Thesis

For degree of M.D.

Presented by

William Walls Christie M.B., C.M.

18th March 1889.

The Outbreak of Febrile Disease in St. Mary's Roman Catholic Industrial Schools, Glasgow, March 1888.

Its Clinical Features and Nature.

11

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II

The History and Circumstances of this Outbreak of Disease have been fully discussed[a] by Dr. J. B. Russell, but Dr Russell left it for me[b] to describe in detail the Clinical Features of the Outbreak. This it is now my intention to do.

The Outbreak occurred in the above mentioned Schools in March 1888, the first case occurring on March 2nd

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(a) "The History and Circumstances of a Peculiar Outbreak of Febrile Disease in St. Mary's Roman Catholic Industrial School for Boys, Glasgow, March, 1888." By James B. Russell M.D., L.L.D. Medical Officer of Health for Glasgow. Glasgow 1888.

(b) Idem p. 6

and the last on March 29th. At the time of the Outbreak there were 207 (two hundred and seven) boys, and 194 (one hundred and ninety-four) girls in the Institution, and of these, 66 (sixty-six) boys and 2 (two) girls were attacked.

31 (Thirty-one) of the most severe cases, excepting the fatal cases, were removed to The City of Glasgow Fever Hospital, Belvidere, where through the kindness of Dr Allan Physician-Superintendent, they were placed under my care, but for details of the cases which were treated at the School, as well as for notes of those sent to Belvidere, previous to removal, I am indebted to Dr Russell.

As regards the plan of this paper, I shall first describe a number of the cases which illustrate the main points which were observed throughout. I shall next describe the individual symptoms, and lastly, I shall consider the nature of the disease.

4 (Four) of the cases proved fatal and a post-mortem examination of two of these was made. None of the fatal cases had been removed from the Institution, and all four occurred about the beginning of the Outbreak.

The facts which could be gathered regarding them are these:

Case I P. V. act. 15 complained of sickness and headache on March 2nd and was sent to bed in his dormitory. On March 3rd he got up with the other boys and made his bed, but being observed to be very unsteady on his legs was sent to the sickroom where he sat on a chair at the fire and snored heavily. He died at 8 a.m.

Case II J. K. act. 14 complained of headache and sickness on March 3rd and was sent to bed.
On March 4th the headache continued.
On March 5th at one a.m. he became very violent, jumping out of bed and tearing his shirt without uttering a word. Had to be held in bed. His

head was thrown back with great force. Chloroform was administered to allay the violent movements of the body and an enema of bromide of potassium was administered. At three a.m. the convulsive movements ceased and he seemed to fall into a natural sleep. Pulse about 80 (eighty) and weak. He continued in this state until about 3.30 a.m. when his breathing became more laboured and he died about four a.m. The pupils were greatly dilated during the attack.

Case III At five p.m. on March 7th D. McG. aet. 11 reported himself ill with headache, having vomited shortly before, and was sent to bed in his dormitory. The superintendent's wife found him asleep about six p.m. and did not awake him. A boy sent with tea could not rouse him and he died comatose at eight p.m.

A post-mortem examination was made on March 8th by D Joseph Coats, Pathologist to the Western

Infirmary, and he reported as follows:

"Dennis M'Guire, aged 11 (eleven) years; died 7th March, at 8 (eight) p.m., after 3 (three) hours of acknowledged illness.

"Rigor mortis well developed.

"Arms, lateral aspects of chest and neck present a livid colour, very deep on left ear; very little lividity of lower limbs.

"Brain shows a certain dryness of the surface, but there is no hyperæmia of membranes and no exudation. The ventricles are not distended and the brain substance is of normal consistence.

"Heart. The blood in heart and body generally is perfectly fluid. The heart itself is normal.

"Right Lung firmly adherent, and there are some old condensations at apex; at root of lung some enlarged and slightly caseous glands.

"Left Lung non-adherent and otherwise normal. There is no condensation in either lung.

"Right Kidney extremely hyperæmic.

"Left Kidney, similar.

"The Bladder is greatly distended with urine, fundus reaching above umbilicus.
"The Liver presents nothing remarkable.
"The Spleen is considerably enlarged and hyperæmic. The Malpighian bodies are remarkably prominent.
"In the lower part of small intestine there is a distinct, but not very considerable enlargement of solitary follicles and Peyer's Patches. There is no special hyperæmia of them.
"Mesenteric glands are distinctly enlarged and slightly red. No degeneration or sign of tubercular lesion.

Case IV. On March 8th when the boys in the middle dormitory were being wakened about 5.45 a.m. B. M'K. act. 14 was found to be unconscious, and died about 6.15 a.m. He had been well on going to bed at night.

A post-mortem examination of this body was also made on March 8th by Dr Coats who reported

as follows:

"Bernard M'Kenna, aged 14 years, died at 6·15 a.m. on the 8th, having gone to bed apparently well and been found dying when the boys were being awaked half an hour previously.

"Rigor mortis well developed.

"Bluish colour over entire posterior aspect of body and on right lateral aspect of trunk and lower limb. There is also a blue mottling over the lateral aspects of trunk and neck.

"Brain. Membranes present a moderate degree of injection, but there is no exudation, and the brain in general is normal in appearance.

"Heart. The blood in heart is partly coagulated; heart normal.

"Both Lungs are somewhat adherent, but otherwise normal in appearance.

"Spleen is somewhat enlarged, but not markedly hyperæmic. The Malpighian bodies are unduly prominent, but not so markedly as in other case.

"The Kidneys are moderately hyperæmic, right more so than left, but neither

so much as in other case.

"Mesenteric glands are much enlarged but not generally red. They present no degeneration or sign of tubercular lesion.

"In the small intestine there is a general enlargement of the solitary follicles and Peyer's Patches, but it is not so great as in the other case.

"Microscopic Examination.

"Portions of the spleen, mesenteric glands, intestine, and brain were removed from both cases and prepared for microscopic examination. Nothing special was revealed by this examination, and, in particular, no micro-organisms were discovered."

"Mr. Maylard made culture-experiments with the blood of 7 (seven) of the Bethnal Green patients, but with negative results. Micrococci were found in 4 (four) cases, but different in all and probably of external origin. In the remaining 3 (three) cases nothing was found."

D. D. aet. 12

March	8	9	10	11	12	13	14	15	16	17	18	19	20
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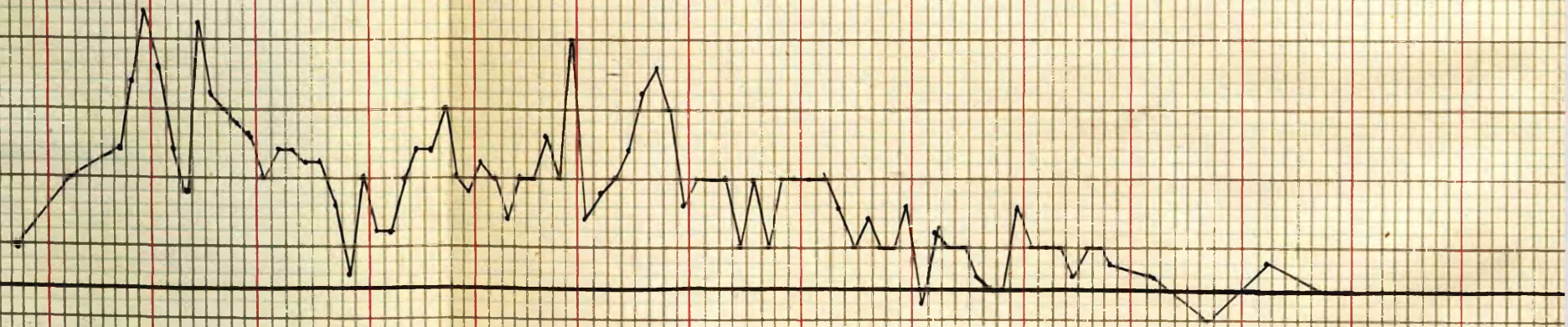


I shall now give notes of some of the cases which were sent to Belvidere.

Case V Sudden onset: pulmonary consolidation: herpes: diminution in amount of chlorides in urine: followed by pain and swelling of joints, and a purpuric eruption.

D. D. act. 12 stated that he became ill on 2nd March with headache, sickness, vomiting and pain in back and legs.

Admitted to Belvidere Hospital on 8th March (7th day of illness), up till which time no notes were taken of his case.

On admission. Cough severe: consolidation of left lung posteriorly: respiratory murmur on right side unsatisfactory.

10th March. P/R 80/44 Pulse soft, small and compressible; eyes suffused; tongue coated with thin white fur, except anterior third which is clean; consolidation as noted on admission (shown by dulness and tubular breathing); respiratory murmur on right side still unsatisfactory;

on sitting up to be examined he coughed almost incessantly, and the breathing had a "hicking" character.

13th March. P/R 80/32 Pulse moderately full and strong, respiration quiet; cough slight; duskiness of lips and ears; crusts on left side of chin; breath offensive; V. S. (aortic) murmur heard; percussion note dull at left lower back; breathing tubular at angle of left scapula, less so at angle of right; abdomen normal, spleen normal.

16th March. P/R 80/28 Appearance still somewhat dusky; breathing tubular over upper two-thirds of left back, but no decided dulness made out.

18th March. P/R 80/24 Breath now not offensive; crusts still present on chin; cough tripling; perhaps slight prolongation of expiration at angle of right scapula, otherwise chest is normal.

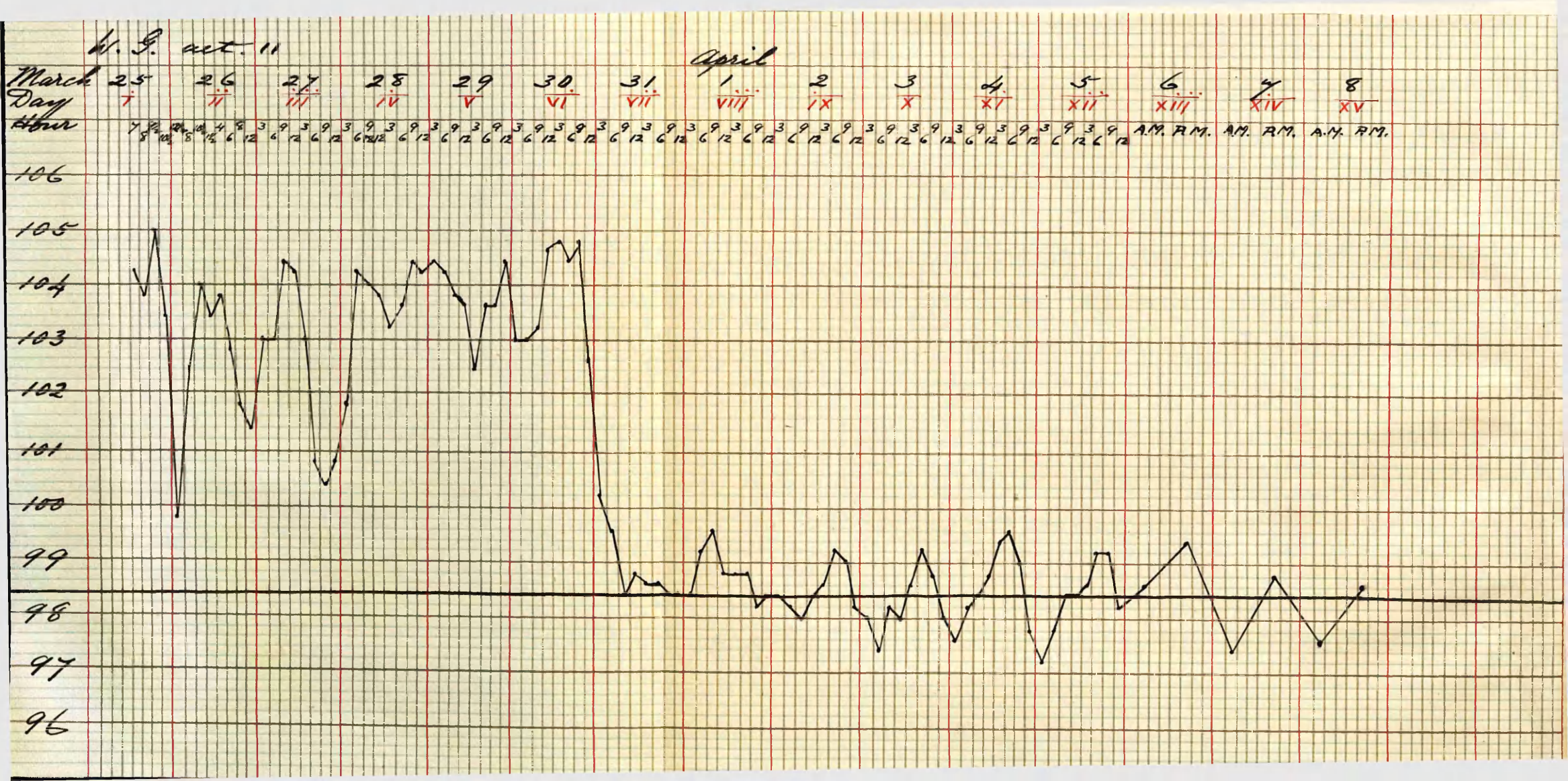
20th March. Cough gone; chest perfectly normal.

21st March. Allowed up.

23rd March. T. 100 Pain in calves of legs; legs edematous from knees downwards and covered with a mottled petechial eruption, a few petechiae also on thighs; swelling of wrists with slight pain.
24th March. Arms and legs still swollen and edematous; pain only in calves of legs.
25th March. Eruption becoming brownish.
26th March. Pain gone, no swelling.
29th March. No return of pain nor of swelling; all that remains of eruption is a faint brown staining.
30th March. Allowed up. Two hours after getting up a number of fresh petechiae were found on legs, and one or two on thighs. Put back to bed.
1st April. Spots not so bright, but there is slight edema.
2nd April. Spots fading; no pain; slight prolongation of first cardiac sound, heard most distinctly over aortic cartilage.
5th April. Spots gone; a "tranny" condition of the skin remains; no pain; slight prolongation of first cardiac sound, heard both over aortic and mitral areas,

otherwise chest is perfectly normal.
10th April. P/R 4/6 / 2/4 Slight staining over lower part of legs, and "bramy" condition of skin still persists; slight prolongation of first cardiac sound still heard; there is very slight dulness of percussion note down right front and respiratory murmur is somewhat weak, there is also dulness down right back and respiratory murmur is somewhat weak down both backs, but no râle is heard.(a)

(a) Respiratory murmur probably normal all over chest, a naturally harsh murmur under left clavicle giving rise to the idea that over other parts of chest the respiratory murmur was "somewhat weak."
The dulness on the right side may be accounted for by the fact that a slightly dull, or dull-tympanitic note often persists for a considerable time after there has been consolidation of a lung, and this note is readily mistaken for the normal percussion note, the normal percussion note being then taken to be the altered note.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11th April. Allowed up.
20th April. Chest perfectly normal.
Bowels tended to be constipated throughout the attack.
Urine was abundant in quantity. On several occasions it contained a trace of albumen, but never more.
Chlorides were more or less diminished in quantity for fourteen days after admission. For first two days there was a decided diminution.
21st April. Dismissed "well."

