still convulsed and insensible. Pupils acting, no squint, jaw clenched, but was able to swallow ; at 8.30 P.M. had marked opisthotonos. Temp. 103°·4 ; pulse 126 ; remained insensible during the night. On the 25th, unconscious, pupils insensible, pulse imperceptible. Temp. 102°·4. He died at 12.30 P.M.