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During my residence as Assistant Medical Officer in The City of Glasgow Fever Hospital, in Kennedy St. and Belvidere, it was my privilege for a short period to have charge of the diphtheria ward, and as the new treatment of diphtheria by Antitoxin was being inaugurated in the Hospital at that time, the cases which came under my observation & were so treated were watched with the keenest interest, and most extensive notes made, & as these have not been published they seemed to me a suitable subject on which to base my Thesis for the degree of Doctor of Medicine.

Just a number of French & German, as also British authorities have contributed articles to our Medical Journals of varying degrees of value, but all tending in the main, I think, to speak well of the Serum Treatment. Before considering these however, it must be remembered, that in few diseases have so many cures been vaunted as in diphtheria, while the fact that at the same time an epidemic may assume such totally different characteristics over different areas, will make ^{the} most enthusiastic supporters of the treatment careful before rushing to too hasty opinions. It cannot be denied, however, that the death rate has been greatly

reduced, different writers estimating 15-20% now, as compared with 35-50% formerly as being a fair average of the death rate from diphtheria since the establishment of the serum treatment as compared with what it was prior to that period.

The following 10 cases I propose to give in detail & I hope to show that in some of them there was a marked change for the better after the use of the Antitoxin, which in all of the cases was procured from the British Institute of Preventive Medicine, London.

I shall close my paper with a short Summary in the hope of fastening together the leading facts & so rendering comparisons of the different cases easier.

The treatment, as will be seen, was both local & constitutional besides the Antitoxin. The following being the contents of a ward mixture which was invariably given & to which I shall have frequent occasion to allude.

R_o

Liq. Hydrarg. Perchlor.	m 5
Tinct. Ferr. Mur.	m 1 1/2.
Liq. Strychnin. Hydroch.	m 1.
Elyc. Et. (psu. acid.	m 5
	m.

Sig

One dose.

Repeat every 2 hours.

Case 7. History previous to Inoculation.

E. D. aet. 4½ yrs. was admitted to Hospital at 5 P. M. on December 28th 1894, with a history of an illness beginning 5 days previously with sore throat and "croupy" cough. The pulse was 132 and of good quality. The respirations 40 per minute & rather noisy, and the temperature on admission 102.6 °F.

Patient looks pale — not markedly so — and lies quietly in bed with the head somewhat extended & breathing hurriedly. There is no movement of the alae nasi. No lividity of the lips. Pupils dilated.

There is distinct retraction of the lower intercostal spaces. On auscultating the lungs, the R. M. is heard to be harsh generally in front of the chest, while behind, at the bases of the lungs, fine rales-crepitant rales are heard.

Heart sounds normal, altho soft. The tongue is moist & coated with a brownish white fur. Fauces generally are reddened, both tonsils being distinctly enlarged. Covering the surface of the latter, as also the posterior surface of the uvula, and the posterior pharyngeal wall, is a thick greyish-white membrane, which is stripped off with difficulty, leaving behind a raw bleeding surface.

29th December.

Today the patient is

much more marked & lividity of the lips distinct. Patient has been restless & coughing frequently. The respiratory movements are more rapid (40), and the obstruction, too, greater. Temp. $101^{\circ} F$.

Intercostal retraction greater. Condition of the lungs unchanged. Little difference in the facial appearance.

2:30 P.M.

Within the past few hours there has been a marked change for the worse. Lividity increased. Respirations 48. Pulse 150 & of low tension.

2:40 P.M.

20 ccs. Antitoxin injected into the abdominal peritonea at two distinct points.

The previous treatment (i.e., since admission) was

ward mixture two hourly.

Steam inhalation do.

Throat poultices hourly.

Patient swallows with difficulty.

Notes after Inoculation.

3 P.M. Temp. $100^{\circ} F$. Pulse 100. Respirations 48.

5 P.M. " 100° " 120 " 56.

Respirations altho' more accelerated are less obstructive. Inclined to sleep constantly, having to be roused to take nourishment, which she does rather greedily.

7 P.M. Temp. 100.4° Pulse 140 Resp. 52.

Restless & becomes much more livid, altho' the colour of the lips improves after each dose of stimulant.

8 P.M. Not any worse looking.

Auscultation reveals the fact that the R. M. is hardly perceptible over the right side of the chest either in front or behind. Over the base of the left lung a few mucous crepitant rales are heard, but there are none at the front where there is a much diminished R. M.

Pulse soft and easily compressible. Retraction of the lower intercostals decidedly less.

8:30 P.M.

Died suddenly, cardiac causes evidently being the cause.
No P. M. obtained.

Case II.History of Case previous to Inoculation.

a. w. f. aet. 2 yrs. weight $27\frac{1}{4}$ lbs.,
was admitted to Hospital on Dec. 28th
1894 at 3 P.M. with a history of an
illness commencing 5 days previous
with larynx & sore throat.

No difficulty in swallowing observed.
The temp. on admission was $98.4^{\circ} F$, The
pulse 120 & the respirations 24.

Patient is quite a well developed
child, with an absence of any pallor
of the face, and breathes quietly,
lying in bed taking quite a lively
interest in her surroundings.

Breathing quiet & unembarrassed.

Pulse of good quality.

Heart normal & the lungs are free
from rale.

The tonsils are enlarged, & implanted on
the right gland are three circular patches
of yellowish membrane, there being one
small patch on the left.

There is a discharging tubercular gland
on the left side of the neck, this being
present, the mother states, for about
a month.

The urine is free from albumen.

State of Patient at the time of Inoculation.

The condition of the child has triflingly
altered since admission. The breathing
continues very good, being somewhat
laryngeal in character, but not to

any extent obstructive.

Appearance of the fauces as before.

29th Dec.

2.30 P.M. 20 ccs. of Autotoxin injected into the abdominal wall underneath the skin. Patient resented the operation, but within a few minutes of the inoculation was sitting up in bed quite cheerily. As in other case the ^{which held only 10 ccs.} syringe was withdrawn & reinserted.

Treatment adopted from admission was:-

Swabbing Throat with carbolised glycerine — Three hourly.

Spray of Soda Bicarb. — Two hourly.

ward mixture (See page 3) — Two hourly.

Notes after Injection.

3 P.M. Temp. 98.2° F. Pulse 107 Resp. 26

5 " " 99.4° " 90 " 28.

Sleeping quietly since shortly after the injection. Taking nourishment well & without evident discomfort in swallowing.

7 P.M. Temp. 98° F. Pulse 108 Resp. 24

9 " " 99.2° " 120 " 22.

Still sleeping. Breathing altho' not accelerated is distinctly obstructive in character. Pulse continues good.

11 P.M. Temp 98.8° Pulse 107 Resp. 24.

30th Dec.

1 a.m. " 99° " 109 " 24

3 " " 99° " 124 " 26

5 " " 98.8° " 110 " 24

7 " " 99.2° " 109 " 24

9 am. Temp. 99.4° Pulse 128 Resp. 20.

Patient has slept uninterrupted throughout the entire night, having to be wakened to take nourishment, when she seemed rather cross.

Coughing frequently, and that of a croupy character.

No difficulty in swallowing.

Breathing quiet & regular. Pulse strong & full. No flushing of the skin. Colour of the face continues fair. At the site of the injections the skin is red and tender.

Tongue clean & moist.

The three patches observed yesterday on the right tonsil, and the one on the left, are pin-point in size & the fauces are not so red, & during the process of examining the throat, when the patient is retching, the tip of the epiglottis comes into view, and that is covered with membrane.

11 am. Temp. 99.2° F. Pulse 120 Resp. 24

1 P. M. " 99.6 " 124 " 32.

3 " " 99.4 " 118 " 28

5 " " 98.8 " 98 " 26.

7 " " 98 " 104 " 28.

Has been sleeping at intervals during the day.

8 P. M. 10 ccs. antitoxin injected.

Face flushed somewhat.

9 P. M. Temp. 98° F. Pulse 106 Resp. 20

11 " " 98.6 " 100 " 22.

31st Dec.

1 am.	Temp.	98.4°	Pulse	107	Resp.	24
3 "	"	98°	"	100	"	24
5 "	"	99.2°	"	110	"	22
7 "	"	99.4°	"	108	"	27
9 "	"	99.4°	"	124	"	20

Right nurse reports that patient slept well during the night, except for the occasional disturbance of a cough, which however was not croupy. The colour of the face improved after the first part of the night. Had to be awakened for nourishment. Breathing quiet & regular. No urine obtained.

In the course of the visit, patient while left alone, momentarily sat up in bed, and the colour of the face was decidedly good. The throat is quite clean, excepting for the tip of the epiglottis, which shows a small patch of membrane the size of a pin head.

Tonsils are punched-out like, & red. Slight tenderness over the abdomen, but no redness & no swelling.