Case VI (a) Sudden onset – shivering and pain in side: pulmonary consolidation: delirium: herpes: enlargement of spleen: crisis on 6th (sixth) day.
W. G. aet. 11
25th March. Was apparently well and

(a) The cases of the two girls resemble this one. In one there was double pneumonia with pleuritic effusion, and in the other unilateral pneumonia with a suspicion of effusion.

took tea, at 5.30 p.m. About an hour later while playing in the hall he became ill with slight shivering, headache, sickness, and pain at the sternum and afterwards on the left side. At 7 p.m. his temp. was 104.2°, at 9.30 p.m. 105°

26th March. 12.30 a.m. 99.8°

6 100.6°

10 104.6°

12.30 p.m. 104°

Between 10.30 p.m. and 10 a.m. there was frequent vomiting of dark green matter. Before admission to Belvidere Hospital there was also noted cough, slight delirium, flushed face and hurried breathing.

On admission to hospital P/R 128/48 Pulse small and firm: breathing heavy and accompanied by dilatation of nostrils: sickness, headache, pain in abdomen increased on forced inspiration and on pressure: restless: anxious look: duskiness of face and nails: breath very offensive: tongue furred, dry down centre

percussion note clear all over chest, occasional mucous râle heard over right front and some snoring at left upper front: splenic and hepatic dullness normal: no rash: feet rather cold.

27th March. P/R 128/48 Pulse moderately full, compressible: breathing shallow, retching and vomiting during night and this morning: anxious look: eyes sunken: dusky appearance: profuse herpetic eruption at right angle of mouth, on right side of upper lip and to a less extent at left angle of mouth: tongue thickly furred, moist: dullness on percussion at upper part of right lung in front and behind with crepitus and increased vocal fremitus and resonance.

29th March. P/R 132/60 Pain in right side (hypochondrium): vomited four or five times since last note: general appearance same as previously noted: constant short cough: spit scanty, rusty: dull percussion note all down

right back with intensely tubular breathing, increased vocal fremitus and resonance and crepitus: under right clavicle percussion note is hyper-resonant and breathing is bronchial towards base in right axillary line there is friction: at left base expiration is somewhat prolonged and there is crepitus: splenic dulness considerably increased: abdomen slightly tender on pressure.
31st March. P/R 94/34 Pulse small, soft, and compressible: breathing quiet: appears exhausted rather than distressed: is no longer restless: tongue cleaning: cough troublesome: spits a large quantity of viscid mucus: percussion note down right front is somewhat tympanitic, and here expiration is prolonged and there is snoring on forced inspiration; percussion note dull all down right back, with tubular breathing and bubbling rales, and at base crepitus: at left base crepitant and mucous rales, but no dulness.
1st April. P/R 76/34 Slight pain still present in epigastrium and right

hypochondrium increased on coughing: perspires freely about head: crusts still present about mouth: a few mucous rales at right base in front, and dulness at right base behind with crepitus and increased vocal fremitus and resonance percussion note dull under left clavicle,(a) and some mucous rales at left base.

3rd April. P/R 76/32 Pain gone: colour good: still perspires freely about head especially after coughing: tongue clean: breath offensive: pupils unequal — right larger than left: cough severe: quantity of spit decreasing: chest practically the same as last noted: splenic dulness still increased.

5th April. P/R 80/26 Still appears somewhat exhausted but feels well: inequality of pupils noted as on 3rd inst. cough trifling, no spit: slight comparative flatness of percussion note at left apex in front, but breathsounds are

(a) Probably a naturally flatter note here, as is often observed.

full and distinct here; a degree of weakness of respiratory murmur all down right front, and slight dulness all down right back with some harshness of respiratory murmur and about the base prolonged expiration and crepitus, vocal fremitus increased, vocal resonance same as at left base.

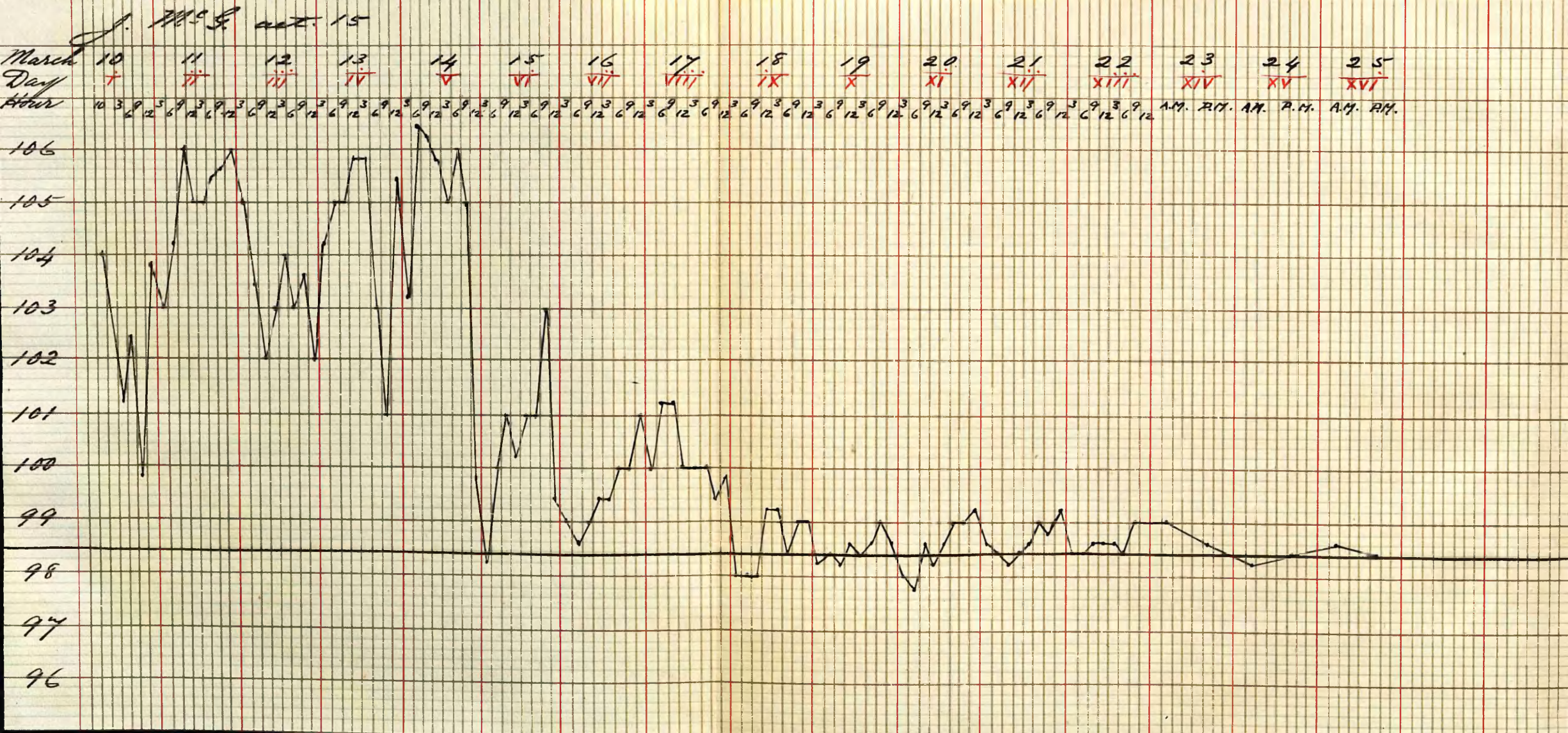
8th April. P/R 72/28 Feels and appears well: a few crusts still on face: right pupil perhaps a little fuller than left: a degree of dulness all over right side of chest, but breathsounds are distinct and no rales heard: area of splenic dulness still considerably increased.

9th April. Allowed up.

16th April. Chest perfectly normal: spleen still considerably enlarged.

Bowels were constipated during the febrile stage, but after that became regular.

Urine. During the febrile stage the quantity of urine passed was small, it was of high specific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gravity and frequently contained a trace of albumen, but after that stage it was normal.
The chlorides were tested for but no diminution of them was detected.
18th April. Chest perfectly normal. Dismissed "well."

Case VII Sudden onset: pulmonary consolidation: high temperatures with rapid defervescence.
J. Mc. G. aet. 15
On March 10th at 9 a.m. he first complained of headache, and pain in the left side. Temp. 104
He was sick and vomited and his breathing was hurried. At noon, temp. 102 Was sent to Belvidere Hospital the same day.
On admission P/R 108/30 Pulse moderately full, soft: tongue thickly furred: breath offensive: face flushed: lips dusky: one or two vesicles at right angle of mouth: eyes heavy: chest and abdomen examined but nothing noteworthy detected: great enlargement

of glands of neck, of old standing.
12th March. P/R 112/32 Breathing somewhat laboured: pain in left side (hypochondrium): herpetic eruption at both angles of mouth, on upper lip, on tip of nose, and on edge of nostrils: ears, lips and extremities tend to be dusky: cough severe: spits a quantity of frothy mucus: is very thirsty slept little: a few mucous râles heard down left front on forced inspiration, otherwise nothing abnormal detected in chest.
13th March. Prof. Gemmell notes- "Chest clear, spleen normal, abdomen normal."
14th March. P/R 104/20 Pulse full and bounding: breathing heavy: pain in left side of chest: drowsy: expression dull: dusky appearance: pupils full: tongue dry down centre perspires freely: cough severe: spit small in quantity, muco-purulent, slightly frothy, contains no blood: percussion note flat under left clavicle and near left apex behind

and crepitus is heard over the dull area
15th March. P/R 88/24 Pain under left
nipple increased on coughing and
forced inspiration: appears prostrat-
ed: colour better: cough severe: spits
a small quantity of frothy
mucus without any appearance
of blood: dulness under left
clavicle with deficient respiratory
murmur: dulness at upper left
back with perhaps slight prolonga-
tion of expiration.
16th March. Prof. Gemmell notes
"Still certain flatness of percus-
sion, but less than two days ago.
Respiratory murmur deficient,
without tubularity, and rales have
disappeared. Left apex behind—
respiratory murmur only deficient,
but without any serious alteration
in percussion, and without tubularity
or rale. Elsewhere pulmonary conditions
are natural."
19th March. P/R 64/22 Pulse small and
weak: breathing quiet: feels well:
pupils normal: still some crusts

about mouth and nose: tongue thickly furred behind: breath very offensive: no cough: respiratory murmur somewhat deficient at left base behind otherwise chest is normal: area of splenic dulness is apparently increased but otherwise abdomen is normal.

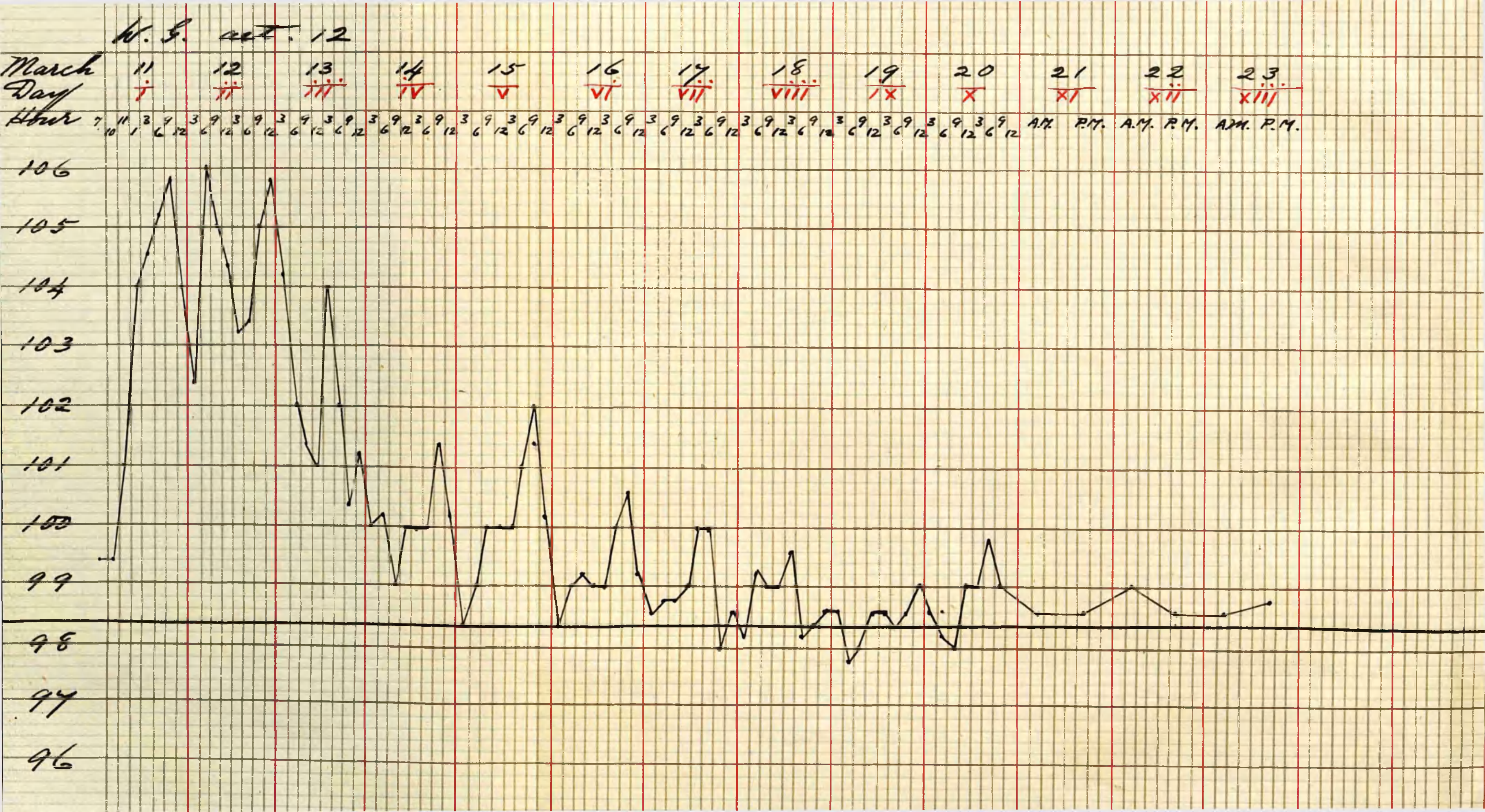
23rd March. Allowed up.

