THERMOMETRIC OBSERVATIONS ON EPIDEMIC CEREBRO-SPINAL MENINGITIS.

By THOMAS WRIGLEY GRIMSHAW, M.D. Dub.,

Physician to Cork Street Fever Hospital, Dublin; Lecturer on Materia Medica in Dr. Steevens's Hospital; etc.

THE attention of the profession being at present very much directed to the disease now known under the name of epidemic cerebro-spinal meningitis, and as during the past two years I have had extensive opportunities of making thermometric observations on patients labouring under this affection, I believe I am justified in submitting some of the results for the perusal of the readers of the BRITISH MEDICAL JOURNAL, and trust that they will be found of interest. The observations detailed in this paper are selected from a large number; each case being chosen either from its being typical of its class, or as possessing some unusual peculiarity. Considerable difficulty has always been experienced in treating of the disease now under consideration, arising chiefly from the great divergence in character between the different cases. In order, therefore, to make any observations intelligible, it is necessary, in the first place, to classify the cases. There is no disease, as far as I am aware, where the absence of a type is so well marked; therefore, we cannot adopt the usual division into cases according with, and those varying from, a typical form. The classification which appears to me most useful for the present purpose, is founded upon the duration and severity of the cases, as follows.

CLASS 1.—Cases of very mild form, terminating in recovery; the duration being from one to three weeks (usually about a fortnight).

CLASS 2.—Cases of a very severe form setting in suddenly; the symptoms very violent and well marked; terminating in death in from a few hours to three or four days. These cases are usually accompanied by purpuric spots and blotches; and hence the name of Black Death applied to this affection.

CLASS 3.—Cases of medium severity; the symptoms well marked (but not necessarily very severe), usually yielding to treatment, and terminating in recovery in from two to six weeks.

CLASS 4.—Cases which may set in either in a mild or severe form, run a long course (becoming chronic) of from six weeks to six months; the result being generally determined by the previous constitution of the patient.

In accordance with the foregoing classification, I shall give examples of the ranges of temperature as they occurred in a few cases selected from each class.

Of Class 1, the following three cases may be taken as examples. The first two are instances of slight uncomplicated cerebro-spinal meningitis; the third, a case of that disease combined with typhus fever—a combination by no means uncommon during the epidemic.

CASE I.—Mary C., aged 10 years; four days ill before admission. Admitted into Cork Street Hospital on February 12th, 1868, complaining of pain in the head, pain and stiffness of neck, commenced by vomiting, shivering, and pain in head.

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
5.....	28.....	109.....	98.5
6.....	Natural	96.....	98
7.....	Natural	72.....	97.5
8.....	Natural	80.....	97.5

The patient was discharged perfectly well on the nineteenth day.

The treatment in this case consisted of iodide of potassium internally, with leeches and blister to the nape of the neck.

CASE II.—Richard K., aged 22 years; six days ill before admission into Cork Street Hospital on Feb. 13th, 1868. Symptoms the same as last case; commenced in the same way. Treatment almost the same as last. Was convalescent on the twelfth day.

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
8.....	22.....	72.....	99
9.....	24.....	60.....	97
10.....	Natural	72.....	97
11.....	Natural	—.....	98

CASE III.—Patrick R., aged 11 years; three days ill before his admission into Cork Street Fever Hospital on July 12th, 1867. Father in hospital affected with typhus, but without any symptoms of meningitis. All the symptoms of meningeal inflammation well marked, together with many symptoms of typhus; the latter were fully developed in a few days.

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
3.....	40.....	120.....	103.5
4.....	30.....	96.....	103
5.....	30.....	110.....	103

6.....	24.....	108.....	100.5
7.....	30.....	110.....	101
8.....	30.....	120.....	104
9.....	37.....	120.....	102.5
10.....	24.....	84.....	101.3
11.....	30.....	86.....	99
12.....	28.....	98.....	98
13.....	28.....	86.....	97
14.....	18.....	70.....	99
15.....	18.....	84.....	98

The meningitic symptoms quickly improved under the use of iodide of potassium and belladonna internally, with leeches to the temples and behind the ears and blister to the nape of the neck. On the seventh day, the meningitis was much better, and seemed nearly well on the eighth day; but returned again on the ninth; again yielding to similar treatment. The boy was convalescent on the fourteenth day. There was diarrhoea on the fourth and fifth days.