11 am.	Temp.	98.2°	Pulse	132	Resp.	28
1 P. m.	"	99.6°	"	128	"	28
3 "	"	99.4°	"	120	"	24
5 "	"	97.8°	"	112	"	28
7 "	"	97.6°	"	96	"	24

Has passed a good day, sleeping a great deal, & taking nourishment well, altho' not asking for any.

No flushing further has been observed.
No urine obtained since admission,
when it was free from albumen.

9 P. M. Temp. 97.6° F. Pulse 92 Resp. 20
" " " 98.6° " 100 " 20.

1st July 1895.

1 am. Temp. 98.2° Pulse 100 Resp. 20
3 " " 98.8° " 107 " 22.
7 " " 98° " 100 " 24.
9 " " 98° " 94 " 19.
11 " " 98.6° " 104 " 20.

Slept well throughout the night, the
breathing being quiet & regular. No cough.
Throat clear. No abdominal tenderness.
urine 1/6th albuminous.

3 P. M. Temp. 98.8° Pulse 100 Resp. 22
7 " " 97.6° " 100 " 24.

Slept well in the early afternoon,
but later on was crying to be
allowed to sit up in bed.

markedly improved.

11 P. M. Temp. 98.5° F. Pulse 100 Resp. 20.

2nd July.

3 am. " 97.2° " 104 " 22
7 " " 97° " 108 " 20.

All signs of respiratory distress
have now gone, and the facial
symptoms, too, are no longer present.

11 am. Temp. 98.5° F. Pulse 110 Resp. 20
3 P. M. " 97.6° " 110 " 24
7 " " 98.4° " 92. " 22.

Patient has been sitting up in
bed the greater part of the day.

evidently very well.

11 P. M. Temp. 98.2° Pulse 100 Resp. 19.

3rd Jan'y.

3 am	"	98°	"	104	"	22
7	"	98°	"	100	"	22
11	"	98.2°	"	106.	"	20.

Slept well all night & taking plenty of nourishment. Throat clean. Urine when obtained is albuminous. Sitting up in bed amusing herself with her toys.

3 P. M. Temp. 99.8° Pulse 100 Resp. 20

7 " " 99° " 101 " 20

11 " " 98° " 80. " 20.

Passed a good day.

4th Jan'y.

3 am. Temp. 98.6° Pulse 82 Resp. 22.

7 " " 97.4° " 90 " 24.

10 " " 98.2° " 88 " 24.

This morning atelio patient is apparently little altered. The stethoscope reveals the presence of low sonorous râles at the front of the chest, while behind, at both bases, a few mucous crepitant râles are audible. The lungs are perfectly clean—epiglottis the same.

3 P. M. Temp. 98.2° Pulse 116 Resp. 36.

7 " " 98° " 88. " 28.

Had a quiet day, breathing naturally much brighter. Urine shows trace of albumen.

11 P. M. Temp. 98.4° Pulse 88 Resp. 24.

5th Jan'y.

3 am. Temp. 98.4° Pulse 88 Resp. 20.

7 " " 98.2° " 89 " 22

" " " 97.8° " 104 " 20.

slept well all night. Coughing occasionally, but not croupy. Throat clear.

Urine clear of albumen today.

3 P. M. Temp. 98.5° Pulse 112 Resp. 24

7 " " 97.4° " 96 " 28.

" " " 98° " 84 " 29.

Doing very well.

6th Jan'y.

3 am. Temp. 98.2° P. Pulse 88 Resp. 26

7 " " 98.4° " 86 " 28

" " " 98° " 100. " 20.

slept well all night. Chest free from rale now, & the breathing is quiet. Urine remains clear.

3 P. M. Temp. 98° P. Pulse 102 Resp. 20

7 " " 97.8° " 100 " 24.

Doing very well, there being now an entire absence of cough.

11 P. M. Temp. 98° Pulse 104 Resp. 24.

7th Jan'y.

3 am. " 98° " 100 " 24.

7 " " 98° " 98 " 20.

slept well all night. Not any cough. & The lungs appear normal on auscultation. Heart sounds pure.

Urine continues to be free from albumen. Throat clear.

11 am. Temp. 98.5° P. Pulse 88 Resp. 20.

3 P. M. " 98.2° " 98 " 18.

Convalescence was uninterrupted from this date, The Temp: pulse and respirations being normal.

on 12th June. patient was allowed out of bed for a little and on the 16th all day.

Dismissed well
January 30th.

Case III.History of Case previous to Inoculation.

M. S. aet. $1\frac{3}{4}$ yrs., weight 27 lbs., was admitted to Hospital at 11.30 P. M. on 31st December 1894, with a history of an illness beginning 12 days previously with feverishness and cough.

Six days later the sore throat began to be complained of. No other symptoms. The temperature on admission was $98.4^{\circ} F$, pulse 120, & respirations 34.

Patient on admission looks very ill, the face wearing a marked pallor, the mouth open & lips covered with sores, the head well extended and the child breathing rapidly and heavily, shewing marked laryngeal obstruction.

Retraction of the lower intercostal spaces and the sternum is most prominent on inspecting the abdomen.

Cervical glands on both sides are enlarged, but from their hard consistency appear to be chronically so.

Tongue moist and black on the dorsum evidently from the use of iron prior to admission. Very little is seen at the back of the throat.

There is slight faucial congestion, and both tonsils have a punched-out character with greyish white deposit lying in the crevices so formed. Uvula and other faucial parts are clean.

Pulse is rapid and easily compressible. Auscultation of the lungs is unsatisfactory.

owing to the laryngeal noise, from from it is learned, that the R. M. in the right lung is well nigh absent, while down the left axillary border fine mucocrepitant rales are heard.

2 a. m. 20 ccs. Antitoxin injected into the cellular tissue of the abdominal wall, 10 ccs. at two distinct points.

The usual local swellings on the abdominal surface occurred, but disappeared within twenty minutes.

Treatment adopted from the onset of the case was:

Throat & chest poultices — two hourly.

Steam inhalations (with 3j Tinct. Benzoin. Co. added) — two hourly.

Swabbing the throat with Boroglycerid every 2 hours.

Brandy ʒi every hour.

ward mixture (see page 3) every 2 hours.

Notes after the Injection.

3 a. m.	Temp.	98.4° F	Pulse	130	Resp.	36
5 "	"	98.4°	"	116	"	36.
7 "	"	98.8°	"	136	"	40
9 "	"	99.4°	"	132	"	48.

Patient slept at intervals, but on the whole was restless. The breathing within two hours of the inoculation became less noisy altho' as hurried, but the cough continued as croupy. No membranes expelled. Has taken nourishment badly, altho' there is no apparent difficulty in swallowing. The usual blush observed over the site of the

injections, but not any flushing.

11 am. Temp. 100.4° F. Pulse 120. Resp. 48.

There seems less obstruction to the breathing, but the pulse is of a poor character.

There is no alteration in the throat appearance, and the pulmonary symptoms are not in any way lessened.

Retraction as before.

1 P.M. Temp. 100.2° F. Pulse 100 Resp. 38

3 " " 100.2° " 116. " 44.

5 " " 100.4° " 100 " 40

7 " " 99.6° " 108 " 52

9 " " 100.4° " 120 " 44.

Has had several short snatches of sleep during the day but does not seem refreshed from them. Taking nourishment well, in fact rather greedily.

Breathing still noisy. No redness over abdomen now. Pulse improved.

11 P.M. Temp. 100.7° F. Pulse 119 Resp. 40.

Jan 2

1 am " 100° " 130 " 46

3 " " 100.6° " 134 " 44

5 " " 101.4° " 138. " 44

7 " " 101.2° " 124 " 38

9 " " 102.8° " 112. " 56.

The child, according to the night nurse's report, has had a good night, sleeping quietly at intervals, and the breathing became less noisy after 2 am. Pulse fairly strong. Taking nourishment well. Coughing occasionally but not croupy. The appearance of the patient is much improved. The

respirations being only slightly noisy, although not markedly reduced in number.

More air is entering the lungs, as evidenced by the presence of numerous moist crackling râles at both bases. Throat conditions unaltered. Glandular swelling less. Retraction much reduced.

11 a.m.	Temp. 101.2° F.	Pulse 118	Resp. 46
1 P.M.	" 100.2°	" 128	" 48
3 "	" 98°	" 116	" 38
5 "	" 100.4°	" 130	" 34
7 "	" 98.2°	" 116	" 36
9 "	" 97.4°	" 120	" 29

The breathing is not nearly so much laryngeal in character. Is very cross. Has been wishing to "sit up" in bed. No flushings. No abdominal tenderness. Hasn't slept much today.

11 P.M. Temp. 99° F. Pulse 100. Resp. 29.

1 a.m.	" 99°	" 109	" 34
3 "	" 98.6°	" 104	" 26
5 "	" 98.4°	" 104	" 26
7 "	" 98.4°	" 130	" 22
9 "	" 98.2°	" 100	" 26
11 "	" 98.6°	" 102	" 34

The night nurse reports that patient slept well all night having had to be awakened for nourishment. Breathing now is almost inaudible, & there is occasionally a croupy cough. The fauces are quite free from deposit & each tonsil is slightly punched out. Retraction very slight.