3rd April. P/R 72/20 Feels well: glandular enlargements on neck are much the same as on admission: percussion note flat and crepitus heard at left apex in front: occasional snoring down left back.

10th April. P/R 88/20

11th April. Slight degree of dulness and slight weakness of respiratory murmur over the right front: slight degree of dulness over the right back with somewhat tubular breathing at apex.

13th April. Slight flatness of percussion note at right apex in front, and all down right back, but breathsounds are full and distinct all over.


W. G. aet. 12
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15th April, and 17th April. Chest perfectly normal.

Bowels constipated during febrile stage, after that regular.

Urine abundant in quantity throughout: frequently contained a trace of albumen but never more: chlorides decidedly diminished until 5th (fifth) day of illness – more or less diminished until 8th (eighth) day.

18th April. Dismissed "well."

Case VIII Sudden onset: no distinct physical signs of pulmonary consolidation: herpes: deficiency of chlorides in urine: defervescence not so rapid as in the last case and followed by perturbations.

W. S. act. 12

On 11th March at 3 a.m. he complained of sickness and pain in right side. Temp. about 7 a.m. 99·4 10 a.m. 99·4 11 a.m. 101 lips livid, has a startled look, rattle in throat and short suppressed cough, tongue quite moist

slight yellow fur at root: slight left dulness. Before admission to hospital it was noted in addition that he was flushed and restless, and that his breathing was hurried. Sent to Belvidere Hospital the same day.

On admission, complains of pain in right side (hypochondrium) and cough. P/R 120/48 Pulse weak; nostrils dilate with each inspiration: lips livid, covered with sordes: eyes injected, pupils normal: hand unsteady: appears greatly prostrated: tongue furred down centre: breath offensive: a few mucous rales and deficient respiratory murmur on right side but no dulness made out.

12th March. P/R 108/40 Pulse weak: breathing heavy: very restless during night: cough troublesome: appears better than he was yesterday: snoring heard over right back.

13th March. Prof. Gemmell notes— "Snoring heard."

15th March. P/R 80/32 Pain in right side,

not increased on coughing: lips dusky: herpetic eruption round nostrils and on lips: perspiring freely about head: tongue moist and thinly furred: cough troublesome, seldom spits: mucous râles at upper left front and down both backs.

16th March. Prof. Gemmell notes— "Percussion perfectly clear all over back. Only at extreme right base there is a moderate degree of snoring. All over front condition is absolutely normal."

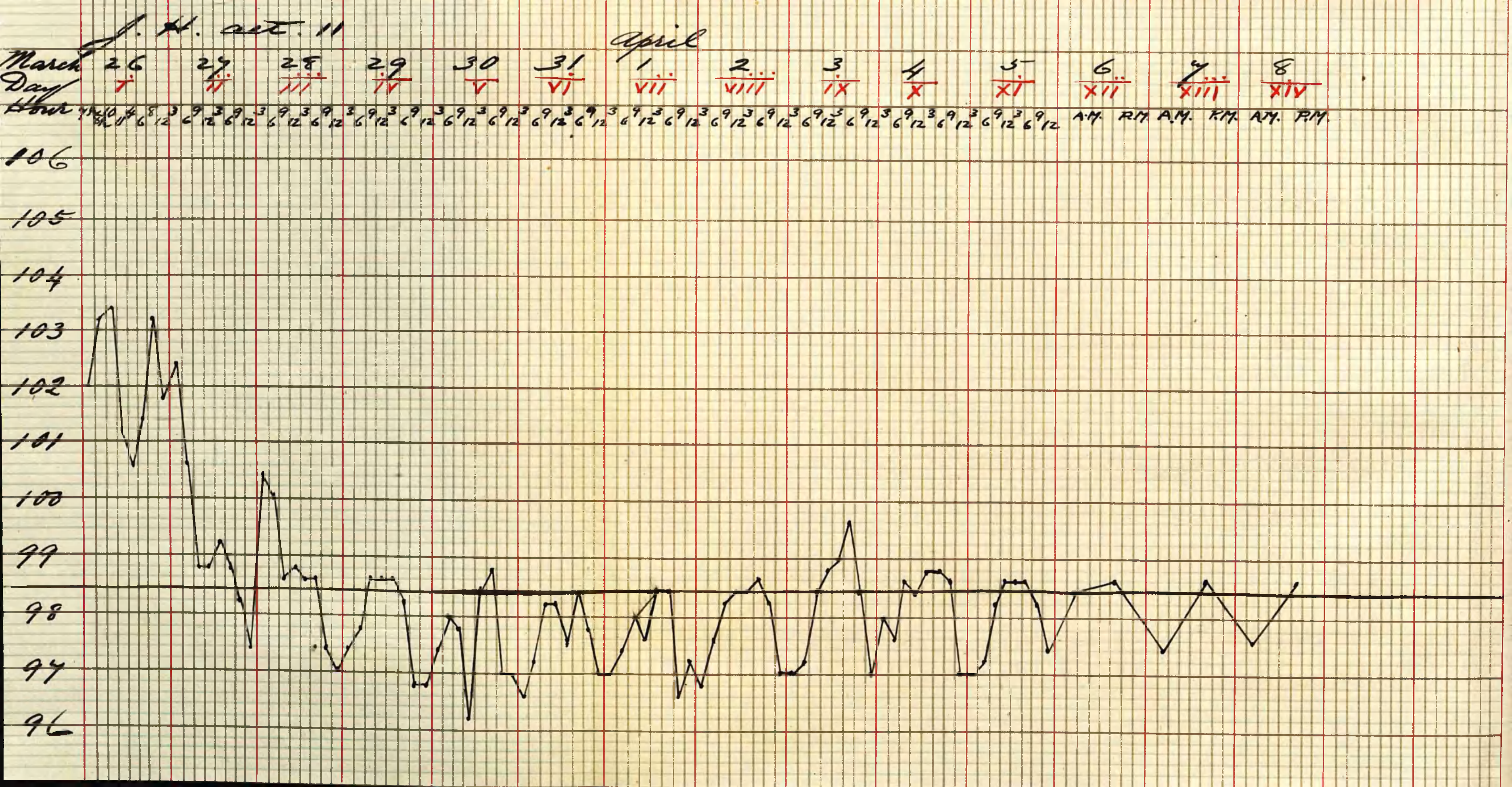
19th March. P/R 80/24 Feels well: appears pale: one or two crusts on chin and round edge of nostrils: tongue moist, thin yellow fur down centre: breath offensive: no cough: chest and abdomen normal.

22nd March. P/R 76/24 Chest seems normal although here and there respiratory murmur is weak.

23rd March. Allowed up.

3rd April. P/R 72/16 Chest perfectly normal.

Bowels constipated during febrile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stage, after that regular.

Urine passed in fair amount throughout but more abundant after febrile stage: frequently contained a trace of albumen, (but never more,) especially during the febrile stage: chlorides diminished more or less for the first three days.
4th April. Dismissed "Well."

Case IX Sudden onset: catarrhal signs in one lung: herpes?: duration of pyrexia, two days.

J. H. act. 11

On 26th March complained of sickness and headache, and vomited - the vomited matter being dark green in colour.

At 7.30 a.m.	temp. 102
8.30	103.2
10	103.4
11	101.2
12.30 p.m.	101

Between 8 a.m. and 10 a.m. vesicles appeared over the whole face - chin, forehead and lips. Sent to Belvidere

Hospital the same afternoon.
On admission P/R 118/20 Pulse small and soft; breathing quiet: headache, face slightly dusky: a few small crusts at edge of nostrils: tongue moist and furred: breath offensive: taches bleuâtres on chest and abdomen and one or two also on back, but no other eruption: percussion note clear all over chest and respiratory murmur full and distinct; slight snoring at right base: spleen apparently normal and abdomen otherwise normal
29th March. P/R 72/18 Cough slight: taches bleuâtres still present on chest, abdomen, back and legs: breath sounds rather harsh down right front: slight crepitus, with occasional wheezing on forced inspiration at right base behind.
1st April. P/R 76/16 No cough, no spit; chest and abdomen normal.
4th April. P/R 76/22 Still slight duskiness of face: flatness of percussion note at left apex in front,(a) but no

(a) Probably the natural condition.

alteration of the breathsounds and no râle; chest otherwise normal: abdomen normal.

8th April. P/R 80/18 Colour good: no cough: a few taches are still present, but are becoming less distinct: a degree of flatness of percussion note all down right front with weakened respiratory murmur: slight comparative dulness over upper half of right lung, but breathsounds are distinct over both backs and there are no râles.

9th April. Allowed up.

13th April. Chest perfectly normal.

Bowels at first constipated but soon became regular.

Urine always passed in sufficient quantity, though not so abundant during the febrile stage as subsequently: on one or two occasions contained a trace of albumen but never more: diminution in quantity of chlorides noted on one or two occasions, but never very marked.

H. D. act. 13

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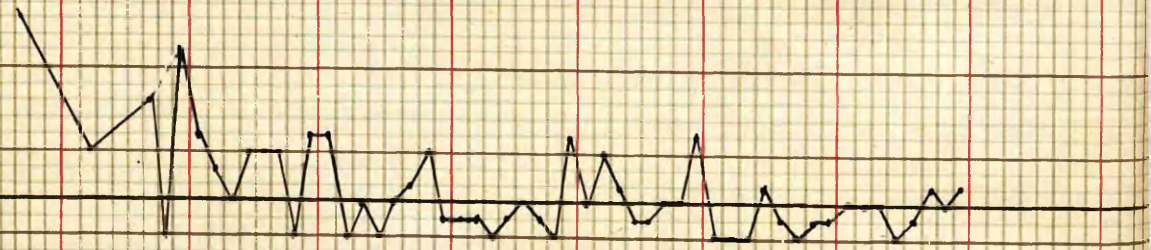


18th April. Chest perfectly normal. Dismissed "well."

Case X Sudden onset: doubtful physical signs in chest: deficiency of chlorides in urine: temperature normal after the second day.

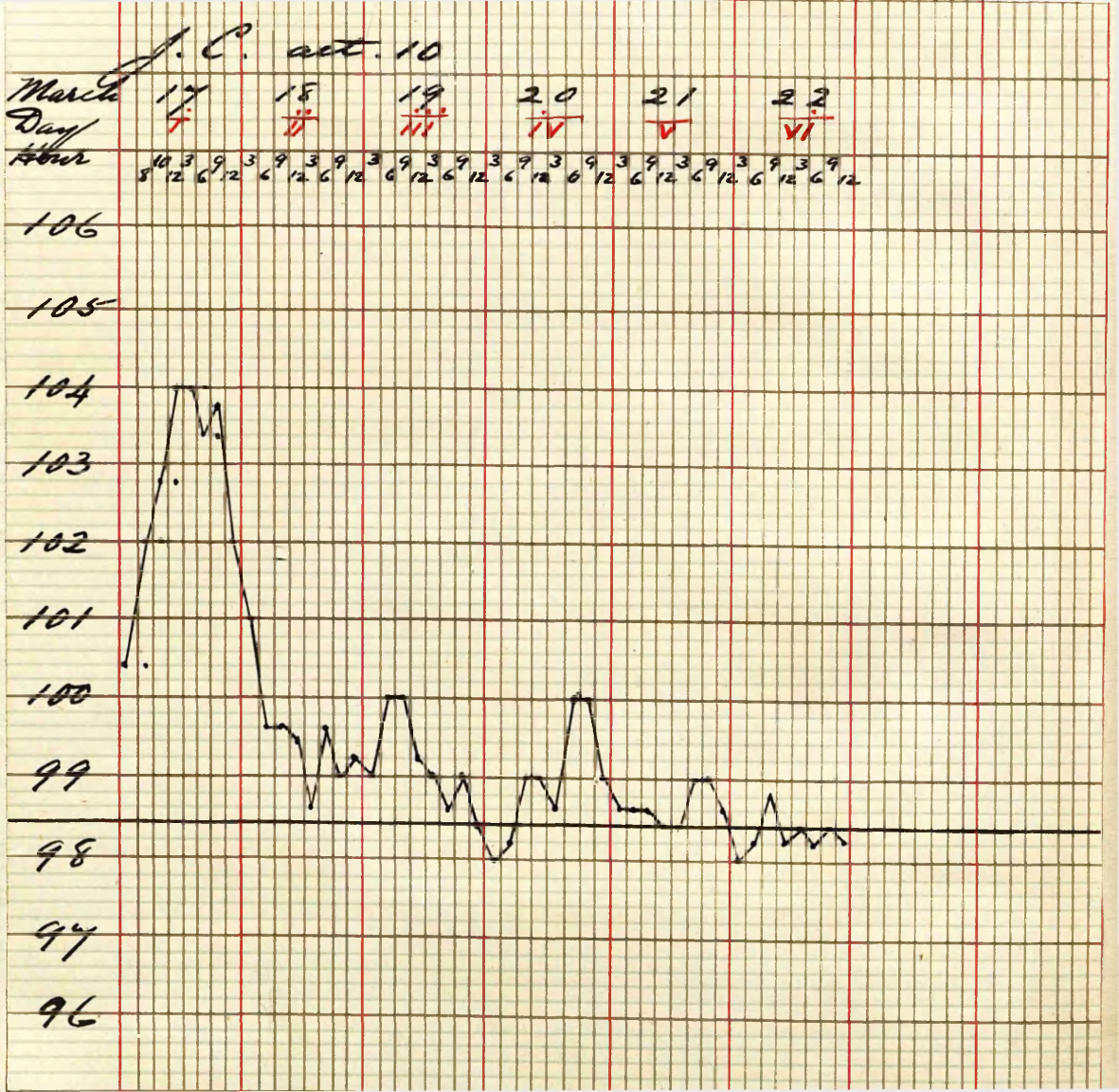
H. D. act. 13

Patient stated that he became ill on 8th March with headache, sickness, vomiting and pain in the abdomen. He was sent to Belvidere Hospital the same day.