The range of temperature in this case resembles that usually found in typhus (the maximum, 104 deg., being attained on the eighth day). The fall on the sixth day seems to have been the precursor of the diminution of the cerebro-spinal inflammation; the symptoms of which appreciably diminished on the seventh day.

From Class 2, the two following cases are selected.

CASE IV.—Daniel L., a member of the Royal Irish Constabulary, aged 20; a few hours ill before his admission into Dr. Steevens's Hospital on January 31st, 1868,* collapsed; limbs cold and rigid; swallowed with difficulty; a purpuric spot visible over right clavicle; no spots elsewhere. Went to bed well the night before; awoke feeling unwell the following morning; became insensible shortly after, and was brought to hospital, where I saw him about ten o'clock.

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
1.....	24.....	130.....	100
2.....	24.....	120.....	99
3.....	30.....	120.....	99.5
4.....	Gasping	Imperceptible.	

On the day of admission, he was ordered turpentine enema, leeches behind ears, blister to nape of neck, heat to extremities, eight ounces of wine and iodide of potassium internally. The patient soon got out of the state of collapse, but unfortunately his temperature was not observed at this period. On the second day, a large number of purpuric spots, shotty to the feel, were found scattered over various parts of the body; being especially numerous on the legs. On the third day, he was worse; and he died on the fourth day at ten o'clock A.M. The temperature as noted in this case was not very high; but it is probable that it rose during the first day, after the note was taken.

The *post mortem* examination in this case showed a large amount of tarry blood in the cerebral sinuses; the cerebral arachnoid was intensely injected, and opaque in patches in all directions; considerable lymph deposit was observed at the base of the brain. The spinal cord presented similar appearances to the brain; the lymph deposit being most remarkable among the nerves of the cauda equina.†

CASE V.—Ellen K., aged 7 years; about twelve hours ill before her admission into Cork Street Hospital on the afternoon of February 20th, 1868.‡ Illness commenced with vomiting and purging. On the morning of the second day, she was still insensible, except to touch. There appeared to be considerable hyperæsthesia of arms and legs; not much stiffness of limbs; numerous shotty purpuric spots on body and arms, and large purpuric patches on legs. She was ordered leeches behind ears, bromide of potassium, and wine. Was worse on the following morning (third day), although slightly sensible and much warmer. She died at 7 P.M.

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
2.....	24.....	84.....	95
3.....	60.....	160.....	102

The range of temperature through 7 deg. in twenty-four hours is remarkable in this case; as also its accordance with the great increase in number of the respirations and frequency of the pulse.

The next four cases are examples of the third class, and may be considered as average specimens of cerebro-spinal meningitis.

CASE VI.—Mary R., aged 14 years; four days ill before her admission into Cork Street Hospital on July 9th, 1867. Pain in abdomen; vomiting and purging; severe pain in, and much retraction of, head; great stiffness of neck; pain in, and stiffness of, legs.

* This case, as Case II, came under my notice when discharging the duty of Dr. Burke, Physician to Dr. Steevens's Hospital.

† The brain and cord above mentioned were exhibited to the Pathological Society of Dublin on February 8th, 1868.

‡ This case was under the care of my friend and colleague Dr. Mason.

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
5.....	30.....	84.....	102
6.....	24.....	120.....	102
7.....	30.....	120.....	103
8.....	38.....	110.....	103
9.....	38.....	120.....	103
10.....	39.....	105.....	100
11.....	40.....	96.....	101.2
12.....	20.....	90.....	101.2
13.....	Natural	80.....	99.6
14.....	20.....	108.....	101.5
15.....	20.....	96.....	101
16.....	20.....	84.....	100
17.....	20.....	80.....	—
18.....	28.....	108.....	102.5
19.....	24.....	100.....	100
20.....	—.....	90.....	98

The patient improved gradually; the only complication being bronchitis on the ninth day, which was slightly augmented on the fifteenth and eighteenth days. On the two latter occasions, there was increased temperature. The meningitic symptoms were most severe on the eighth day; on which the respiration was very quick, and the pulse very frequent; but the temperature, although high, did not rise above that on the previous or following day. The case is also remarkable for the steady high temperature (103 deg.) maintained for three successive days (seventh, eighth, and ninth). The patient was convalescent on the twenty-second day. The treatment in this case consisted of leeches to the head and blister to the nape of the neck; internally, iodide of potassium and a small quantity (never above two ounces per day) of wine.