Jan 3rd

The lungs are free from râle, and the A. M. normal.

(This case is one which gave little hope of a good result, so grave was the child's condition on admission).

3 P. M. Temp. 99.6° Pulse 102 Resp. 34

7 " " 99.2° " 104 " 32.

Passed a very good day, sleeping at intervals & taking nourishment rather greedily. Not any membrane seen in the throat.

11 P. M. Temp. 97.8° Pulse 98 Resp. 24

3 am " 98° " 99 " 24

7 " " 97.6° " 100 " 19.

Patient, after resting well during the night, is lying quietly, breathing regularly and inaudibly & presents a good colour of face & lips. Lungs still free from râle. No retraction. No flushings have been observed anywhere unless over the site of injection. Throat clear.

11 am Temp. 98° Pulse 104 Resp. 24

3 P. M. " 98.4° " 112 " 28

7 " " 98.6° " 116 " 34.

Patient has slept a considerable part of the day, but towards evening became rather lively. The breathing is quiet, but the cough is at times still croupy.

11 P. M. Temp. 98° F. Pulse 99 Resp. 22.

3 am " 97° " 100 " 24

7 " " 97.4° " 99 " 20

11 " " 99° " 116 " 28.

Jan 4th

Jan 5th

Slept well all night and coughed very little. Looking brighter. Pulse regular no retraction. Breathing inaudible.

3 P. M. Temp. 99° F. Pulse 120 Resp. 24
 7 " " 98.4 " 110 " 24.
 11 " " 98.4 " 94 " 24.

Had a quiet day. Taking large quantities of nourishment

Jan 6th

3 am. Temp. 98.2° Pulse 90 Resp. 22.
 7 " " 98° " 88 " 20.
 11 " " 98.4° " 104. " 20.

Still coughing occasionally, but the croupy character is gone. The urine, which was obtained today, is free from albumen. No flushings seen yet. Breathing quiet and regular. Sitting up in bed.

3 P. M. Temp. 98° F. Pulse 110 Resp. 20
 7 " " 97.8° " 100 " 24.

This child has evidently quite got over the immediate dangers, and is cheerfully sitting up in bed enjoying her toys. She looks very well excepting for the pallor of the face and the occasional croupy cough.

11 P. M. Temp. 98.6° F. Pulse 100 Resp. 22.

Jan 7th

7 am. " 97.6° " 100 " 20.

Patient passed a good night. The lungs on examination seem in perfect condition. The throat is clear. Sleeping well.

7 P. M. Temp. 98.4° Pulse 96 Resp. 24.

Jan 12th

The pulse, respirations and temperatures

have been normal, & the child progressing satisfactorily until today, when for the first time since admission a distinct trace of albumen is observed in the urine, viz., the 25th day of illness and the 14th of admission.

Jan'y 16th The urine is today free from albumen. No alteration in the temperature has occurred. The cough has entirely gone, & the patient generally, is doing very well.

Jan'y 17th Got up out of bed today.
Convalescence uninterrupted.
No complications of any kind.

Feb'y 1st
Dismissed well.

Case IV.History of Case previous to Inoculation.

H. H. aet. 3 yrs., weight $19\frac{1}{4}$ lbs. was admitted to Hospital on January 2nd 1895 at 12.30 P.M. with a history of an illness commencing 4 days previously with croupy cough. This having become more aggravated.

There were no other symptoms noticed by the parents. Temperature on admission was $100.6^{\circ} F$. Pulse 130. Resp. 44.

Patient is a well developed child with rather a pale face, but lying quietly with the head extended, and breathing hurriedly and noisily. The colour of lips is very good considering the difficulty in aeration. Pulse altho' rapid, is of fair tension but rather wiry & perfectly regular.

Retraction of the abdomen and intercostal spaces generally is marked. There is a goodly quantity of air entering the lungs, the R.M. being somewhat hard but not replaced by any rale.

Tongue thickly coated but moist. Tonsils are slightly enlarged and congested, the uvula, soft palate and posterior pharyngeal wall being unduly reddened also.

No membrane or deposit of any kind seen in the faucial parts, but from the character of the respirations there is evidently considerable laryngeal obstruction. Heart normal.

7 P.M. Loes. of Antitoxin injected into the cellular tissue of the abdominal wall, there being a superficial vein opened into in the process, as evidenced by the slight venous haemorrhage which took place after the withdrawal of the needle.

Treatment adopted from the outset of the Case was—
 Maw's steam inhaler two hourly.
 Throat poultice hourly.
 Brandy 3i hourly.
 Ward mixture two hourly.

Notes after the Injections.

7 P.M. Temp. 100.4° F. Pulse 128 Resp. 44

9 " " 101° " 126 " 44.

Fell into a sound sleep immediately after the injection & has remained so since.

11 P.M. Temp. 100.8° Pulse 126. Resp. 48.

1 a.m. " 100° " 126 " 40

3 " " 99.8° " 120 " 38

5 " " 99° " 114 " 38.

7 " " 98.8° " 110 " 29

9 " " 99.2° " 110. " 30.

Patient continued to sleep during the early part of the night, but after that only at intervals. After midnight the breathing ^{was} less hurried and the noisy character much abated. The cough, too, as the night wore on was less frequent & not just croupy. She seemed to swallow without any difficulty.

July 3rd

no flushings observed. no membrane expelled. Perpiring freely.

As seen this morning there is a noted improvement. The respirations are still audible six or eight yards away, but last night they could be heard at the other end of the ward. Still a short croupy cough heard. Colour of the face, too, is better. Throat is still free from deposit, and the inflammation there has somewhat subsided. Retraction lessened. Cervical enlargement — as on admission — is confined to one gland. Auscultation shews that the air is entering both lungs better than yesterday, the R. M. however, being replaced at the bases by a dry crackling rale occasionally. Sibilant rhonchi are audible in front at either side. Slight tenderness over the area injected. Pulse continues to be of a fair quality. No urine obtained since admission.

11 am.	Temp. 99° F.	Pulse 118	Resp. 34
1 P. M.	100	104	36.
3 "	100.4	108	32.
5 "	98.2	130	30
7 "	99.6	128	40.
9 "	100	140	38
" "	98.6	120	30.

Patient has been restless during the early part of the day, but slept in the latter part. Respirations are still noisy and laryngeal in character. Retraction

is still well defined altho' nothing like so bad as on admission.

12 midnight. 10 ccs. Antitoxin injected into the cellular tissue of the abdomen.

Jan 24th

1 am.	Temp. 98.6 °F.	Pulse 120	Resp. 38
3 "	" 98.6 °	" 130	" 40.
5 "	" 98°	" 128	" 36
7 "	" 98.8°	" 130	" 48
9 "	" 98.4°	" 127.	" 36.

After the inoculation the child slept well, being rather cross when awakened for nourishment. The breathing this morning is distinctly audible at the bedside but not so, many yards from it. Has a short croupy cough — infrequent however — and the retraction is still distinct. No membranes coughed up at any time — none ^{seen} on the throat. The R. M. is harsh at the base, but elsewhere the lungs appear normal.

No flushings observed at any time. No urine obtained since admission.

11 am.	Temp. 98.2 °F.	Pulse 120	Resp. 44
1 P. M.	" 100.4°	" 128	" 40
3 "	" 99.8°	" 132	" 40
5 "	" 99.4°	" 120	" 36.
7 "	" 98.2°	" 140.	" 28.

Has slept for the most part of the day and had to be awakened for nourishment. Was sick and vomited once after using the ~~mountain~~ ^{mountain} ~~substance~~ ^{substance}. The face flushed distinctly on two occasions

Today, both times the child being fast asleep. The skin is acting freely. Swallowing better. No membrane coughed, and the matter which was vomited consisted of curdled milk only, no membrane being found in it. Breathing heavily but almost inaudibly. Cough rather croupy at times.

9 P. M. Temp. 98.8° Pulse 136 Resp. 32
 " " " 98.6° " 115 " 34

Jan 5th

1 A.M.	98.8°	100	30
3 "	98.4	104	32
5 "	98°	100	32
7 "	97.6°	100	28
9 "	98.4°	132	32
11 "	98.4°	120.	28.

Patient has passed a good night, sleeping well, breathing quietly and regularly and coughing only occasionally — that being however of a distinctly croupy character. Taking large quantities of nourishment — in fact is just rather greedy, so much so, as to produce vomiting. The general appearance is improved and the breathing is inaudible. The percussion note at both bases lacks its wonted resonant quality, and numerous coarse mucocrepitant râles are heard there. In front of the chest the R. M. is loud but no râle is made out. No more flushing. The urine was obtained today

is perfectly free from albumen.

3 P. M. Temp. 99.2° Pulse 132 Resp. 32.

7 " " 99° " 100 " 28.