On admission Pulse 80 full and strong: face flushed, eyes suffused: tongue clean and moist; no rash: coughing: deficient respiratory murmur all over right side in front and behind and dullness at right base behind.

11th March P/R 60/44 No cough: pupils dilated: slight dullness at right base behind, but nothing abnormal detected by auscultation.

15th March. P/R 64/18 Appears quite well: breath offensive: chest clear.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17th March. P/R 64/24 Breath not offensive: otherwise no alteration since last note.
18th March. Allowed up.
24th March. Appears well: chest normal.

Bowels at first constipated afterwards became regular.

Urine abundant in quantity: on one or two occasions contained a trace of albumen, but never more. A diminution in the amount of chlorides was noted.
29th March. Dismissed "well."

Case XI Sudden onset.[a] No cough. nothing abnormal detected in lungs. stupor: diminution of chlorides in urine: short course.

J. C. act. 10
On 17th March became ill with headache, sickness, pain in the side

[a] This is the only case sent to Belvidere Hospital in which cough was entirely absent.

flushed face and stupor.
At 8 a.m. temp. 100·4
10 102
noon 102·8
Was sent to Behrden Hospital the same day.
On admission P/R 120/26 Headache: eyes appear heavy and are suffused ears and nails dusky: feet cold: tongue moist and thinly coated: breath offensive: no cough: reduplication of second pulmonic sound, heart sounds otherwise normal: lungs normal: abdomen normal - no enlargement of spleen: no rash.
18th March. P/R 100/20 Headache gone: feels well: breath offensive: chest and abdomen normal.
19th March. P/R 72/32 Face and nails still dusky: breath offensive: no cough: chest and abdomen normal.
20th March. P/R 118/32 Otherwise no alteration.
25th March. P/R 76/28 Slight inequality of pupils: breath not offensive: no cough.

A. McK. act. 12

March Day	8 iv	9 v	10 vi	11 vii	12 viii	13 ix	14 x	15 xi	16 xii	17 xiii	18 xiv	19 xv	20 xvi	21 xvii	22 xviii
Hour	P.M.	A.M. P.M. 3 6 9 12	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.

106
105
104
103
102
101
100
99
98
97
96

chest and abdomen normal.
26th March. Allowed up.
4th April. P/R 80/32 Appears quite well: chest and abdomen normal.
Bowels at first constipated were afterwards regular.
Urine abundant in quantity no albumen except on one occasion when a trace was detected: chlorides diminished.
4th April. Dismissed "well."

Case XII Sudden onset: nothing abnormal detected in lungs: diminution of chlorides in urine: duration about a week.
J. McK. aet. 12
On 5th March he became ill with headache, giddiness, sickness, vomiting and pain in both sides.

6th March.	10 a.m.	temp.	102	pulse 112
	9 p.m.	"	101	" 104
7th March.	10 a.m.	"	100	" 100
	9 p.m.	"	99	" 90

On 8th March was sent to Belvidere Hospital when slight cough was noted

and the chest was found to be clear.
12th March. P/R 56/16 Pulse irregular, but strong and moderately full: pupils dilated: tongue moist, coated with white fur except at tip and edges: breath offensive: reduplication of second pulmonic sound, but otherwise percussion and auscultation reveal nothing abnormal either in heart or lungs: abdomen normal - no splenic enlargement.
15th March. P/R 60/20 Cough slight: chest normal.
17th March. P/R 60/24 Cough gone: breath not offensive: chest normal.
27th March. Chest normal.

Bowels were constipated throughout.

Urine, abundant in quantity, on four occasions contained a trace of albumen but never more: chlorides diminished in quantity.
29th March. Dismissed "well."

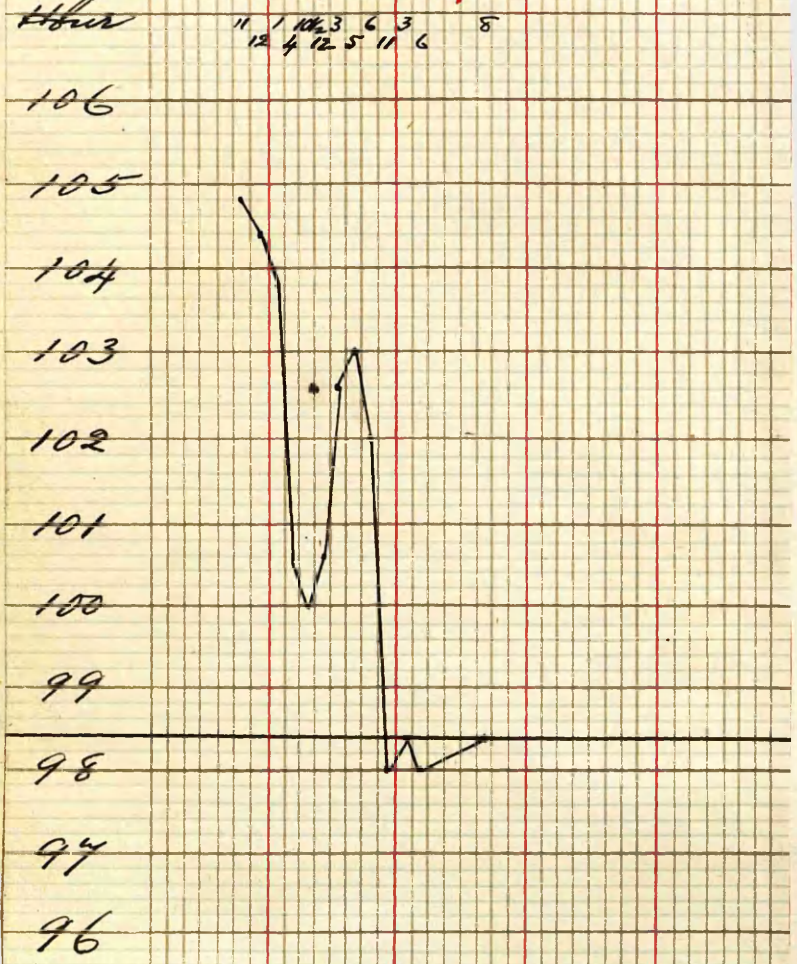
The above cases give a very good idea of those sent to Belvidere Hospital, but a large

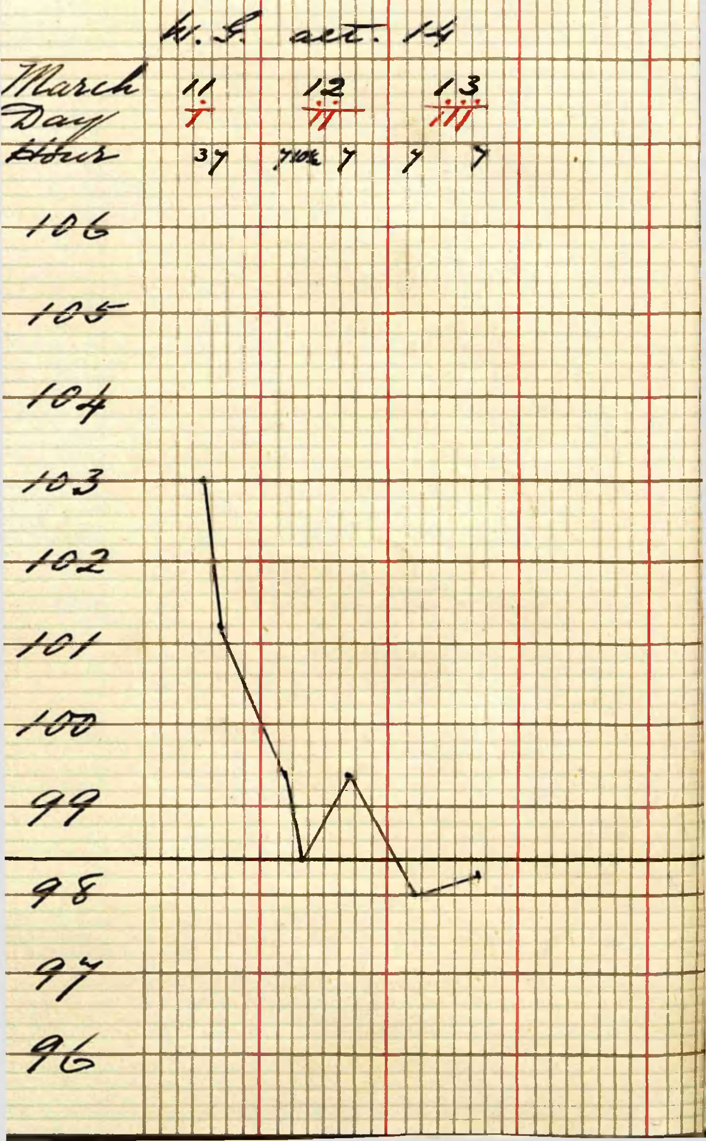
F. K. act. 1½

March 29 30 31

Day I II III

Hour 11 1 10 3 6 3 8
12 4 12 5 11 6




W. S. aet. 14
March
Day
Hour
11
I
12
II
13
III
3
7
7 10½
7
7
7
106
105
104
103
102
101
100
99
98
97
96

proportion of the whole were treated in the School. Most of these were mild cases.

Of the non-fatal cases treated at the Institution the following is the most severe noted:

Case XIII F. K. act. 14

On 29th March about 10.30 p.m. he asked the warder for a drink, which he got. The warder asked if he felt ill and he said "No." About half an hour later a boy told the warder that F. K. was sick and complaining of headache. He was taken to the sick-room and his temperature was found to be 104·8

30th March. Vomited at intervals during the night: flushed face: stupor.

1st April. Allowed up.

The next case had a high temperature at the onset but it rapidly fell.

Case XIV W. G. act. 14

On 11th March at 3 p.m. had headache: was very sick and vomited: temperature

A. M. act. 12

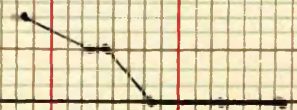
March	9	10
Day	I	II
Hour	A.M. P.M.	A.M.

106
105
104
103
102
101
100
99
98
97
96

J. M. act. 15

March	16	17	18
Day	I	II	III
Hour	8	8 12 8	8 8

106
105
104
103
102
101
100
99
98
97
96



103 : pain in right side : stupor.
12th March. Slept all night : vomiting relieved.
13th March. Took a good breakfast.
Temperature normal.

In other cases again there was a very slight rise in temperature but symptoms similar to those observed in the more severe cases.

Case XV A. W. act. 12
9th March. Headache, pain in the left side, drowsiness. Temperature in the morning 99, evening 98.2
10th March. Temperature in the morning 98.2.

Case XVI J. M. act. 15
16th March. Headache and sickness. Temperature at 8 p.m. 99.4
17th March. Temperature at 8 a.m. 99, noon 99, 8 p.m. 98.4
18th March. Temperature normal both morning and evening.

In a certain proportion of the cases there was absolutely no rise of temperature

although the patients complained of symptoms similar to those noted in the more severe cases.

Case XVII J. G. aet. 10
9th March. Complained of sickness and pain in right side: temperature normal.
10th March. Temperature normal.

Case XVIII J. McK. aet. 12
9th March. Complained of headache and sickness: temperature normal.
10th March. Temperature normal.

Case XIX H. F. aet. 14
9th March. Complains of headache and is drowsy: temperature normal.
10th March. Temperature normal.
11th March. Temperature normal.

There are three cases included in the number in which the only symptom noted is "headache" and in which there was no elevation of temperature. There was no relapse nor second attack noted in any of the

J. McK. aet. 16

March	9	10	11	26	27	28
Day	I	II	III	I	II	III
Hour	A.M. P.M.	A.M. P.M.	A.M.	9½ 2h 6h 8 11 2 11½	7	9

106
105
104
103
102
101
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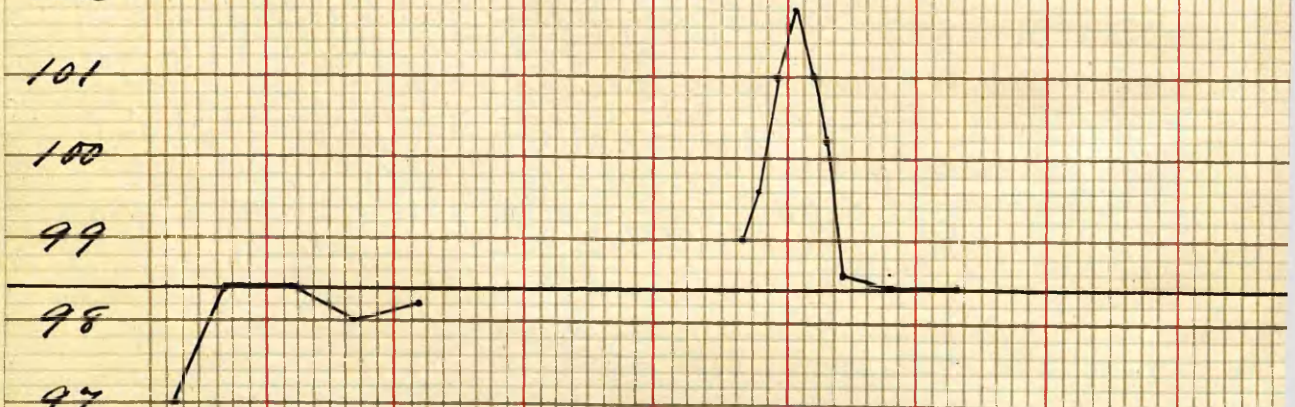
99
98
97
96



cases. In this case only can there be the slightest doubt.