CASE VII.—Thomas E., aged 18 years; five days ill before his admission into Cork Street Hospital on February 22nd, 1867. All the symptoms of meningitis well marked, but no spots.

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
6.....	30.....	90.....	101.5
7.....	26.....	64.....	101
8.....	18.....	60.....	101.5
9.....	18.....	84.....	101.5
10.....	36.....	72.....	102.5
11.....	39.....	115.....	102
12.....	40.....	96.....	103
13.....	30.....	84.....	102
14.....	—.....	—.....	—
15.....	48.....	100.....	102.5
16.....	—.....	—.....	—
17.....	40.....	72.....	102
18.....	28.....	84.....	99

This is a good example of a case where slight relapses occurred on the twelfth and fifteenth days; each relapse was accompanied by a rise in temperature. The patient was worse before than after the tenth day, although the temperature rose higher during the latter than the former period. The treatment in this case was similar to the last.*

CASE VIII.—John G., aged 5 years; four days ill before his admission into Cork Street Hospital on July 13th, 1867. All the usual meningitic symptoms (including excessive hyperæsthesia over all parts of trunk and limbs) well marked; a considerable number of small purpuric spots (not shotty to the feel) scattered over the legs; one large purpuric patch, of about the size of a half-crown, on the outer part of the left leg. Effusion of pus into the anterior chamber, and considerable conjunctival inflammation of the right eye.

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
5.....	24.....	130.....	100
6.....	40.....	90.....	104
7.....	24.....	140.....	101
8.....	30.....	120.....	101
9.....	30.....	120.....	101
10.....	36.....	96.....	100
11.....	20.....	108.....	99.5
12.....	20.....	108.....	100
13.....	20.....	96.....	100
14.....	20.....	80.....	100
15.....	20.....	96.....	100
16.....	20.....	108.....	100
17.....	20.....	100.....	100
18.....	20.....	105.....	100.5
19.....	20.....	100.....	98
20.....	20.....	84.....	99

The patient was convalescent on the twenty-third day. Effusion took place into the ankle, knee, and left wrist-joints. There were several relapses of the inflammation of the eye. The boy completely recovered from the disease and all its complications.*

The treatment pursued in this case was iodide of potassium and belladonna internally; leeches to temples and behind the ears, blisters to nape of the neck and along the spine; solution of sulphate of atropia dropped into the affected eye; and tincture of iodine applied over the affected joints. The range of temperature in this case seems to be that of favourable cases generally; namely, a steady rise from the normal to the highest, and steady fall again to the normal temperature, without any other important variations.

CASE IX.—Bridget R., aged 9 years; seven days ill before her admission into Cork Street Hospital on July 11th, 1867. All the symptoms of meningitis well marked, including extreme retraction of the head.

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
8.....	36.....	133.....	100
9.....	34.....	132.....	102.5
10.....	30.....	96.....	100
11.....	34.....	100.....	100.5
12.....	24.....	100.....	100.5
13.....	24.....	84.....	101
14.....	20.....	100.....	99.5
15.....	20.....	98.....	99.2
16.....	30.....	100.....	100
17.....	20.....	96.....	98
18.....	20.....	84.....	98.5

The treatment consisted in quickly bringing the patient under the influence of mercury, by small doses of calomel administered every half-hour (Law's method), until the gums were slightly affected, when iodide of potassium was substituted for the calomel; belladonna was given with the calomel and iodide of potassium; leeches were applied behind the ears; blisters (dressed with mercurial, and afterwards with tartar emetic ointment) to head, nape of neck, and spine.

The range of temperature in this case resembles the last in some ways; but was interrupted in its fall by the slight rises on the thirteenth and sixteenth days; the former accompanied by intense local pain in the head, with temporary increase of the other symptoms; the latter gave rise to anxiety, but was not accompanied or followed by any serious change.

The remaining cases belong to Class 4.

CASE X.—William P., aged 5 years; one day ill before his admission into Cork Street Hospital on July 20th, 1867; was admitted in a state of collapse. When seen on the morning after admission, reaction had set in. There was a long slow inspiration and a short quick expiration; great hyperæsthesia; head retracted to an extreme degree; anterior chamber of right eye half filled with pus; there seemed also to be purulent effusion into the posterior chamber; apparently deaf, but takes notice of all surrounding objects, and calls for drinks, etc., when required. He was ordered iodide of potassium, with tincture of belladonna, and four ounces of wine; blister to head and cervical spine; leeches to temples; atropine to be dropped into affected eye.