11 " " 98.6° " 100 " 28.

Very cross today. Inclined to sleep at intervals. No abdominal tenderness.

wishing to be allowed to sit up in bed.

Jan 6th

3 A.M. Temp. 98.2° Pulse 98 Resp. 26.

7 " " 98.6° " 99 " 28.

11 " " 98.6° " 124 " 32.

Slept throughout most of the night. Is very ill. Temp. improved this morning and accordingly auscultation is performed with some degree of difficulty.

By the application of linseed poultices 2 hourly to the chest, however, the pulmonary condition has improved, sonorous râles having replaced the muc crepitant râles heard yesterday at the bases of both lungs. The respirations are quiet and unembarrassed.

3 P. M. Temp. 98° Pulse 127 Resp. 32.

7 " " 98.8° " 138. " 38.

Was sitting up in bed for some hours today. Did not sleep any.

11 P. M. Temp. 97.6° Pulse 108 Resp. 30

Jan 7th

3 A.M. " 97.6° " 102 " 26

7 " " 97.2° " 100 " 24.

The R. M. now is only replaced occasionally by a sonorous râle and the

cough has greatly lessened. Tonsils and uvula are unusually red. Urine free from albumen — as it has been all along.

11 am. Temp. 99° F. Pulse 120 Resp. 32.

3 P. M. " 99.2° " 132. " 38.

7 " " 98.6° " 132. " 32.

Sitting up in bed most of the day. Seems very well.

11 P. M. Temp. 98.6° F. Pulse 100 Resp. 28.

July 8th

3 am. " 98.4° " 106 " 20

7 " " 98.4° " 100 " 20.

Slept well. The croupy cough is still to some extent present.

7 Am. Temp. 98.8° Pulse 116 Resp. 32.

Coughed very little.

July 9th

7 am. Temp. 98.2° F. Pulse 102 Resp. 20

7 P. M. " 99° " 108. " 32.

July 11th

Since last note the temperatures have been normal. The lungs free from râles, the urine clear and the patient gradually improving in health. Tonight,

however, the face is flushed, the tongue is slightly furred and there have been during the day 4 loose motions. The following has been the nurse's report.

7 P. M. Temp. 102.6° F. Pulse 124 Resp. 36.

July 18th

The diarrhoea lasted for 3 days, but has now stopped, the treatment being chiefly dietetic, combined with the exhibition of the following:—

℞

Pulv. Oculas Aromat. grs 10.
 Sodae Bicarb. grs 3
 Sodae Benzoi. grs 2.

M.

℞ Fiat pulv. Mille Tales viij.
 Sig One after each loose motion

Stew.

Jan'y 29th The temperatures have been normal since the last note and there has been an occasional loose motion. Patient got out of bed today for the first time.

Feb'y 3rd 7 P.M. Temp. 103°F. Pulse 116. Resp. 42
 " 4th 7 am " 102.2° " 128 " 32.
 7 P.M. " 102° " 128 " 32

Not any cause can be assigned for the rise in the temperature. The bowels are quite normal and the chest reveals nothing abnormal to the stethoscope.

Feb'y 10th The temperature became normal on the evening of the 6th Feb'y, and everything doing well, patient was today allowed out of bed, having been put back to bed on the elevation of the temperature.

Feb'y 18th No complications having arisen, and patient being restored to her usual condition, was

Dismissed well.

Case VHistory of the Case previous to Inoculation.

S. M. aet. 4 yrs., weight 28 $\frac{1}{4}$ lbs. was admitted to Hospital on January 5th 1895, with a history of an illness of two days' duration of a croupy cough and difficulty in swallowing. Four weeks previously patient has been ill with measles, one brother having died on Dec. 26th 1894 from "congestion of the lungs" and another on January 24th of "Croup."

The temp. on admission was 100.4[°]F. The pulse 132, and the respirations 32.

Patient wears an anxious expression, the face being very pallid altho' the lips present a healthy colour. The respirations are hurried and markedly embarrassed, the mouth being held wide open, and the alae nasi dilating.

A short croupy cough intervenes occasionally. Pulse is full, rapid, and of high tension. The skin around the neck is red & inflamed, evidently from excessive poulticing prior to admission.

Retraction of the lower intercostal spaces distinct but not marked.

Auscultation shows the R. M. is feeble over the front of the chest, and also at the left base, but at the right base the percussion note is somewhat dull, & the R. M. is loud & accompanied occasionally by a dry crackling râle.

Tongue moist & furred. Tonsils,

uvula & soft palate are congested, but this not to any great extent, & on the inner surface of either gland is a small patch of membrane. That on the left tonsil is removed for examination, leaving behind a raw bleeding surface. There is also a small patch situated on the posterior pharyngeal wall. Cervical glands enlarged on either side.

4 P.M. 20 ccs. of Antitoxin injected into the cellular tissue of the abdominal wall at two distinct points.

Treatment from the outset of the Case was:—
 Boracic acid spray — two hourly
 Teaspoonful Brandy — hourly.
 Steam Inhalation — two hourly.
 Ward mixture — every two hours.

Notes after Injection.

6 P.M. Temp. 99°F. Pulse 136. Resp. 36.

Sleeping at this period, having kept awake for fully an hour after the injection.

6:40 P.M. Sick & vomiting — the vomited matter (consisting of milk darkened with the iron in the tonic) being examined negatively for membrane. Face becoming pallid, but the lips retaining their good colour.

8 P.M. Temp. 98.4°F. Pulse 140 Resp. 40.

Condition becoming more grave, the breathing being more rapid and much more obstructive in character. The lower part of the chest is being sucked

in at each inspiration to an excessive degree. Pulse irregular.

10 P.M. Patient is evidently becoming the longer the worse, cyanosis of the lips, and to a slight degree of the face being noted within the past hour.

Tracheotomy performed, no chloroform being used, but the patient died very shortly after the trachea was opened into.

Post-mortem Examination made Jan 6th 1895

Performed by the writer.

Report:— The body is well nourished and shows on the neck the wound for Tracheotomy. The skin entered by the needle during the injection of the Antitoxin is perfectly normal in appearance beyond showing two small punctures. The cellular tissue in the neighbourhood is congested.

Thorax. Pericardium contains about a drachm of serous fluid.

Heart appears healthy unless for the muscle being pale. weight $2\frac{1}{4}$ oz.

Lungs:— No adhesions on removing them, and no fluid in either pleural cavity. The left weighs 4 oz. On incising it, bubbles of mucus exude, but on following up the bronchus and bronchides these seem reddened, and the mucous membrane swollen. The right weighs $4\frac{1}{2}$ oz. and presents similar characters to the left with the addition that the

lower lobe is much congested.

abdomen:— The liver is of normal appearance externally & weighs 21 g. In section it is found that the centres of the hepatic lobules are congested. The spleen is quite normal & weighs $1\frac{1}{2}$ g. Both kidneys appear healthy, each weighing $1\frac{3}{4}$ g. The intestines contain solid fecal matter in many places but the coats seem healthy.

Throat:— The tongue with the faucial attachments was removed attached to the larynx & trachea. The tracheotomy wound was found immediately inferior to the cricoid cartilage and the incision was extended up & down. The entire mucous membrane was reddened, and one patch of membrane only found behind the right tonsil. There was oedema of the epiglottis.

Bacteriological diagnosis:—

Membrane from this case was sent to the British Institute of Preventative Medicine and report made that the Bacillus diphtheriae has been isolated and the case therefore one of genuine diphtheria.

Case VI.History of the Case previous to Inoculation.

W. W. S. S. act. 2 yrs., weight 24 lbs. was admitted to Hospital on July 6th 1895 at 12.20. P.M. with a history of an illness commencing 5 days previously with sore throat and croupy cough, these symptoms generally becoming worse. The temp. on admission was 99.4 °F, the pulse 132, and respirations 38.

Patient looks extremely ill indeed, the face being very pallid. The mouth kept wide open, and the efforts at breathing very violent. The alæ nasi are acting vigorously.

Respirations are accompanied by a crowing sound, and occasionally a short cough. Retraction of the entire abdomen, with the lower circle of the chest, as also the supra- and infra-clavicular spaces extremely well marked.

Tongue is pale and slightly coated with a whitish fur. Tonsils enlarged and congested, but free from any deposit. There is a small patch of membrane on the posterior pharyngeal wall. Uvula & soft palate are reddened. Cervical glands are enlarged, but evidently chronically so. Auscultation shows the R.M. to be harsh, and at the left base accompanied by a crepitant râle.

1 P.M. 2 cc's. Anthrax injected into the cellular tissue of the abdominal wall, two situations being chosen. The usual local swelling occurred for a few minutes.

Treatment adopted from the outset of the case was:-

Throat poultices	hourly.
Boracic acid spray	2 hourly.
Brandy $\mathfrak{z}\mathfrak{i}$	hourly.
Ward's mixture (see page 3).	2 hourly.

Notes after the Injection.