Case XX J. McL. act. 16

9th March. Complained of slight headache: temperature morning 97 evening 98.4

10th March. Temperature, morning 98.4 evening 98

11th March. Temperature, morning 98.2

Possibly there was something else in this boys appearance or condition which attracted notice, for it is hardly likely that he would have been kept under observation for over two days simply because he complained of "slight headache." (a)

On 26th March he complained of headache and sorethroat. Temperature at 5 p.m. 99, 11 p.m. 101

27th March. Temperature, morning 100.2 evening 98.4

28th March. Temperature, morning 98.4

In regard to the cases treated at

(a) See p. 40

St. Marys' Dr Russell writes:[a] "Nothing was more striking with regard to these mild cases than the suddenness with which the patient plunged from perfect health into the disease, and emerged with equal suddenness into health again. The uncomplicated cases in hospital presented the same characteristic. A boy would take a hearty meal; become sick within an hour thereafter; his temperature taken at once might be up to 103°, and his aspect one of utter prostration; within the next twenty-four hours it might reach 105°; within a few hours more return to normal; and forty-eight or sixty hours from seizure he might be at the dinner table again!" "In short periods from a few hours to two or three days health was perfectly restored, frequently after deep sleep and perspiration. In one case there was diarrhea. In some cases, especially after the alarmingly

[a] loc. cit. p. 9

sudden deaths, fear might account for the condition of the boys, but, as a rule, the general aspect of these mild cases suggested a striking family resemblance to the severe cases, and a common origin or affinity."

The cases which I have now described comprise almost one third of the whole number, and include examples of cases of all degrees of severity and duration. The cases omitted here differed in no essential respect from those described, and, in fact, simply formed connecting links between those mentioned. We have "the black centre of fatality, shading off outwards, through the severe cases into the mild cases, and ending in a region of slight duration from health which, dissociated from the central events, would have been misnamed or have escaped notice." (a)

(a) W Russell, loc. cit. p. 9

I shall now describe the various symptoms individually, and here my notes refer chiefly, but not exclusively, to the cases treated at Belvidere. Where my notes permit of it I shall consider both sets of cases, viz, those treated at St. Mary's and those treated at Belvidere, together, but where this is not practicable, it shall be made clear to which the notes refer.

Onset. In all the cases the onset was sudden. This was noted alike in slight and in severe cases — it was a constant and striking feature. In the great majority of cases the disease was ushered in by headache,(a) frequently with sickness,(b) which

(a) Headache was complained of by 63 (sixty-three) out of the whole number — 68 (sixty-eight).

(b) Sickness was complained of by 43 (forty-three).

in many cases was accompanied by vomiting,(a) pain(b) usually in the side, and nervous symptoms of which the most commonly observed was drowsiness(c) in some cases amounting to stupor and in at least two (fatal cases) to coma: rigors(d) occurred in a few cases, and convulsions in one (fatal case): the face in many soon became flushed and hurried breathing was noted in some at a very early stage.

(a) Vomiting was said to have occurred in 17 (seventeen) of the cases treated at Belvidere, and it is more than probable that the term "sickness" includes vomiting in many of the other cases. The vomiting did not persist long after the onset except in one case where it lasted till the fourth day.

(b) See below, under 'Pain', p. 46

(c) Drowsiness, amounting in some cases to Stupor, was noted in 23 (twenty-three) cases out of 54 (fifty-four) observed.

(d) 'Rigor' was noted in 3 (three) cases; 'Shivering' in 2 (two).

In the severe cases the temperature, taken on the first declaration of illness, was always elevated, in one case to 105°F and in some others to a point not very far short of that.

*<u>General Appearance</u> and <u>Condition</u>.

Many of the patients when admitted to Belvidere Hospital had a dull heavy appearance with flushed face,(a) suffusion of the eyes(b) and duskiness or lividity(c) of the face, lips and nails. Drowsiness(d) was common, and some passed into a state of stupor(e) while others became

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*<u>An asterisk</u> indicates that reference is made solely to cases treated at Belvidere Hospital.

(a) <u>A flushed appearance</u> was noted in 22 (twenty-two);

(b) <u>Suffusion of the eyes</u> in 11 (eleven);

(c) <u>Duskiness or lividity</u> of the face, lips or nails, or of all of these, in 19 (nineteen)

(d) See p. 42

(e) <u>Stupor</u> in 3 (three).

restless[a] or delirious.[b] Prostration[c] was noted in some and a distressed appearance[d] in others. The pupils were more or less dilated in 25 (twenty-five) cases out of 29 (twenty-nine) examined. The amount varied from a fulness to wide dilatation. In some it persisted for a considerable time, in others it was only noted on one occasion. The stage of the disease in which it occurred also varied in different cases. Contraction of the pupils was not met with.

Inequality of the pupils was observed in 4 (four) cases, mostly during convalescence. There was a slight yellowish tinge of the conjunctivae (jaundice?) in 2 (two).

Exhaustion was noted in several towards the end of the illness; perspiration in 10 (ten) chiefly about

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(a) Restlessness in 3 (three);
(b) Delirium in 2 (two)
(c) Prostration or Exhaustion in 6 (six), and
(d) A distressed appearance in 2 (two).

the end of the pyrexial period; and pallor in 7 (seven) mostly after the pyrexial period.

Eruptions. Herpes was distinct in 10 (ten) and doubtful in other 6 (six). It was present on the face and chiefly about the lips. Taches bleuâtres were noted in one case. They were present on the chest, abdomen, back and legs, and were noticed on the first day of illness.

Urticaria appeared in one case about the end of the pyrexial stage. Dusky spots and mottling on thighs were noted in one case on the first day of illness, but were not long present.

An eruption, probably due to the irritation of flannel, was seen in one case.

Purpuric spots appeared on the legs of 2 (two) patients who, at the same time, complained of pain in the joints. This occurred during convalescence, after the patients had got up.

2 (Two) patients had boils and one had a sty during convalescence.

Pain. Headache has been noted. Pain, other than headache, was complained of, at the onset of the disease, by 45 (forty-five) of the whole number — 68 (sixty-eight). By 19 (nineteen) in the right side — one of these had sorethroat also: by 9 (nine) in the left side — one of these had sorethroat also, and another had pain in the thighs: by 7 (seven) in one side, the side not being stated — one of these complained also of pain behind the knees: and, by 4 (four) in both sides — one of these had also pain in the shoulders, and another had pain in the back and sorethroat. In 11 (eleven) of the Bethesda cases the exact site of the pain in the side was noted, and was found to be in the hypochondriac region or over the lower ribs in 10 (ten), and in the mammary region in one.

Sorethroat was complained of by 4(four) — 3(three) of these are noted above. pain in the lower limbs by 5(five) in one case in the thigh, in one in the thighs — noted above, in one behind the knees — noted above, and in 2(two) in the legs — one of these complained also of pain in the back, and in this case there was pain in the joints accompanied by a petechial eruption during convalescence. 2(two) complained of pain in the back — noted above; one of pain in the shoulders — also noted above; and lastly, 2(two) complained of pain in the abdomen, the exact site not being noted.

Pain in various joints along with petechiae occurred in 2(two) cases as a sequela. (See p. 66).

*<u>Cough</u>. This was noted in all the cases admitted to Belvidere with the exception of one.

It was slight in 18(eighteen), troublesome in 3(three), and severe

in 9 (nine). In some of the distinctly pneumonic cases in which it was noted it was quite characteristic — short at first, paroxysmal and severe during resolution.

*<u>Expectoration</u>. Only 5 (five) of the Belvidere patients expectorated. This was probably in great part owing to their age, as the cough in a number of the others was loose in character. The 5 (five) cases in which it was noted were distinctly pneumonic cases. In one of these the expectoration was scanty and only noted on one occasion. In the other 4 (four) it was at first scanty and rusty, and in one of these it gradually became less in quantity until it disappeared, while in the other 3 (three) the rusty colour disappeared, the spit became more abundant and less tenacious and afterwards became gradually less abundant until it finally disappeared.

Temperature.[a] The best idea of the course of the temperature is to be got from the temperature charts and temperatures given in connection with the illustrative cases.

Of 23 (twenty-three) cases treated at St. Mary's where the temperature was taken throughout the illness, it was

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[a] The temperature was taken in the axilla by trained nurses, in the cases treated at St. Mary's.

In the cases treated at Belvidere the temperature was also taken by trained nurses. The thermometers (3) used were found to give practically the same readings when compared (within .2°). The temperature was always taken in the rectum and the thermometer was left in situ for (eight) 8 minutes which was found on trial to be quite sufficient time to get the maximum reading. When very unusual temperatures were met with the observation was in many cases repeated to confirm the previous reading.

never found to exceed 99° (axilla) in 14 (fourteen); in other 2 (two) there was found to be a slight elevation of temperature (to less than 100° axilla) at the first observation, which was not noted subsequently; while in the remaining 7 (seven) an elevation of temperature was found on more than one occasion.

The temperature was elevated in all the cases treated at Belvidere Hospital.

In the cases in which fever was noted the temperature was (with one exception mentioned below) always found elevated on the first declaration of illness. Sometimes even then it was at the maximum point reached during the attack, but more frequently the maximum was attained a few hours later,[a] and

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[a] Out of 24 (twenty-four) cases in which the temperature was accurately noted from the beginning, it had attained the maximum reached during the attack in 16 (sixteen) within 12 (twelve) hours of the onset.

in some of the cases not until a later period in the disease. In the one exceptional case however, on the first declaration of illness the temperature (morning) was only 96·8° (axilla), (two) 2 hours later it was 98·6°, 8½ (eight and a half) hours from onset it was 100·6°, and 11 (eleven) hours from onset it was 100·8°, the maximum point reached. The temperature when first taken at the onset of the illness was in many cases 103°, 104°, or even 105° and in some other cases where it was not so high at the first observation it rapidly attained considerable heights. In one case it rose from 102·6 to 105·8 in the first 2½ (two and a half) hours, in another from 101 to 105·2 in 3 (three) hours, and in other cases there were rapid but less striking rises.

In the majority of the cases in which the temperature was taken throughout, the height attained was once or oftener during the course of

the illness found to be very considerable. In the Belvidere cases almost without exception the temperature at some time rose to, or above 103 In 6 (six) it rose to 103 or between that and 104; In 9 (nine) to 104 or between that and 105; In 7 (seven) to 105 or between that and 106; In one it reached and in 4 (four) exceeded 106 — 106·2 in 2 (two), and 106·4 in 2 (two). In the 7 (seven) St. Mary's cases in which pyrexia was noted on more than one occasion the maximum temperatures ranged from 99·4 to 104·8 In 2 (two) of these it reached, and in 2 (two) exceeded 103°

In cases of short duration — one or two days — the temperature rose in a more or less continuous line to the maximum, and then began to fall again more or less continuously, until normal was again reached.

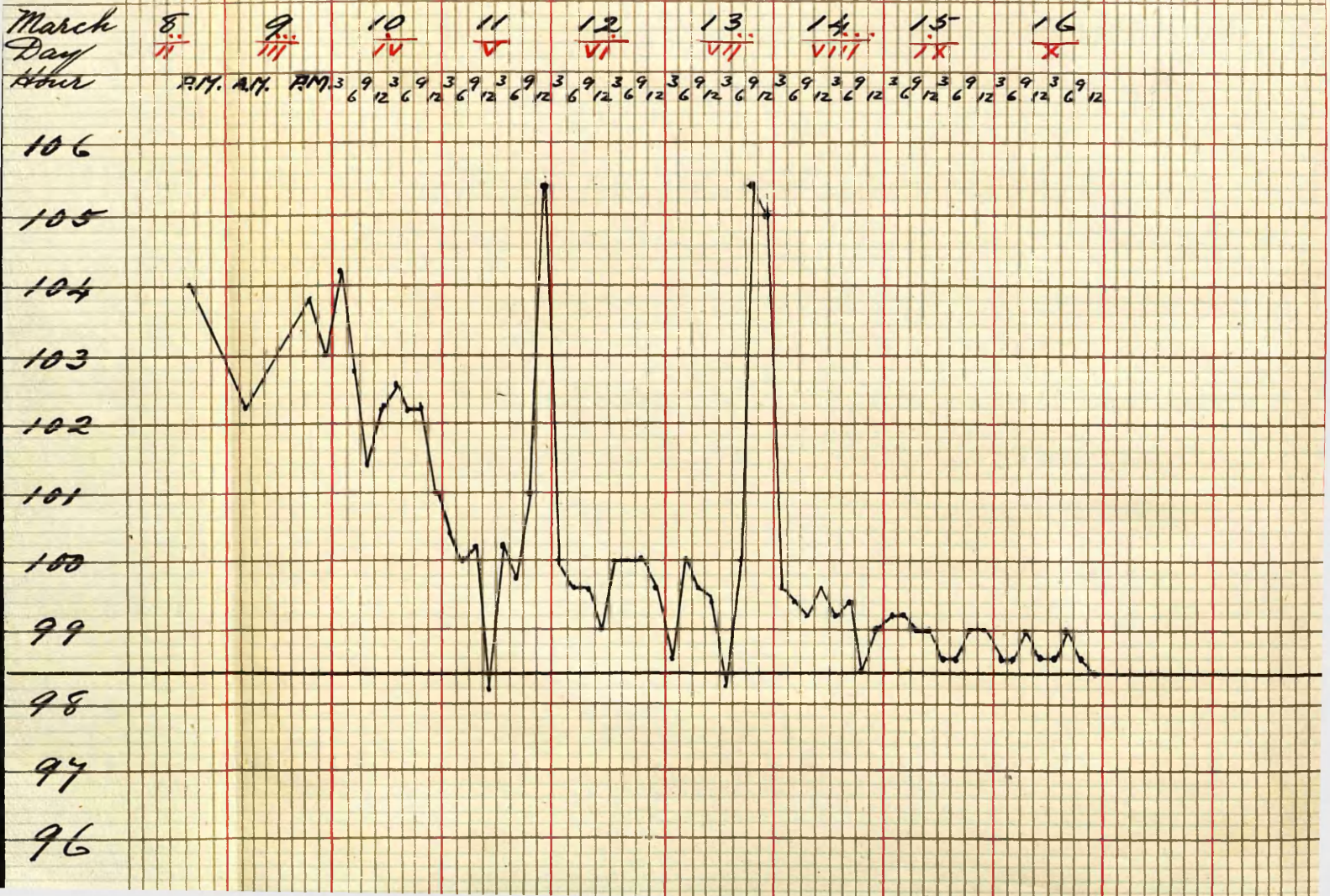
In cases of longer duration there was no uniformity in the course

of the daily average temperature. In some, after the sudden rise at the onset of the disease, it gradually rose until the commencement of defervescence; in others there was a gradual fall from the first day until defervescence actually occurred by a more rapid fall; in others the average daily temperature fell after the first day and then rose again before defervescence occurred; in others, after the onset it gradually rose and then gradually fell until the crisis occurred, and in other cases it did not follow any of these courses and was more or less irregular.