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
8.....	24.....	130.....	98
9.....	20.....	?	100.25
10.....	Irregular	?	97.5
11.....	22.....	120.....	100.25
12.....	22.....	120.....	100
13.....	22.....	110.....	97
14.....	22.....	130.....	98.5
15.....	22.....	120.....	99
16.....	22.....	120.....	100
17.....	22.....	120.....	98
18.....	22.....	90.....	103
19.....	22.....	100.....	102
20.....	Not noted	90.....	100
21.....	—.....	140.....	101
22.....	—.....	120.....	100.5
23.....	—.....	140.....	101
24.....	—.....	100.....	98
25.....	Irregular	120.....	99
26.....	22.....	120.....	98
27.....	22.....	120.....	99
28.....	26.....	130.....	100.5

* I saw this patient several months after his discharge from the hospital. His mother told me that, shortly after his return home, he got a fresh attack of inflammation in the eye, which (not having received any attention) completely destroyed the sight.

* This case was under the care of my friend and colleague Dr. Kennedy.

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
29.....	30.....	144.....	102
30.....	28.....	130.....	103
31.....	30.....	130.....	103
32.....	24.....	120.....	101.5
33.....	24.....	120.....	99
34.....	Not noted	100.....	98
35.....	—	100.....	98
36.....	—	108.....	99
37.....	—	110.....	99
38.....	Irregular	96.....	97.5
39.....	”	84.....	96.2
40.....	31.....	100.....	102
41.....	26.....	86.....	99

The temperature soon fell to the normal, and there was no further variation of consequence. The patient remained in a very doubtful state for two months, and was discharged in October quite well, except his eye, which was almost useless. The foregoing range of temperature shows well the frequent variations which occur in cases of this class. Each of the great rises in temperature corresponded with an aggravation of all the symptoms of meningitis. On each occasion on which the temperature fell very low, as on the tenth and thirty-ninth days, the patient fell into a state of almost hopeless collapse. It is worthy of remark that, on the eighteenth day, a temperature of 103 deg. corresponded with a pulse of 90; while, on the thirtieth day, a similar temperature corresponded with a pulse of 130. A similar want of relation may be observed on the thirteenth day, when a temperature of 97 deg. accompanied a pulse of 110. All these discrepancies between pulse and temperature were accompanied by other urgent symptoms.*

CASE XI.—Patrick E., aged 20, a member of the Royal Irish Constabulary; three days ill before his admission into Dr. Stevens's Hospital on January 13th, 1868. All the symptoms of meningitis well marked; and numerous shotty purpuric spots.

A portion of the range of temperature in this case is given, on account of its reaching the remarkably high point of 110 deg. Otherwise, the variations much resembled those of Case X. The treatment pursued was also similar in the last case.

DAY.	TEMP.	DAY.	TEMP.
15.....	99.5	21, at 10 o'clock	110
16.....	100	21, at 1 o'clock	105.5
17.....	103.5	22.....	100
18.....	102.5	23.....	100
19.....	99	24.....	99
20.....	100	25.....	100

There were frequent variations after the twenty-fourth day; but the temperature never again rose above 101 deg. On the eleventh day, he thought himself convalescent; on the fifteenth day, the pain in his head returned, but was gone on the following day, to return again on the seventeenth, to improve again on the eighteenth day. This improvement continued until the twenty-first day, when he was seized with sudden pain in the head (the most severe he had yet experienced), causing him to cry out; his temperature rose to 110 deg. at ten o'clock A.M.; he vomited shortly after; and at one o'clock the temperature was 105.5. The patient from this time got worse; sometimes a temporary improvement took place; he became gradually exhausted; and died on the seventy-sixth day.

On *post mortem* examination, considerable subarachnoid effusion and slight opacity of the arachnoid at the base of the brain were observed. There was no increase of vascularity, nor minute structural change in the nerve-tissue, which was carefully examined by my friend, Dr. Robert M'Donnell.