1.30 P.M. Temp. 99.4° F. Pulse 132 Resp. 38

3 " " 100° " " 130 " 50.

4 P.M. Patient is much worse, The respirations besides being more rapid are greatly embarrassed. Cyanosis commencing on the lips. There is not any change in the facial appearances. Retraction is greater.

5 P.M. Temp. 101.2° F. Pulse 146 Resp. 50.

7 " " 101.6° " " 144 " 52.

9 " " 100.6° " " 132. " 40.

Not any change for the better. Pulse is very poor.

9.30 P.M. 10ccs. Antitoxin injected. Was restless after midnight, the cough being croupy, but infrequent. Swallowing well.

11 P.M. Temp. 101° F. Pulse 130. Resp. 34.

January 7th

1 Am. " 100.6° " " 134 " 38.

1.30 " The respirations are not just so noisy, and the retraction is decidedly less.

2.30 am. Patient is sleeping, and the efforts at respiration are less pronounced. Pulse is small, frequent, & rather soft.

Lips have assumed a fairly good colour now, altho' the face is still pallid.

3 am. Temp. 99.6° F. Pulse 128 Resp. 30

5 " " 100.2° " " 120 " 28.

7 am. Temp. 99.2° F. Pulse 118 Resp. 30
 9 " " 99.6 " 128 " 36
 11 " " 99.8 " 136. " 34.

There is a great improvement noted this morning. Patient slept during the greater part of the night, having to be awakened for nourishment. The respirations are now audible only at the bed side, while yesterday on admission (24 hours ago) they were loud & crowing & accompanied by a slight crowing cough which has since gone. The retraction, too, is practically nil. The pulse has improved. Condition of chest is unaltered. Throat is red & congested, but there is no membrane visible. Cervical glands are not any more swollen, but decidedly not any less so. Slight tenderness over the abdomen at the site of injection. Urine free from the presence of albumen.

1 P. M. Temp. 99.4° F. Pulse 124 Resp. 32
 3 " " 100 " 132 " 48
 5 " " 99.6 " 120 " 44
 7 " " 99.6 " 110 " 40
 9 " " 99.4 " 120 " 38.

Has passed a good day, sleeping at intervals altho' pretty cross. The cough is very little now & the "croupy" element has perfectly gone. Taking large quantities of nourishment. Pulse regular.

11 P. M. Temp. 98.4° F. Pulse 102. Resp. 26.

3 am. Temp. 98.4° F. Pulse 100 Resp. 22

7 " " 97° " 100 " 26.

Slept well during the night, the breathing being quiet & no cough present. Still pale but very much improved in colour. Amusing himself with his toys today. Urine free from albumen.

11 am. Temp. 98.5° F. Pulse 120 Resp. 36

3 P. M. " 99° " 130 " 34

7 " " 99.8° " 132. " 32.

Not anything of note has occurred. Has quite a good day.

11 P. M. Temp. 100.6° F. Pulse 140 Resp. 28.

Jan 9th

3 am. " 100.2° " 144 " 30

7 " " 100° " 150 " 30.

The cough is more frequent today, but there is nothing pulmonary to account for this. Fauces free from deposit.

3 P. M. Temp. 99° F. Pulse 120 Resp. 28.

7 " " 97.6° " 126 " 40

11 " " 99.8° " 130. " 36.

Has passed a good day.

Jan 10th

3 am. Temp. 99° F. Pulse 130 Resp. 36.

7 " " 99° " 94 " 25

Looking well this morning altho he is still very cross. The respirations continue quiet and natural. Slept well.

11 am. Temp. 99.4° F. Pulse 108 Resp. 32

3 P. M. " 99.2° " 120 " 30

7 " " 98.6° " 108 " 26.

Progressing favourably.

11 P. M. Temp. 98.6° Pulse 104 Resp. 30.

Jan 11th

3 am	"	98°	"	100	"	26
7 "	"	98°	"	102	"	26
11 "	"	98.8°	"	120	"	24.

Had a favourable night. The child's general condition is improving. Lungs free from râle. Urine free from albumen.

At 7 am Temp. 98.9° Pulse 102. Resp. 28.

Jan 12th

7 am	"	98°	"	112	"	24
7 P. M.	"	98.8°	"	116	"	26.

Jan 13th

7 am	"	98.4°	"	104	"	22
7 P. M.	"	98.8°	"	100	"	28

Jan 14th

7 am	"	99°	"	90	"	28
7 P. M.	"	99.2°	"	126	"	44.

Urticaria present over trunk and arms.

Jan 15th

7 am	Temp.	98.4°	Pulse	104	Resp.	44.
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The urticaria is gone today.

7 P. M.	Temp.	98.4°	Pulse	100	"	32.
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Jan 16th

7 am	"	98°	"	112	"	32.
7 P. M.	"	99.4°	"	98	"	30

Jan 17th

7 am	"	99.2°	"	112.	"	24
7 P. M.	"	101.8°	"	128	"	30

Not anything to account for the rise in the temperature.

Jan 18th

7 am	Temp.	100° F.	Pulse	124	Resp.	28
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7 P. M.	"	104.2°	"	140	"	40
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Again the heart, lungs and abdomen have been examined & no obvious lesions found. The urine examined negatively for albumen.

Jan 19th 7 am. Temp. 101° F. Pulse 118 Resp. 28
7 P.M. " 104.8° " 140 " 52

The child today points to the occipital region, evidently indicating pain there, but percussion to a moderate degree does not elicit anything further.

Jan 20th 7 am. Temp. 102.4° F. Pulse 136 Resp. 48
7 P.M. " 104.8° " 156 " 52

Jan 21st 7 am. " 102° " 144 " 54
7 P.M. " 102.4° " 136 " 44.

Still no accountable cause for the pyrexia. Urine free from albumen.

Jan 27th The temperatures are normal now, and the child taking food well. He has, all along, rested satisfactorily at nights.

Feb 7st Got out of bed today for the first time.

Feb 15th No complications of any kind having arisen. Patient was today dismissed well.



Case VIIHistory of the Case previous to Inoculation.

J. M. L. aet 3 yrs., weight 28 lbs. was admitted to Hospital on July. 10th 1895 at 11.30 a.m., with a history of an illness commencing 4 days previously with a croupy cough & sore throat. There was no apparent difficulty in swallowing.

The temperature on admission was 98.2⁷. The pulse 124, and The respirations 20.

Patient does not look very ill. He is rather a fat little boy, with a good colour of face and lips.

Pulse at this accelerated is of good tension & perfectly regular in rhythm.

Respirations are accompanied with the least possible noise indicative of laryngeal obstruction.

Auscultation shows the presence of numerous sonorous and sibilant râles on either side of the chest, both in front and behind.

Heart sound pure.

The neck and upper part of the chest are reddened in front, evidently from excessive poulticing.

Tongue moist & coated with a white fur. Tonsils are enlarged and along with the uvula & soft palate are rather inflamed.

A small patch of membrane, pale in colour, is situated in a crevice in either tonsil. There is not any elsewhere.

The cervical glands are enlarged, but hard, this being apparently a chronic condition.
 4th 2 P.M. 2 ccs. of Antitoxin injected into the cellular tissue of the abdominal wall.

Treatment adopted from admission was:—

Boric acid spray — 2 hourly.

Inhalation of steam — 2 hourly.

Ward mixture (see page 3) — 2 hourly.

Notes after Injection.

6 P.M. Temp. 98.8° F. Pulse 128 Resp. 28

8 " " 99° " 120 " 38.

Has been lying quiet, but not sleeping until after 6 o'clock. Occasionally coughing — croupy in character.

Localised redness and tenderness over the injected area, altho' the swelling disappeared within half an hour.

10 P.M. Temp 99.8° F. Pulse 120 Resp. 38

12 midnight " 99.6° " 120 " 36.

July 11th

9 am. Temp. 99° " 120 " 24

4 " " 98.8° " 120 " 22.

6 " " 99.2° " 122 " 20.

8 " " 99.4° " 134 " 26.

10 " " 98° " 124 " 20.

Slept well all night, having to be awakened to take nourishment of which he took large quantities. Swallowing without apparent difficulty.

Coughed frequently, and that of a croupy nature. Breathing quiet and regular. No membrane coughed up.

c

d

25

Colour of face remains good. A few sibilant râles are still heard at the front of the chest chiefly.

Fauces perhaps a trifle redder than yesterday & there is a small speck of membrane on either tonsil—perfectly white, with the margins slightly raised from the tissues beneath. The blush over the injected area is well marked, tenderness, too, being a prominent symptom.

12 noon.	Temp.	100° F.	Pulse	120	Resp.	28
2 P. M.	"	99°	"	132.	"	30
4 "	"	99.4°	"	130	"	22
6 "	"	99.4°	"	120	"	28
8 "	"	99.4°	"	128.	"	24.

Has not slept any during the day, but breathing quiet and unembarrassed. Taking nourishment and treatment well.