One leading feature in connection with the course of the fever was the great daily fluctuation met with. The daily difference between the maximum and minimum temperatures was frequently 2° (two) to 5° (five) F. and was sometimes even more than this, apart altogether from the crisis, but the amount of

difference varied in individual cases and from day to day. In cases where the difference was not so great the temperature sometimes rose and fell more than once in 24 (twenty-four) hours. Although the fluctuations were so great in many of the cases, the temperature rarely or never fell to normal, and notwithstanding the great variations the average daily temperature was moderately high. For all the typical cases — St. Mary's and Belvidere — the average temperature during the course of the disease was probably (if at all) not much short of 102·5° The variations were met with at all periods in the course of the disease and were more or less marked throughout its course. The remissions took place in the mornings and the exacerbations in the evenings in a great many instances, but this was by no means invariably the case Sometimes the exacerbations occurred

W. W. act. 12


March
Day
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P.M. A.M. P.M.
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in the mornings, but very often there was no relation between the height of the temperature and the time of the day. Sometimes a more decided remission occurred just before the true crisis, the temperature rising again above, to, or almost to, its former height.

In several cases there was a more or less decided rise of temperature just before the crisis.

Transient, more or less decided, elevations of temperature occurred, chiefly during defervescence, in 6 (six) cases. In these the temperature remained up for only 6 (six) or 9 (nine) hours, and fell again to within one degree of its former level. The rise in 5 (five) of the 6 (six) cases was from 3° to 5.6° F. The chart shows two such rises in one case. This is the most marked example.

Transient depressions of temperature also occurred chiefly in the same cases as the transient rises, but these

were never so decided as the rises.

From 27 (twenty-seven) of the Behridere cases where careful observations were made from an early period in the disease, it appears that defervescence took place on an average on the 6th (sixth) day [a] — limits 2nd (second) and 9th (ninth) days: In 15 (fifteen) of the 27 (twenty-seven) from the 5th (fifth) to the 8th (eighth) day, inclusive.

In the 7 (seven) pyrexial St. Mary's cases the average duration of the pyrexia, i.e. the time during which the temperature remained above

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[a] This does not alter the fact stated by Dr Russell that "The average duration of febrile temperatures was 7 (seven) days" because Dr Russell here includes all the days on which the temperature reached or exceeded 100° F. (rect.), a number of which rises I have considered to be oscillations following true defervescence.

99°(axilla), was a little over 24(twenty-four) hours.

In the pyrexial cases almost without exception the temperature fell rapidly at the end of the attack. In a number this fall was very striking — in one the temperature fell 7.8° in 33(thirty-three) hours, in another 6.2° in 18(eighteen) hours, in another 6.6° in 18(eighteen) hours, in another 6.4° in 12(twelve) hours, and in another 7.8° in 9(nine) hours, but in this case it rose again the same evening from the point it had reached — 98.2° — to 103°

In several the temperature reached or exceeded 100°F(rect.) at some time in the 24(twenty-four) hours for some days more, but these rises were probably merely oscillations following true defervescence, occurring in most cases apart from, but in several no doubt in connection with pre-existing disease, or unhealthy constitutions.(a)

(a) e.g. One boy was strumous — had strumous disease of thumb, etc., and another was apparently phthisical.

Andrew Quigley aet.

March	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Day	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV

Time AM PM AM PM AM PM AM PM AM PM AM PM AM PM AM PM AM PM AM PM AM PM AM PM AM PM

106°
105°
104°
103°
102°
101°
100°
99°
98°

Pulse-rate
150
140
130
120
110
100
90
80
70
60

In almost all there were more or less decided oscillations of the temperature following defervescence, and in a few it fell below normal and remained so for several days before again reaching normal limits.

Pulse. The pulse-rate seemed to bear a distinct relation to the temperature, although as far as was observed it did not appear to be subject to the same great fluctuations. It fell rapidly with the temperature at the end of the pyrexial stage. In some cases indeed it fell more rapidly and more decidedly than the temperature did (see chart).

In a certain number of cases — 8 (eight) of the 31 (thirty-one) Belvidere cases — the pulse became slower than normal after defervescence. In one case it fell to 44 (forty-four) per min. the respiration being 20 (twenty) on the 14th (fourteenth) day from the onset.

There was nothing specially noteworthy about the quality of the

pulse – it was usually full and strong in the pyrexial stage, and in many cases was soft or weak, with or without irregularity, during convalescence.

*Respiratory Organs.[a] One of the most striking features in the Behrider cases was the all but invariable presence of abnormal conditions in the respiratory organs. These conditions varied from pulmonary consolidation (as revealed by dulness, tubular breathing, increased vocal fremitus and resonance, and crepitus) to slight catarrh of the passages (producing sibilant

[a] It was only in a few of the cases that the chest was examined every day during the acute stage. In most of the cases it was only examined at intervals of one or two days and as in several of the cases examined the physical signs were somewhat transient it is quite possible that in others they were missed.

or sonorous rales), and between these extremes there were many intermediate conditions met with.

Consolidation was made out in 15 (fifteen)[a] of the cases. In 7 (seven) the right lung was affected, in 6 (six) the left, and in 2 (two) both. There did not seem to be a preference for any special part of the lung. In one of these cases where the physical signs of consolidation were distinct, there was in addition a persistent dulness over one base, with faint breathsounds and diminished vocal fremitus and resonance, and in another case friction was heard on one occasion.

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[a] This does not alter the fact that "pneumonia was distinct in 17 (seventeen) cases," as stated by Dr Russell, because in 2 (two) of the cases where the physical signs of consolidation were doubtful the cases were considered to be pneumonia because of the coexistence of other evidences of pneumonia.

The physical signs of consolidation were detected in most cases on the first or second day of illness, but in several — even where the chest was examined daily — not until the third or fourth and in one not until the fifth day.(a)

The physical signs of consolidation cleared away ~~in the same manner as which~~ more rapidly they usually do after an ordinary attack of acute pneumonia, leaving in many cases a slightly altered percussion note for some time after.

The presence of consolidation was doubtful in 10 (ten) cases — in some more so than in others, and in several the physical signs suggested the possible existence of pleurisy as well, ~~for instance~~

(a) In this case the chest had not only been examined several times by me, but was found to be "clear" on the fourth day of illness by Prof. Gemmell.

there was dulness on percussion — more or less marked, associated with weakness of the breathsounds and râles (dry, moist, or both), with or without prolongation of expiration, but in none was friction heard.

In the remaining cases there was either nothing abnormal detected, or else only râles — dry, moist, or both, with or without weakness of the breathsounds.

Of 14 (fourteen) of the cases where consolidation was distinct, defervescence took place on the sixth to the eighth day in 9 (nine); on the third to the fifth day in 4 (four); and on the first day in one.

Of 9 (nine) of the doubtful cases it occurred on the sixth day in one and on the third to the fifth day in all the others.

Although frequently the severity of the case was in proportion to the pulmonary implication this was

not always so, for in the 2 (two) fatal cases where post mortem examinations were made, there was absolutely no abnormal condition ~~condition~~ in the lungs.

*Heart. A cardiac murmur was persistently present in 2 (two) of the cases but in both was thought to be associated with disease of old standing.

Transient, probably functional, murmurs were noted in 3 (three) other cases.

Reduplication of the second cardiac sound was noted in 10 (ten) of the Bellevue cases. It seemed to occur irrespective of the amount of implication of the respiratory organs and was present in only 2 (two) of the cases where a cardiac murmur was heard.

*Respiration. The respiration was noted in 12 (twelve) of the cases where pulmonary consolidation was distinct, and in all was found to be accelerated out of proportion to

the pulse. In 5 (five) cases noted where the presence of consolidation was doubtful, the respiration was found accelerated in 3 (three); and in the other cases noted where there were no signs of consolidation the pulse-respiration ratio was found to be undisturbed.

*Tongue. In most cases the tongue was at first moist and coated with a whitish or yellowish fur except at the tip and edges which were clean, and the fungiform papillae were distinct or prominent. In a few cases the tongue was at first dry, and in two or three others it somewhat resembled the "strawberry tongue" of scarlatina. After the termination of the disease the tongue assumed its natural clean appearance.

*Offensive Breath. The breath had a peculiar, offensive, odour in all the Belvidere cases with the exception of 5 (five). It was chiefly

noted in the earlier stages, but in a few cases it persisted for some weeks.

*Bowels. The bowels were constipated in most cases, but in some were regular. In one of the Behrider cases the patient had 2 (two) loose motions on the occurrence of the crisis, and in one of the St. Mary's cases diarrhoea was noted. In this latter case the pyrexia lasted little over 24 (twenty-four) hours, and during that time the bowels were moved 4 (four) times. There was nothing noteworthy in the character of the motions in any of the cases.

*Urine. There was nothing in the quantity or naked eye appearances of the urine requiring special note. It was tested for albumen and for chlorides twice daily from admission until convalescence was well established. Albumen was tested for by boiling, and adding a drop or two of acetic acid. A trace was commonly detected while the

temperature remained elevated. After defervescence albumen was not infrequently detected but in such small quantity and at such irregular intervals as to lead to the conclusion that it was due to accidental circumstances.

The chlorides were tested for with nitric acid and solution of nitrate of silver and the quantity was roughly estimated from the amount of deposit thrown down after standing. They appeared to be diminished in 9 (nine) cases, but in none were they entirely absent.

*Liver. The liver was examined in all cases but no abnormal condition was ever detected.

*Spleen. The area of splenic dulness was increased in 5 (five) cases. In 3 (three) of these there were distinct physical signs of pulmonary consolidation

*Sequelæ. Pain in the ankles, or knees or in both was complained of by 4 (four) and in the muscles of

the leg by one, after getting up. In 2 (two) of these the pain was accompanied by a purpuric eruption on the legs, and in one of these two there was edematous swelling of the legs and ankles and there was also pain and swelling of the wrists. The purpuric eruption was followed by a "branny" desquamation. In the other 3 (three) cases there was neither swelling nor eruption.

One had a boil on the face, another had boils on the thighs, and a third had a sty during convalescence.

Treatment. Rest in bed: slop diet: most of the patients got a mixture containing a mineral acid with a bitter infusion: many got ice and iced milk; some had evaporating lotions applied to the head, and in a few cases cold sponging was resorted to when the rise of temperature was excessive. Stimulants — whisky, brandy, sherry or port were given

in some cases, and laxatives — castor oil, or enemata when such were required. When the chest was much affected poultices or counter-irritants were applied, and expectorants given.

Having now concluded my description, it still remains for us to consider the nature of the outbreak.

From the foregoing it is evident that we had here to deal with an epidemic of disease allied to the acute specific fevers. Its epidemic character has been noted by one who is best qualified to judge, for Dr Russell writes:(a) "To one accustomed to see the whole area of epidemic outbursts, those retained at home as well as those sent to hospital, those who did not think it necessary to have

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(a) Dr Russell, loc. cit. p. 9

medical aid, as well as those who did, the aspect of this outbreak was exactly the same. There was the black centre of fatality, shading off outwards through the severe cases into the mild cases, and ending in a region of slight deviation from health which, dissociated from the central events, would have been misnamed or have escaped notice."

Prof. Gemmell also writes:[a]

"It seems to me evident that in the recent epidemic in St. Mary's School we had to deal with a disease allied to the acute specific fevers. The sudden onset with headache, sickness, shivering, and other signs of profound constitutional implication, point decidedly in this

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[a] Prof. Gemmell's "Note on the Clinical Aspect of the Disease" in "The History and Circumstances of a Peculiar Outbreak of Febrile Disease in St. Mary's Roman Catholic Industrial School for Boys, Glasgow, March 1888." By James B. Russell M.D., L.L.D. Medical Officer of Health for Glasgow. Glasgow 1888

direction. Moreover, the speedy issue in the four fatal cases (three of them dying after a few hours' illness), finds its closest analogue in the so-called malignant forms of epidemic disease, which terminate in some instances so rapidly that they would baffle diagnosis were it not for clear association with cases having more ordinary manifestations. The two post-mortem examinations revealed no specific lesions, but the extremely fluid character of the blood in one case, and the general tendency to enlargement of the spleen and mesenteric and intestinal glands in both, are quite in keeping with the idea of acute specific poisoning, although the microscopic examination of the blood and organs revealed no micro-organisms."

It hardly admits of a doubt that all were affected by one and the same disease, because of the similarity of the symptoms, and

the clear association, all occurring in the same school, within one month, although with regard to the two girls Dr Russell states[a] that they may either be regarded as isolated in causation, or associated with the outbreak among the boys. I have included them in my description, because they occurred in an adjoining building at the same time that the cases occurred among the boys, because they presented the same symptoms as were observed in the boys, and because they belonged to a section of the girls who were exposed to influences similar to those to which the boys were exposed (as will be explained when we come to consider the causes of the outbreak). In some of the mild cases it is stated[b] that "fear might account for the condition of the boys, but as a rule, the

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(a) Dr Russell, loc. cit. p. 10
(b) Dr Russell, loc. cit. p. 9

general aspect of these mild cases suggested a striking family resemblance to the severe cases, and a common origin or affinity." Prof. Gemmell also writes of them (a) "No doubt in many of these the disease was of short duration and unattended by high fever, but the general symptoms otherwise were such as to reveal clearly a close aetiological affinity, if not absolute identity, with the more severe cases. They seemed all the victims of the same poison, although in some owing probably to personal idiosyncrasy aided by favourable atmospheric conditions, it issued in pneumonia."

These then are the only two sections about which the slightest doubt has been expressed, and whether they be included in our consideration or not, does not alter the case in the least degree.

(a) Prof. Gemmell, loc. cit. p. 28

It is no matter for wonder that in this epidemic all the cases were not of the same degree of severity, nor that all the symptoms observed were not present in every case. This is only what is met with in other epidemics. In an epidemic of scarlatina, for example, it is well known that we may meet with cases of very different degrees of severity, and in some even the chief local manifestation — the rash — may be absent. Examples of this are mentioned by Graves,(a) and Trousseau,(b) and I personally have had the opportunity of seeing several instances of this. Perhaps the following is the most striking:— A person who had

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(a) Graves' Clinical Medicine. New Sydenham Society 1884. Vol. I pp. 377 et seq., p. 380, pp. 398 et seq.