So high a temperature (110 deg.) as that attained in this case on the twenty-first day, has, I believe, been only once recorded (Wunderlich), as occurring in a case of meningitis.†

CASE XII.—Kate D., aged 6 years; four days ill before her admission into Cork Street Hospital on July 12th, 1867.‡

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
5.....	24.....	130.....	104
6.....	26.....	140.....	104.25
7.....	36.....	144.....	101
8.....	24.....	140.....	102.5

DAY.	RESPIRATION.	PULSE.	TEMP. IN DEG. FAHR.
9.....	25.....	90.....	101
10.....	?	90.....	102
11.....	30.....	120.....	103
12.....	?	?	100
13.....	?	100.....	100
14.....	?	130.....	101
15.....	20.....	130.....	101.5
16.....	20.....	?	100
17.....	20.....	140.....	99
18.....	20.....	110.....	100
19.....	20.....	105.....	101
20.....	20.....	90.....	98
21.....	20.....	75.....	100
22.....	20.....	75.....	99
23.....	20.....	70.....	99.5
24.....	20.....	130.....	99.5
25.....	20.....	132.....	100
26.....	20.....	100.....	98.5
27.....	20.....	100.....	98.5
28.....	20.....	84.....	99
29.....	?	108.....	98
30.....	20.....	?	98
31.....	?	?	98.5
32.....	?	?	97.5
33.....	?	?	98

This case was treated internally by calomel, until the gums were slightly affected; then iodide of potassium and belladonna, with blister along spine, and leeches to head and behind ears. Herpes appeared on the face and right arm on the sixteenth day. This was followed by pemphigus. A small abscess formed on the right parietal protuberance on the twenty-fourth day. None of these complications were accompanied by an increase of temperature. There are many discrepancies between the pulse and temperature, as observed in other cases. However, the highest temperature (104.25 deg.) and most frequent pulse (144) occurred on the same (sixth) day.

From the foregoing cases and observations, we may, I think, arrive at the following conclusions, with regard to the thermometry of this disease. 1. That it has no typical range of temperature. 2. That the temperature seldom exceeds 100 deg. in mild cases (Class I—Case III being complex); 103 deg. in rapidly fatal (Class II), or moderately severe cases (Class III); or 104 deg. in any. 3. That the degree of temperature and frequency of pulse have not that accord usually found in acute disease; although the accordance is usually much closer in favourable (Cases I, II, III, VI, IX) than unfavourable cases (IV, VII, VIII, X, and XII). 4. That variations in temperature seldom precede, but usually (when at all related to) accompany variations in other symptoms. 5. That low temperatures (95 or 96 degs.) usually indicate a severe case, or bad result. 6. That high temperatures (over 104 deg.) indicate a severe case (VIII and X). 7. That great and frequent variations of temperature indicate a serious and prolonged case, with a very doubtful result (Cases X and XII).

[The above article was written in June last. Since that date, a valuable and elaborate report on "Epidemic Cerebro-Spinal Meningitis, or Cerebro-Spinal Fever", by Edward W. Collins, M.B. Dub., has appeared in the *Dublin Quarterly Journal of Medical Science* for August of this year. Mr. Collins's observations accord in the main with those above recorded, as they do also with those of several other observers of known repute. I believe that the report of Mr. Collins contains the most able digest which has yet appeared of the literature of cerebro-spinal meningitis.]

CASE OF TRIPLETS, OF WHICH TWO WERE BLIGHTED.

By W. V. LYLE, Esq.

ON the morning of July 27th, 1868, I was called to Mrs. D., and found her in labour. Digital examination showed the os dilated to the extent of a crown, and the head normally presenting. The membranes were unbroken. To the left and posterior side of the os, an undefined and moveable body intervened between the membranes and the presenting head. After a short time, I ruptured the membranes, and almost immediately was expelled a blighted foetus of about four months' growth. The foetus was attached by an attenuated cord. The labour progressed favourably, and a living female child of about eight months was born. A few minutes after the placenta was expelled, and in connexion with it, was a separate sac, containing another blighted foetus, apparently of the same age—not, however, connected by any cord. The mother made a good recovery. The infant is also doing well.

* This patient was under the care of Dr. Kennedy during the latter part of his residence in the hospital.

† The brain and spinal cord of this patient were exhibited at the Pathological Society of Dublin on March 28th, 1868.

‡ This case has been referred to already in the *JOURNAL* of September 28th, 1867, as also Cases VIII and X. Case XII has also been mentioned (with special reference to the eruptions that occurred during its course) in the *Journal of Cutaneous Medicine* for 1868, page 39.