Slight cough, but the croupy element is gone.

10 P. M.	Temp.	99°	Pulse	100	Resp.	20.
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Jan 12th

9 am.	"	98°	"	100	"	20
11 "	"	98°	"	100	"	20
6 "	"	98°	"	100	"	20
8 "	"	98°	"	102.	"	20
10 "	"	97°	"	120.	"	22

Has slept well during the night; the breathing being perfectly natural. Lungs clear. Retaining his good colour of face. Marked tenderness & redness, and distinct induration of the skin over the site of inoculation. No coughing of any consequence now. Urine free from albumen.

as it has been all along. There is a fresh deposit of membrane over the posterior pharyngeal wall, and this of a pale colour, the surrounding tissues being much congested.

12 noon	Temp.	100.4° F.	Pulse	132.	Resp.	30
2 P.M.	"	99°	"	120	"	24
4 "	"	99.4°	"	116	"	24
6 "	"	99.6°	"	112	"	22.
8 "	"	98°	"	116	"	20.

Passed a good day. Did not sleep any.

10 P.M.	Temp.	97° F.	Pulse	100	Resp.	20
12 mid'nt.	"	97.2°	"	96	"	20.

Jan'y 13th

9 Am.	"	98°	"	90	"	18
11 "	"	98.4°	"	94	"	20
6 "	"	97.4°	"	99	"	20
8 "	"	96.4°	"	112	"	20
10 "	"	99°	"	112.	"	24.

Nothing unusual has transpired. Patient has slept well, and there has not been any coughing. The Throat is free from membrane. Urine does not show any trace of albumen.

12 noon.	Temp.	99.6° F.	Pulse	106	Resp.	24.
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As patient is progressing so satisfactorily, it is not considered necessary to take any more two hourly notes

6 P.M.	Temp.	98°	Pulse	100	Resp.	22.
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Jan'y 14th

6 Am.	"	98°	"	100	"	18.
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Good colour of face continues. The Throat is perfectly normal. Sleeping well.

July 15th 6 P. M. Temp. 97.4° Pulse 104 Resp. 24.

6 A.M. " 98.2° " 90 " 24.

Sitting up in bed today, and enjoying himself with his toys. Everything doing well.

6 P. M. Temp. 98.5° Pulse 108 Resp. 24

July 16th

6 A.M. " 99.2° " 96 " 20.

Got up out of bed today for the first time.

July 23rd

Convalescence has been uninterrupted
No flushings observed at any time.
No complications

Dismissed well.

Case VIII.History of the Case previous to Inoculation.

R. W. B. aet. 2 $\frac{1}{2}$ yrs., weight 25 $\frac{1}{4}$ lbs., was admitted to Hospital on July 10th 1895 at 3:20 a.m. with a history of an illness commencing 7 days previously. At that time she was "out of sorts," and 3 days later vomited, complaining of sore throat, this being accompanied with a croupy cough. The breathing became noisy, this feature becoming more marked as time advanced.

The Temp. on admission was 99° F., the pulse 114, and the respirations 22.

Patient looks pale and ill, lying in bed with the head somewhat extended, the mouth partially open, and breathing heavily and noisily.

The lips are of a fairly good colour.

Pulse is rapid and easily compressible. Slight retraction of the lower intercostal spaces & more especially, the inferior sternal region. A. M. very loud over the back of the chest and loud rhonchi are heard. Tongue is reddened, and covered with a thin whitish film. The tonsils are both enlarged and rather congested & on the surface of each is a small patch of whitish membrane. The uvula and soft palate, altho' taking part in the general faucial congestion are free from membrane. Cervical glands are large & hard.

4:45 P.M. Locos. antitoxin injected into the cellular tissue of the abdominal wall, the injection being done at two distinct points. The usual local swelling occurred and there was some trifling haemorrhage from one of the points of injection.

Treatment adopted from the outset of the Case was:

Stems Inhalation	-----	2 hourly.
Throat poultices	-----	hourly.
Boracic acid spray	-----	2 hourly
Brandy	3j	hourly.
ward mixture	-----	2 hourly.

Notes after the Injection.

6 P.M. Temp. 98.4° F Pulse 136 Resp. 24
8 " " 98.8° " 124 " 24

Patient fell into a quiet sleep within a few minutes after the inoculation, altho' the breathing is very loud and much embarrassed, there being an occasional short croupy cough.

The two little abdominal swellings formed after the injection are very slow in being absorbed in this case. Redness and tenderness marked over the localised area.

No urine has yet been obtained.

10 P.M. Temp. 98.8° F Pulse 130 Resp. 26.
12 mid'nt. " 99° " 130 " 26

Jan. 11TH

9 Am. " 98.4° " 122 " 18
4 " " 99° " 132 " 18
6 " " 99.2° " 130 " 19

8 a.m. Temp. 99.2° F. Pulse 118 Resp. 22.

10 " " 99° " 122 " 24.

During the first part of the night patient was restless & coughed frequently, but later she fell into a sound slumber from which she had to be awakened for nourishment. The breathing was much quieter and quite regular all night through. She still looks very ill, and altho' not restless, breathes with a marked laryngeal ring about it, and coughing (croupy) frequently. Disinclined to take any observations of her surroundings. Pulse quick and soft. Colour of lips good. Retraction of intercostal spaces not any worse. The lungs are decidedly more congested than yesterday, and there is present on the surface of either tonsil a small white patch of membrane, extended to the contiguous uvular surface on the left side. The localised abdominal blush is still present. Urine free from albumen.

12 noon. Temp. 99° F. Pulse 138. Resp. 32

2 P.M. " 99.2° " 140 " 20

4 " " 99° " 136. " 20

6 " " 98.6° " 128 " 24

8 " " 99° " 132. " 24.

Very much improved this evening. Has slept during the greater part of the day. The breathing is noisy at intervals and there is still a croupy cough. The laryngeal membrane is apparently

becoming detached, judging from the moist sound accompanying respiration. A second dose of antitoxin not considered necessary.

10 P.M. Temp. 99° F. Pulse 124 Resp. 18.

Jan 12th

9 am.	"	99.4°	"	100	"	20
11 "	"	99.6°	"	104	"	20
6 "	"	99.6°	"	100	"	20
8 "	"	99°	"	110	"	20

Passed a good night, sleeping for the most part. Breathing quiet and unembarrassed, altho' croupy cough still present. There are a few coarse mucous râles present at the base of the lungs. Marked tenderness at the area of circulation at the abdomen, a bluish being distinct there, also, ^{the skin} indurated.

The throat is still congested, but no membrane visible. No retraction.

Urin still free from the presence of albumen.

10 am. Temp. 99.8° Pulse 128 Resp. 28

12 noon. " 99.8° " 144 " 32

2 P.M. " 99.8° " 128. " 20

4 " " 98.4° " 132 " 20

6 " " 98.4° " 124 " 24

8 " " 98.2° " 124 " 18.

Croupy cough still present, but the breathing is regular. Taking large quantities of nourishment. Urin free from albumen.

10 P.M. Temp. 97° F. Pulse 100 Resp. 20

12 mid'nt " 97.2° " 120 " 18.

Jan 13th

2 am.	Temp.	98.2° F.	Pulse	120	Resp.	20
4 "	"	98	"	124	"	20
6 "	"	97.4°	"	104	"	18
8 "	"	98.4°	"	120.	"	24.

Passed a good night. Looking very well
This morning, the breathing being quiet
and regular. Still slight cough.

10 am.	Temp.	98.8° F.	Pulse	116	Resp.	20
12 noon.	"	97.2°	"	96.	"	28
2 P.M.	"	98.4°	"	108	"	24
4 "	"	98.2°	"	98.	"	20
6 "	"	97°	"	100	"	28
8 "	"	98.4°	"	99	"	20.
10.	"	98°	"	92.	"	18.

Not any cough all day. Doing well.
12 mid at Temp. 97° F. Pulse 96 Resp. 18.

July 14th

2 am.	"	97.2°	"	96.	"	16
4 "	"	97°	"	90	"	18
6 "	"	97.6°	"	92.	"	18
8 "	"	98.4°	"	104	"	20.
10 "	"	98°	"	100.	"	24.

The chest is free from rale. Throat clear.
6 P.M. Temp. 97.6° Pulse 106 Resp. 24.

July 15th

6 am.	"	97°	"	94	"	21.
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Sitting up in bed, and quite cheerful
This morning.

6 P.M.	Temp.	98.4°	Pulse	80	Resp.	28.
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July 16th

6 am.	"	97.6°	"	104	"	28
6 P.M.	"	98.6°	"	76	"	20.

July 17th

6 am. Temp. 98.6° Pulse 98 Resp. 20
 6 P. M. " 98.6° " 76. " 20.
 Got up out of bed today. Now the worse.

Jan 18th

6 am. Temp. 97.2° Pulse 92 Resp. 18
 6 P. M. " 97.2° " 72. " 16

Jan 19th

6 am. " 97° " 90 " 18
 6 P. M. " 98.6° " 84 " 18.