(b) Trousseau's Clinical Medicine. New Sydenham Society 1869. Vol. II pp. 190 et seq.

recently been ill, came from a town where scarlatina was prevalent to stay at a farm house. Shortly afterwards, five persons on this farm were attacked with scarlatina. Milk was supplied to the adjoining village, and here an epidemic soon prevailed. The disease was of a mild type, but in almost every case a rash was observed. While this epidemic was in progress I saw a number of cases in a village about two miles distant from that above mentioned and with which there was constant communication. In one house all five children had sorethroat; in another house close at hand, the two children, the mother and two servant girls became affected in a similar manner, but no rash nor other evidences of scarlatina were observed in any of these cases. A little girl, a relation of the last mentioned

family, and who lived in a house near, complained of sorethroat and felt "out of sorts." This house was larger than the others and the girl was isolated, which may account for the fact that the other children in the house were not affected. During this time I attended two mild, but quite distinct cases of scarlatina, with rash, in different houses in the same village, and I was informed that another medical man had one case of scarlatina at least. In these cases, had it not been for the surrounding events, the nature of the ailment could not have been determined with any degree of certainty, if at all. Taking such symptoms as were present, however, into consideration, along with the epidemic association with typical cases it is clear that all suffered from scarlatina although in so many it was "defaced." It is

in connection with such cases that Graves writes[a] "It is of great importance, in a practical point of view, to bear in mind the general proposition I have announced, viz., that in both acute and chronic diseases a constitutional affection may display its existence by only one or two of the numerous symptoms which usually accompany it." It would appear then that the diagnosis of defaced cases of epidemic disease has to be based on the presence of some of the characteristic symptoms of the disease and clear association with cases having more of the typical characters of that disease.

In the St. Mary's epidemic some of the cases might have been classed as cases of "Simple Fever" or "Febricula," which Murchison[b] describes as a distinct

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[a] loc. cit. pp. 402 et seq. [b] Continued Fevers of Great Britain. Murchison. 2nd Ed. 1873 pp. 676 et seq.

disease. The sudden onset, with chills or rigors; flushed face; severe headache; drowsiness, etc.; the frequency of "herpes on the lips or nose" and in some cases taches bleuâtres, together with the abrupt termination, would favour this view, but on the other hand the Simple Fever described by Murchison (if indeed such exists) "is a sporadic disease and does not prevail as an epidemic in temperate climates."(a) In the same connection he (Murchison) states that certain specific poisons sometimes give rise to symptoms so indefinite that a diagnosis is impossible unless well marked cases occur in the same house, at the same time, and that "Accordingly, the term Simple Fever has become a refuge for many cases of uncertain character."(b)

(a) loc. cit. p. 679
(b) ibid. p. 678

Wunderlich[a] in writing of the temperature in Febricula, states that "when the contagion has been insufficient, or the individual exposed to it but little predisposed, an ephemera often represents the entire effect of the operation of a specific morbid poison."
Prof. Gairdner[b] thinks that Febricula is not a disease at all, that it is nothing more than pyrexia of which you can give no other account. He also states that Carter mentions cases which have been met with in India, which would have been considered cases of Simple Fever had the spirillum of relapsing fever not been found in the blood.

It is evident from these considerations then, that if a proportion of the cases met with

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[a] Medical Thermometry. Wunderlich. New Sydenham Society. 1871. p. 360
[b] M.S. notes of Prof. Gairdner's Lectures. Glasgow University. Session 1884-85.

in the St. Mary's epidemic are distinct examples of any specific disease, we will be justified in regarding these cases of Febricula as abortive attacks of that disease.

It has been shown above that about one fourth of the whole number of the cases were examples of acute pneumonia, and of these Prof. Gemmell writes:[a] "Apart from their epidemic association, any of the cases might have been selected as exhibiting most of the typical characters of acute pneumonia as it occurs sporadically." Now it has been strongly urged by many eminent authorities that acute pneumonia — the acute croupous pneumonia of the German writers — is a specific fever, the pulmonary affection being merely the chief local lesion.

Juergensen[b] states that Croupous

(a) loc. cit. p. 28.

(b) "Medical Rees and Circular." Practitioner Vol. I 1884 p. 537 and Ziemmssen's Cyclopaedia. London 1875. Vol. V p. 144

Pneumonia is a general disease, the inflammation of the lung being only its principal symptom; that the phenomena of the disease cannot be explained by the local affection, "the adoption of a specific disease originator" being necessary; and that croupous pneumonia belongs to the group of infective diseases.

Dr Sturges[a] in his work on "Pneumonia," after alluding to some points in connection with that disease writes:

"Such considerations as these are opposed to the view that pneumonia is nothing more than a local inflammation: they lend support to the belief that it is to be regarded rather as a specific disease having its chief seat in the lungs."

Prof. Gairdner[b] considers pneumonia to be more a specific fever with its local effect in the lungs, than

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(a) ~~loc. cit.~~ "Pneumonia." Sturges. 1876 p.

(b) Prof. Gairdner, op. cit.

merely a disease of the lungs.
Dr Burney Yeo[a] says "Another view which if not quite so widely accepted, is certainly quite as authoritatively maintained, is that Acute Pneumonia is a general disease, and the lung inflammation is simply the chief local lesion. The inflammatory process in the lung is the local effect of a general cause. The usual arguments in support of the latter view are these. In well-marked cases the fever does not run parallel with the physical signs of pulmonary inflammation. It frequently precedes them by a considerable interval. It does not coincide with them in degree or duration. High fever often accompanies a small tract of inflammation when it is situated at the apex of a lung instead of

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(a) "British Medical Journal." Vol. i 1884. p. 1245

at the base. The fever often suddenly subsides long before the local signs show a corresponding improvement in the lung. Moreover it resembles the specific fevers in its typical course — the rapid onset, the sudden defervescence. Finally, the anatomical changes in the lung are not such as can be produced by artificial injury of that organ."

In addition to this view, that pneumonia is a specific fever, we have the records of numerous epidemics of pneumonia[a], in many of which the cases exhibited "most of the typical characters of acute pneumonia as it occurs sporadically." The clinical features of the disease

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[a] "Collective Investigation Record." Vol. II 1884. pp. 5 et seq.; Hirsch's Handbook of Geographical and Historical Pathology. New Sydenham Society. Vol. III 1886. pp. 125 et seq.; and numerous others.

now under consideration point to no known form of epidemic disease except pneumonia. "The question as to whether it might not be an anomalous manifestation of enteric or typhus fever was suggested, but nothing transpired to encourage such an idea." (a) I think that we are therefore justified in concluding that we had here to deal with an epidemic of pneumonia. The distinctly pneumonic cases give the key to the nature of the outbreak, while the mild cases are to be looked upon simply as abortive forms: the similarity in the symptoms, the clear association with the typical cases, and a comparison with other epidemics, indicate that they were such. The fact that about three fourths must therefore be looked upon as abortive attacks, while only the remainder are typical does not

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(a) Prof. Gemmell, loc. cit. p. 28

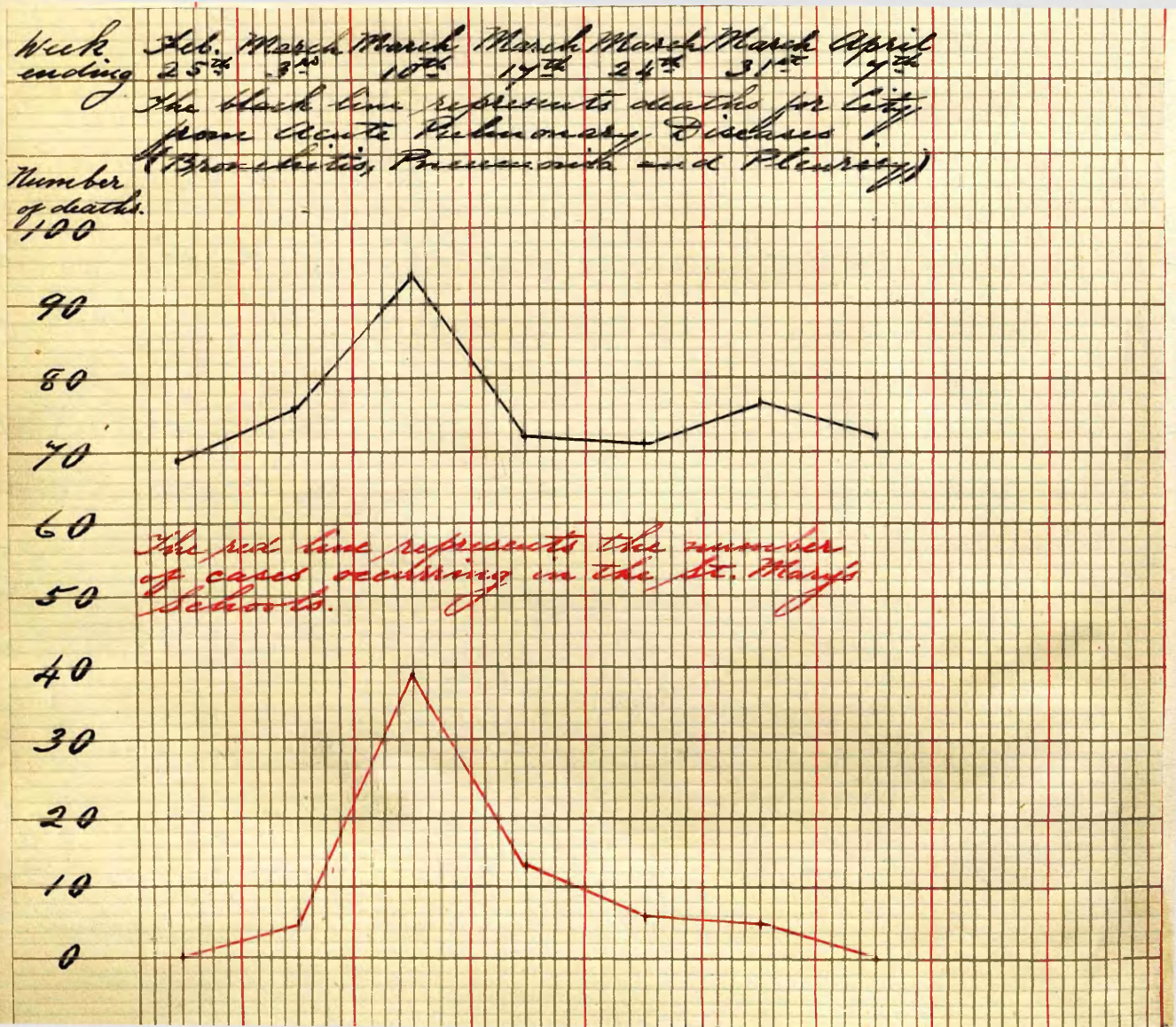
alter this conclusion as such a state of matters is also met with in certain epidemics of other specific diseases. In the village epidemic of scarlatina which I have described the leading characteristic of the disease — the rash — was absent in a very large proportion of the cases and besides Juergensen[a] writes "I have repeatedly noticed that a number of cases" of pneumonia "of short duration are apt to occur together." Neither does the result of the two postmortem examinations invalidate this conclusion, for while deaths from the specific fever "pneumonia" without implication of the lungs have never before been recorded, it has been suspected that such did occur. In this connection we cannot do better than again quote from Prof. Gemmell's "Note."[b]

(a) Ziemssen's Cyclopædia. London 1875. Vol. V p. 124

(b) loc. cit. p. 27

"Moreover, the speedy issue in the four fatal cases (three of them dying after a few hours illness) finds its closest analogue in the so-called malignant forms of epidemic disease, which terminate in some instances so rapidly that they would baffle diagnosis were it not for clear association with cases having more ordinary manifestations. The two post mortem examinations revealed no specific lesions but the extremely fluid character of the blood in one case, and the general tendency to enlargement of the spleen and mesenteric and intestinal glands in both, are quite in keeping with the idea of acute specific poisoning although the microscopic examination of the blood and organs revealed no micro-organisms."

The conclusion at which we have arrived, namely, that we had here to deal with an epidemic of pneumonia, receives support from a consideration of the causes


Week ending
Feb. 25th
March 3rd
March 10th
March 17th
March 24th
March 31st
April 7th
The black line represents deaths from Cerebro-Spinal Meningitis, Pneumonia and Pleurisy
Number of deaths.
100
90
80
70
60
50
40
30
20
10
0
The red line represents the number of cases occurring in the St. Marys District.

of this outbreak, and from a comparison with some other recorded epidemics of pneumonia.

The St. Mary's outbreak occurred in the month of March. Hirsch[a] states that nearly all the epidemics of pneumonia have occurred in Winter and Spring, and that more have occurred in Spring than in any other season.

Dr Russell[b] remarks a sudden and solitary increase in fatality of acute diseases of the lungs over the whole City for the week ending 10th March which was the centre of the St. Mary's outbreak. This is shown by the following table, and by the chart:

Week ending	Acute pulmonary deaths for City.	Number of cases occurring at St. Mary's.
Feb. 25th	69	0
Mar. 3rd	76	5
10th	94	39
17th	72	13
24th	71	6
31st	77	5
April 7th	72	0

(a) Op. cit. (b) Loc. cit. p. 25

This would point to some condition or conditions affecting this School in common with other parts of the City.

Attention is also directed to the fact that the children were unhealthy and living under unhealthy conditions,[a] and this would no doubt have an effect in predisposing to disease. The Schools are in close proximity to a graveyard,[b] and these are walled in together by a barrier of tenements and workshops. This is interesting, as the proximity to a graveyard has been noted in other epidemics of pneumonia, e.g. by Bielenski,[c] Lenhartz[d] and Robinson.[e]

Dr Russell also shows that the air space was deficient in both Schools,

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(a) Dr Russell, p. 25 (b) Dr Russell, pp. 13, 14

(c) "Collective Investigation Record." Vol. II 1884. p. 23 (d) Ibid. p. 15

(e) Surgeon-Major Robinson in the "Army Medical Department Report for 1886." London 1888. p. 360

but "the overcrowding", he writes, "is much greater in the boys than in the girls' school ..... the internal arrangements are more defective, the accommodation and general sanitary condition of the building inferior." (a)

Hirsch (b) in discussing the relation of insanitary surroundings to epidemic pneumonia writes:

"There can be no question ..... that the origin of the malady is associated, under certain circumstances, with influences of locality, more especially with the noxious influences proceeding from bad sanitation — overcrowding of rooms, want of adequate ventilation, accumulation of decomposing organic matters, and the like; or, in other words, with all those errors of hygiene which are well calculated to further the development of infective diseases in general. In evidence hereof there is not only the epidemic

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(a) loc. cit. p. 26 (b) loc. cit. pp. 149 et seq.

outbreak and prevalence of pneumonia in confined and circumscribed buildings – barracks, prisons, and such like – where the factor in question has been peculiarly noticeable at the time of the outbreak and, so long as it lasted; but also the fact that in a number of epidemics which have spread over whole villages, those streets or houses have suffered most that were principally exposed to the particular harmful influences. ..... in the epidemic among the soldiery at Madgeburg in 1873-74, the visitation fell mostly upon one barrack ("Mark") which was far behind all the rest in its sanitation (Grundler). ..... it may be pointed out that the greater prevalence of inflammation of the lungs in the colder months of the year finds an explanation in the same hygienic errors, which people not unfrequently fall into in their endeavours to

protect their living rooms and bedrooms from the inclemency of the weather. We are unable for the present to form any opinion of the manner in which this etiological factor becomes effective in setting up the disease. Experience shows, however, that the proper morbific cause is neither associated necessarily with it, nor absolutely dependent upon it. ..... The importance that we can assign to the influence of these defects upon the development of the malady is, accordingly, but a secondary one; either its effect is to create a predisposition in the individual to take the disease, or to intensify a predisposition already there; or it creates a soil specially adapted for the development of the proper morbific agent."

Juergensen[a] considers pneumonia to be a "dwelling" disease, that is, that

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[a] "Medical Press and Circular." Vol. I. 1884 p. 537

it clings to a locality. He reached the conviction, from observing an epidemic of pneumonia in Amberg, that the sleeping room was the breeding place of the disease. Three or four years later the pneumonia cocci were found under the flooring of the room, cultivated and transplanted to animals, and thus furnished the proof that his conviction was sound.

In the case of the St. Mary's Schools[a] "Pneumonia and other lung diseases are chronically prevalent..... and especially severe among the boys". It is highly probable therefore that this observation of Dr Russell's point to the fons et origo mali that for a considerable time past the specific poison has been present in the Schools, causing pneumonia to be "chronically prevalent", and that the favouring

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[a] Dr Russell, loc. cit. p. 21

conditions only required to combine to give rise to an epidemic.

The season, the condition or conditions which influenced the whole City, the proximity to the graveyard, and the unhealthy constitutions of the children together with the unhealthy situation of the buildings are factors which would tell alike on both boys' and girls' schools: but, the overcrowding is much greater in the boys' than in the girls' school, i.e., the external free space is much less, the internal air space is much less per head; the internal arrangements are more defective, the accommodation and general sanitary condition of the building inferior; the general mortality among the boys is higher; the proportion of the total deaths caused by pulmonary diseases, and especially by acute diseases of the lungs is consider-

ably higher." (a)

The facts set forth by Dr Russell (b) point to a common origin rather than to infection from person to person in the case of the boys; but, in the case of the girls, if infection from the boys be admitted, then the section to which the girls attacked belonged — the kitchen girls — would be most likely to suffer, as they had to do with setting the tables for the boys, and clearing away the dishes, and in the case of one of the girls the mother was allowed to see her on two occasions immediately after having visited her son in the boys' sickroom. If, on the other hand, a common origin for both boys and girls be deemed more probable, a consideration of the causes mentioned will show a greater predisposition on the part of the boys, and besides

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(a) Dr Russell, loc. cit. p. 26 (b) Op. cit.

we find that the section of the girls attacked would be most exposed to influences similar to those which seem to have been the determining cause in the case of the boys, namely, exposure to great variations of temperature. "The boys' lavatory is a cold, damp, uncomfortable ~~looking~~ place, without hot water at the taps, situated in the courtyard. To turn lads of low vitality, with weak chests, out of their warm dormitories to perform their ablutions there at six o'clock on a winter morning must be dangerous. The girls have washing places convenient to their dormitories on the same landing, where they are not exposed to chills."(a) The kitchen girls, however, must have been exposed to considerable variations of temperature in the discharge of

(a) Dr Russell, loc. cit. p. 16

their ordinary duties.
Exposure to variations of temperature has all along been recognised as one of the most potent determining causes of pneumonia. This has been remarked both in sporadic cases, and in epidemics, although it has also been recognised that it is insufficient in itself to produce the disease. In referring to this Juergensen writes:[a] "Fright may bring on labour in a pregnant woman, but it ought not to be held responsible for her pregnancy." Dr Austin Flint in writing of pneumonia, states that[b] "when it appears to follow exposure to cold, it is probable that this acts only as an exciting cause, co-operating with the action

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(a) Ziemssen's Cyclopaedia. London 1875. Vol. V p. 145
(b) Principles and Practice of Medicine. Austin Flint. 5th Ed. p. 168

of a special cause." If we take all these circumstances into consideration we can readily understand why only such a small proportion of the girls suffered.

If we compare this outbreak with some other recorded epidemics of pneumonia, we find an amount of similarity which further strengthens our position. It must first be recognised, however, that great differences in type have been found in different epidemics of pneumonia, as indeed are found more or less marked in different epidemics of all other infective diseases.

Penkert[a] records an epidemic in which "The cases were mostly typical, some abortive."

In the village epidemic reported by Senft[b] "the average duration was

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[a] loc. cit. p. 15 [b] "Collective Investigation Record" Vol. II 1884 p. 18.

11.7 days; crisis occurring in most from the third to the eighth day."

Adolf Kühn[a] gives an account of an epidemic in the Moringer Reformatory where, coincident with the severe and well-marked cases, there were others of slight illness, mostly recorded as catarrh, but which from their general similarity were regarded as abortive forms of the graver disease.

Raven[b] records a group of five cases occurring in one house, four of which seem to have presented pretty much the usual characters of acute croupous pneumonia as it occurs sporadically, while the fifth was of short duration, and of this case he remarks that "it was thought probable that this child's attack was one of pneumonia without inflammation of the lungs." He

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(a) "Collective Investigation Record." Vol. II 1884. p. 19 (b) "British Medical Journal." Vol. II 1883 p. 269.

also remarks the absence of typhoid symptoms in this group.

Dr Finlayson[a] reports a series of cases — five in all — occurring in the same house: (1) had pleuro-pneumonia and recovered after a tedious illness: (2) had pneumonia of the right side. The crisis occurred about the seventh day. (3) and (4) had "high fever, great restlessness, frequent and very painful cough, but no distinct signs of pneumonia could be made out." The acute illness terminated suddenly in about four or five days. (5) had consolidation on the right side and died in about nine days.

Couldrey[b] reports a group of ten cases, in which a well-marked crisis occurred on the eighth or ninth day, the temperature falling below normal

Daly[c] records a group of six cases, and

(a) "Collective Investigation Record." Vol. ii 1884 p.100
(b) "Lancet." Vol. ii 1878. p. 701
(c) "Lancet." Vol. ii 1881. pp. 824, 825.

in two of these of which particulars are given the disease "terminated in seven or eight days in a well-marked crisis," and he gives his reasons for stating that his cases support the theory that this disease is a specific fever, of which the lung disease is only the local effect.

One or two distinct cases of pneumonia, associated with a slight attack of illness of a more or less indefinite nature occurring in the same house at the same time, have several times come under my notice in the City of Glasgow Fever Hospital, Belvidere, to which the patients have been sent as cases of "Enteric" or simply as "Fever". I may give the following brief notes of two such groups:—

Group 1. Case (1) C. D. aet. 11 admitted 14th April. His illness began four days before admission with headache, and pain in the abdomen. On admission his temperature was 103°: his tongue

was furred; his eyes were suffused; abdomen slightly distended; some bronchitic rales at bases. Some days later a small patch of consolidation was made out in the posterior part of the left lung. The temperature fell by crisis on the seventh day (from 102·6° to 98°), but rose again to its former height, and fell to normal again on the ninth day, after which it remained normal. Case (2) Brother of the preceding, P. D. aet. 10 admitted 15th April. His illness began the day before admission with sickness and vomiting. On admission, temperature 103.; tongue furred; eyes suffused.; 16th April. Consolidation of whole of posterior part of left lung; rusty spit; violent delirium. Pleurisy developed subsequently. The temperatures ran high; and defervescence commenced on the tenth day and was rapid— on tenth day, evening temperature was 103·6, forty eight hours later 98·4.

Case (3) Another brother J. D. act. 4 admitted 18th April. His illness began on the previous day, and on admission his temperature was 100, the same evening 98. 6. 19th April. Temperature 99.2 98.8 No consolidation was made out in this case — what chest signs there were, being of a tubal nature.

Group II. Case (1) I. B. act. 6 admitted 2nd Nov. Illness began four days before admission, with shivering, vomiting, and pain in sides and abdomen; slight cough; constipation. On admission P/R 120/44; tongue furred; pupils dilated; slight cough; consolidation of upper lobe of right lung; abdomen full but no great tenderness. 4th Nov. P/R 136/64; course of temperature marked by great daily fluctuations, crisis on tenth day.

Case (2) Brother of the preceding. I. B. act. 4 admitted 2nd Nov. Illness began suddenly, the day before admission with sickness, vomiting, pain across the upper part of the

abdomen, and cough. On admission, tongue furred; chest and abdomen normal. Nothing further was made out, and temperature remained absolutely normal from admission.

Surgeon-Major S. J. Robinson[a] has reported an outbreak of pneumonia which occurred at Richmond Barracks, Dublin, in 1884, and as it is of special interest in its bearing on the epidemic now under consideration I shall take more detailed note of it. Dr Robinson writes: "The most striking features were rapid onset, acute febrile symptoms, and special liability to pleuro-pneumonia. It lasted throughout March, April, and May, when it entirely disappeared." Three cases of pneumonia had occurred in the months of January and February but these are excluded from the report of the epidemic,

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(a) "Army Medical Department Report for the Year 1886." London 1888. Vol XXVIII pp. 360 et seq.

which includes forty-one cases occurring in the time mentioned. "It is also observable that three out of the four fatal cases were admitted at the commencement of the outbreak; the fourth early in April." "In all there was remarkable similarity of type varying only in degree. Thus:— A man falls out on morning parade and is brought to hospital in a state of semi-collapse. Temp 104–106, P. 120. Vomiting, intense headache, congestion of eyes. Sharp pain in one side, increased on inspiration. Cough with or without expectoration. States that he was in usual health over night, but did not feel well when he got up. On examination of chest:— Slight dullness and harsh breathing at base of one lung. Subsequently:—
(1) In severe cases.— Lung symptoms further developed. Consolidation of the lung first affected, almost

complete, the other later on. Temp. persistently high, or, more frequently, with variations of several degrees, and rigors. Sputa identical with those of ordinary pneumonia. Vomiting obstinate. Patient stupid but not generally delirious. Convalescence slowly arrived at, the lung symptoms slowly subsiding.

(2) In abortive or mild cases.—Consolidation of affected lung slight, the symptoms relapsing into those of catarrhal bronchitis. Temperature falling about the third or fourth day."

Some of the more important symptoms are next discussed in detail:—

"(1) Headache.—A constant symptom, accompanied by flushed face and suffusion of conjunctivae. Delirium not frequent.

(2) Vomiting.—Frequent on admission, but with varying persistence.

(3) Diarrhœa.—Rare on admission, but supervening in a considerable number of cases.

(4) Sputa.— Characteristic of pneumonia (i.e. viscid and rusty in as many as thirty-one out of the forty-one cases recorded. It was variable in quantity and persistence, subsequently becoming bronchitic. In one of the fatal cases (with marked consolidation) the patient did not expectorate at all.

(5) Pleurisy is noted as accompanying the pneumonia in twelve cases; it was probably more frequent, but masked by the latter.

(6) Jaundice occurred in several cases.

(7) Temperature.— In nearly every case it was at or about the highest on admission. In only four cases was it below 103°

In sixteen cases it rose above 105°
In six of these it rose above 106°
In two cases it rose above 107°
The average day on which temperature fell for all cases was the seventh."

Both lungs were affected in twenty-one, or one half of the entire number: this "is

remarkable considering the low rate of mortality..... This is admitted to be a peculiarity of pneumonic outbreaks, but there is little doubt that in some cases the attack on the lung was abortive, the inflammation not passing beyond the stage of congestion. As, however, no return is permitted by the nomenclature under the latter head, all cases where the lung was affected in this way were returned as pneumonia. This is an important point to bear in mind."

In two of the fatal cases the intestines were examined (as well as the other organs), and in one of these "the Peyer's patches were enlarged, without ulceration;" while in the other, the solitary glands were enlarged as also the mesenteric lymphatic glands.

It is noted of the site of the barracks that there are several objectionable surroundings, and among these is a cemetery. Dr Robinson writes:

"The proximity of a cemetery is known to have caused illness, and on analysis the air of such places is found impure." One point regarding the buildings is noteworthy — "The ablution arrangements are defective, as the men have to go long ways (often with little on) to wash." Further, it is noted that "drainage at Richmond Barracks is bad...."

In the Spring of 1886 Dr Robinson "was much struck by the number of admissions".... "having the same symptoms as in 1884 but of less severity, and minus the chest affection. These were returned as simple continued fever." "It is noticeable however, that of the twenty-five cases of simple continued fever in 1886, (first half of year only) twenty-four occurred in the three months, March — May."

Many other epidemics of pneumonia are on record, more or less closely resembling that which occurred at St.

Marys, but for our present purpose it is needless to mention any more.

In conclusion I would remark that this epidemic is of special interest, because in it are included the first recorded examples of death from "pneumonia" without any implication of the lungs whatever, as shown by post-mortem examination; because it forms a connecting link between well-marked epidemics of pneumonia and certain hitherto undefined epidemics, which have occurred in recent years, mostly in Roman Catholic Industrial Schools; and, because it shows that we must correct many of the now commonly accepted views of "pneumonia", and by so doing we will considerably reduce the number of those cases, which at present we have to confess our ignorance of by calling "Febricula."