Jan 20th

The Temperature has continued normal since last note and the child is now well.

No complications of any kind.
 No flushings observed.

Dismissed well.

Case IX.History of the Case previous to Inoculation.

C. M. D. aet. 2 1/2 yrs., weight 22 lbs., was admitted to Hospital on July 14th 1895 at 9.45 P. M. with a history of sore throat commencing 4 days previously, and rapidly becoming worse.

The temperature on admission was 98.2 °F. The pulse 136, and the respirations 26.

The face is very pallid, altho' the colour of the lips is fairly good. Patient is restless in bed, breathing hurriedly & so noisily as to be easily heard at the other end of the ward. A little short-croupy cough is present now & again. Retraction of the lower sternal border and intercostal spaces, very pronounced.

Pulse rapid, but regular and of fairly good character. Tongue moist and black on the surface, evidently from the use of iron prior to admission.

The right tonsil is enlarged, and displays on its surface a thin whitish membrane. There is also a small patch seen on the posterior wall. Fauces not at all inflamed. R. M. markedly diminished over the entire pulmonary area, but no rale is heard. The cervical glands are not enlarged.
10.30 P. M. 2 ccs. antitoxin injected.

Treatment adopted from the outset was:—

Steam Inhalation — 2 hourly.
Throat poultices — hourly.

Boracic acid spray — 4 hourly
 Brandy 3j — hourly
 Ward mixture (see page 3) — 2 hourly.

Notes after the Injection.

12 midn. Temp. 98.2° F. Pulse 138 Resp. 32

July 15th

2 am.	"	99°	"	132	"	28
4 "	"	99.4°	"	140	"	28
6 "	"	99.8°	"	132	"	26
8 "	"	99.4°	"	136	"	24
10 "	"	98.8°	"	144	"	28

Half an hour after the inoculation patient fell into a good sound sleep, in which condition she remained almost throughout the entire night, having to be aroused periodically to take nourishment. The breathing too became less noisy, and the cough was trivial.

This morning there is no very evident change in the appearance. Patient is lying quiet in bed, with the head extended, and breathing very labouredly, altho from the moist character of the respirations there is evidently a loosening of the laryngeal membrane. There is not any alteration in the facial parts. No localised tenderness at the seat of the injection.

12 noon. 10 ccs. Antitoxin injected into the abdominal wall

12 noon.	Temp.	98.8° F.	Pulse	120	Resp.	24
2 P. M.	"	99.4°	"	130	"	24
4 "	"	99.2°	"	110	"	28
6 "	"	99.6°	"	144	"	28

8 P.M. Temp. 100.6° F. Pulse 148 Resp. 36.

Slept during the afternoon after the inoculation, until about 5 o'clock, when the respiratory difficulty became so aggravated that the question of Tracheotomy was considered. Vomited twice after the ward mixture and seemed relieved.

10 P.M. Temp. 100.4° F. Pulse 144 Resp. 28

12 mid'nt. " 100.6° " 154 " 28.

Jan. 16th

2 am. " 99.6° " 132 " 24.

4 " " 99.8° " 144 " 28

6 " " 99.4° " 132. " 28

8 " " 99.8° " 132. " 24.

The colour of the face and the character of the respirations are greatly changed for the better this morning, the latter being less noisy & less obstructive.

Retraction is much reduced.

The change in the character of the throat is very noted, the uvula & soft palate being extremely red — indeed more so than has been observed in previous antitoxin cases. There are still small patches of membrane scattered over both tonsils, & posterior pharyngeal wall.

Lungs are free from rales, but the R.M. is indistinct all over. No atteration in the glandular enlargement. The urine is free from albumen.

12 noon Temp. 101.2° F. Pulse 132 Resp. 28

2 P.M. " 99.2° " 140 " 18

4 " " 99.4° " 115 " 24.

6 P.M. Temp. 99.6° F. Pulse 120 Resp. 22.
 8 " " 99.6° " 120 " 32.

Has passed a good day, coughing little and breathing distinctly less laryngeal.

Redness over the site of the injection.

No membrane expelled.

10 P.M. Temp. 98.4° Pulse 120 Resp. 18
 12 mid'nt. " 98.8° " 124 " 24.

January 17th

2 am. " 98.6° " 120 " 24
 4 " " 98.8° " 124 " 30.
 6 " " 99° " 124 " 28
 8 " " 98.4° " 132. " 32.
 10 " " 98.8° " 128 " 28

Looking very well this morning. Slept on the whole well, altho' at times the cough was troublesome. The faucial parts are free of membrane now, but the redness continues. Taking nourishment well. Abdominal tenderness gone. Quality of pulse good. There is quite a change in the respiratory sounds, these now being heard only a few feet from the bedside.

12 noon. Temp. 98.6° F. Pulse 130 Resp. 28

2 P.M. " 98.6° " 120 " 20.

4 " " 99.2° " 124 " 20.

6 " " 99.2° " 120 " 24

8 " " 97.8° " 100 " 20.

10 " " 97.2° " 100 " 24.

Nothing unusual to note. Passed a good day. Enjoys the maw's & tubular.
 12 mid'nt Temp. 97.2° Pulse 104 Resp 25.

Jan. 18th " 6 am. Temp. 97.6° Pulse 108 Resp. 24
 4 " " 97.4° " 100 " 22.
 6 " " 97.6° " 104 " 24
 8 " " 97.4° " 102 " 23.
 10 " " 97.2° " 116. " 24.

The colour of the face is returning to normal now & patient is breathing quietly. & only an occasional cough is heard.

No mucus has been expelled. Tonsils this morning are covered with a whitish exudation. The congestion of the fauces continuing.

6 P.M. Temp. 97.2° F. Pulse 120 Resp. 24.

Jan 19th
 6 am. " 97° " 120 " 24
 6 P.M. " 98.4° " 108 " 28.

Jan 20th
 6 am. " 98.2° " 112 " 22
 6 P.M. " 97.2° " 100 " 20

Excepting for speaking huskily, patient seems very well now, breathing quietly & without apparent difficulty. The urine has been free from albumen all along. Throat perfectly clear.

Jan 21st
 6 am. Temp. 97.4° Pulse 112 Resp. 20
 6 P.M. " 97.2° " 118 " 28.

Jan 22nd
 6 am. " 97.6° " 100 " 20
 6 P.M. " 97.8° " 104 " 28.

Still speaks with a hoarse voice.

Jan 23rd
 6 am. Temp. 97.8° Pulse 108 Resp. 20.

C.P.M. Temp. 98.6° Pulse 108 Resp. 24

July 24th

6 am. " 97° " 108 " 24

C.P.M. " 98.2° " 92 " 24.

Urine continues free from albumen.

July 25th to July 28th

urticaria present. Temperature not
in any way disturbed. Progressing favourably.

July 29th

Allowed up today for the first time, the
temperatures having remained normal
since last noted.

July 31st

Not any complications.
Dismissed well.

Case XHistory of the Case previous to Inoculation.

W. M. D. aet. 4 yrs., weight 23½ lbs., was admitted to Hospital on Jan. 15th 1895, at 11.30 P. M. with a history of an illness commencing 5 days previously with sickness & vomiting, a croupy cough developing 3 days later.

No other symptoms noticed by parents. The temp. on admission was 98.4° F, The pulse 106 and the respirations 28.

Patient on admission is pale and ill looking but not apparently greatly distressed. He lies quiet in bed with the head drawn back and the mouth drawn ~~back~~, partially open breathing noisily, but this feature not being pronounced. Pulse regular & not easily obliterated. Retraction of the lower intercostal spaces is distinct but not marked.

Tongue moist and thickly covered with a whitish coating. Both Tonsils are much enlarged & stand out prominently and are congested, as also are the uvula & soft palate. Covering the right Tonsil is a patch of whitish membrane about the size of a large pea. This is easily removed with forceps, and leaves behind a raw bleeding surface.

Small patches of membrane are scattered over the posterior pharyngeal wall & left Tonsil respectively.

all over the front of the chest coarse mucous râles are heard, while behind at the right base similar features present themselves. At the left, however, the râles are distinctly sonorous in character. Cervical glands slightly enlarged.

1/2 fluid' of Lozes. Antitoxin injected underneath the skin of the anterior wall of the abdomen.

Treatment adopted from the outset of the case.

Boracic acid spray — 2 hourly.
 Inhalation of steam — hourly.
 Throat poultices — hourly.
 Brandy $\mathcal{Z}\mathcal{ij}$ — hourly.
 Ward mixture (See page 3) 2 hourly.

Notes after the Injection.

July 16th

2 am.	Temp.	98.6°	Pulse	112	Resp.	24
4 "	"	99.4	"	144	"	28
6 "	"	100°	"	142	"	28
8 "	"	100°	"	144	"	30.
10 "	"	99.6°	"	144	"	40.

After the inoculation patient fell into a sound sleeping remaining thus all night, having to be awakened at intervals for nourishment.

This morning he looks paler, and there is just a suspicion of commencing lividity. The respirations — which are pretty rapid — are hindered by much

laryngeal obstruction, and the intercostal retraction is greater. He is swallowing well & without apparent discomfort. The facial appearance is unchanged and the lungs present the same features to the stethoscope.

12 noon. 10 ccs. Antitoxin injected.

2 P.M. Temp. 99.2° F. Pulse 140 Resp. 40

4 " " 98. " " 144 " 32

Patient is rapidly becoming worse, there being marked pallor of the face with distinct lividity of the lips and cold clammy condition of the extremities.

Retraction very pronounced.

11.30 P.M. Tracheotomy performed. The high operation being chosen. Under the influence of chloroform the trachea was exposed, and on its being incised, with the aid of feathers and the efforts at expulsion, quite a quantity of flakes of membrane was removed from the trachea & bronchi. A no. 3 Fouli's tube was inserted, and within half an hour from the commencement of the operation the child had settled into quiet comfortable sleep.

6 P.M. Temp. 99.8° F. Pulse 104 Resp. 44

8 " " 101.6° " " 144 " 60.

Patient is very comfortable, the colour being well maintained and the pulse remaining steady altho' very soft.

10 P.M. Temp. 101.4° Pulse 134 Resp. 64.

12 mid' at Temp. 100.6° Pulse 128 Resp. 48.

July 17th

Jan.	"	100.4°	"	132.	"	50
4 "	"	100°	"	132.	"	46
6 "	"	100°	"	140	"	40
8 "	"	99.6°	"	138	"	44
10 "	"	100°	"	152.	"	60.

Looking very well. Has slept well during the night, only coughing about half a dozen times. Not much mucous discharge. Pulse of good quality comparatively. Taking large quantities of nourishment.

12 noon. Temp. 100.2° Pulse 144 Resp. 56.

2 P.M.	"	100.2°	"	144	"	56
4 "	"	100°	"	140	"	54
6 "	"	99.4°	"	144	"	40
8 "	"	100°	"	140	"	52.
10 "	"	102.2°	"	148	"	52.

Slept during the greater part of the day, the cough being not at all troublesome. Several good sized pieces of membrane expelled through the tube.

Rather restless since 5 P.M.

12 mid' at Temp. 101.8° Pulse 128 Resp. 50

July 18th

Jan.	Temp.	101° F.	Pulse	128	Resp.	48.
4 "	"	100.8°	"	124	"	46
6 "	"	101°	"	124	"	52.
8 "	"	99.2°	"	120	"	42.
10 "	"	99.8°	"	132	"	40.

Patient seems to enjoy the Siegle's Steam Spray immensely. Several shreds of membrane again expelled through

The tube, Breathing quietly. Swallowing without much difficulty.

12 noon.	Temp.	99.2° F.	Pulse	140	Resp.	44
2 P.M.	"	100.4°	"	140	"	36
4 "	"	101.6°	"	132	"	36.
6 "	"	101.6°	"	140	"	48
8 "	"	100.8°	"	144.	"	52.

The cough is not at all troublesome. Several pieces of membrane expelled. Urine shows presence of albumen distinctly.

10 P.M.	Temp.	101° F.	Pulse	134	Resp.	42.
12 mid'nt	"	100.6°	"	126	"	40.

Jan 19th

Jan.	"	99°	"	116	"	32.
4 "	"	99.4°	"	116	"	34.
6 "	"	99.2°	"	112.	"	34.
8 "	"	99°	"	112.	"	30
10 "	"	99.4°	"	120.	"	28.

Lying quite quietly, and breathing without obvious difficulty. Sleeping well & perspiring freely. No much cough. Only one piece of membrane expelled today. Lungs free from rale.

12 noon.	Temp.	99.6°	Pulse	132.	Resp.	32.
2 P.M.	"	100.2°	"	128	"	28.
4 "	"	99.6°	"	128.	"	36.
6 "	"	99.6°	"	128	"	32.
8 "	"	99.6°	"	124	"	36.

Had a good day, coughing little, and taking large quantities of nourishment. One small piece of membrane expelled. Distinct trace of albumen in the urine

10 P.M.	Temp.	99.6° F.	Pulse	110	Resp.	34.
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12 mid'at. Temp. 99° F. Pulse 104 Resp. 32.
 Jan 20th

2 a.m.	"	98°	"	108	"	30
4 "	"	98.8°	"	118	"	32.
6 "	"	99°	"	116	"	28.
8 "	"	98	"	112	"	26.
10 "	"	99.6°	"	124	"	36.

Slept well. No mucus expelled.
 Tracheotomy tube removed and the
 wound sutured. No great effort for
 the child to commence oral breathing.

12 noon. Temp. 99.8° F. Pulse 108 Resp. 24

2 P.M.	"	99.8°	"	120	"	28
4 "	"	99°	"	120	"	28.
6 "	"	100.6°	"	132.	"	24
8 "	"	101.8°	"	120	"	30
10 "	"	100.8°	"	116.	"	28.

Patient not any the worse for the
 removal of the tracheotomy tube.
 The urine is still albuminous

12 mid'at. Temp. 100.4° F. Pulse 110 Resp. 28.

Jan 21st

2 a.m.	"	99.2°	"	120	"	24
4 "	"	101.4°	"	124	"	28
6 "	"	101°	"	130	"	32.
8 "	"	100°	"	124	"	26
10 "	"	100.6°	"	128	"	24.

After a good night's sleep, patient is
 quite bright this morning. The cough
 altho' still present is not in any
 degree troublesome. No mucus
 coughed up since the removal of the
 tube urine free from albumen today.

Jan. 22nd 6 P.M. Temp. 102.4° F. Pulse 120 Resp. 32.

6 am. " 98.2° " 116 " 26

6 P.M. " 98.8° " 88 " 24.

Trace of albumen in the urine.

Jan. 23rd

6 am. Temp. 98.4° Pulse 118 Resp. 24

6 P.M. " 98.2° " 100 " 25.

Jan. 24th

6 am. " 97.4° " 112 " 28

6 P.M. " 98.2° " 124 " 24.

The coughing has now almost ceased.
Urine free from albumen today.

Feb. 2nd

Got up today for the first time.
Urine has been free from albumen since
Jan. 24th. Temperatures have been
normal since last note.

Feb. 18th

No complications.

Dismissed Well.

Bacteriological Examination.

A piece of the membrane was
forwarded to the British Institute of
Preventative Medicine and their
report showed the case to be one of
"Genuine Diphtheria."

Summary.

Case I.

The disease had too firm a hold on the patient in this case, before the Injection of Antitoxin was tried. Died 6 hours after the Injection and $97\frac{1}{2}$ hrs. after admission.

Case II.

Within 24 hrs. the membrane was lessened in extent, and the face not so red.

The temperature was not materially altered after the injection, being normal on admission.

Face flushed on the 2nd day.

Slight bronchitis 6 days after the injection but at this time the throat was free from membrane.

Convalescence otherwise good, was dismissed well 34 days after admission.

Albuminuria from 3rd until the 6th day.

Case III.

Breathing less noisy 2 hrs. after the commencement of the treatment.

Temperature began to rise (from 98 to 100.4) 12 hrs. after the injection & remained up for 2 days.

Albuminuria from 12th till 16th day.

Case IV.

Respirations much quieter and more air entering the lungs 12 hrs. after the injection.

Slept soundly for some hours after each of the inoculations.

Face flushed twice during sleep on the 3rd day.

Broncho-pneumonia 3rd till 10th day.

Diarrhoea from end of the 2nd week for a few days. The Temp. reaching 102.6° on the evening of the 12th day.

Temp. rose for 3 or 4 days a month after the treatment, & after patient was out of bed.

Urine free from albumen.

Case v.

Right basilar pneumonia from admission. Remained awake for an hour after the inoculation. No urine obtained.

Laryngeal stenosis became rapidly worse, patient dying 7 hours after admission, and 6 hours after inoculation.

Tracheotomy performed, but death took place from Cardiac Syncope before the admission of air to the lungs was accomplished.

Case vi.

Left basilar pneumonia from admission. Laryngeal symptoms more aggravated for 12 hrs. after the injection when patient seemed to improve.

Urticaria present for 1 day, on the 9th day.

From the 13th day the Temp. unaccountably rose.

Urine free from albumen all through.

Case vii.

Some degree of bronchitis on admission.

Fresh deposit of membrane on the tonsils,
on the 2nd day after admission.
No albuminuria.

Case viij.

Slept quietly after the injection, and
this too after being restless.

Abdominal blush remained for 2
days after the injection.

Urine free from albumen.

Case ix.

Fell asleep half an hour after the
injection and remained so all night.
Urticaria 12th day.

No albuminuria

Case x.

Bronchitis on admission.

Slept well after the inoculation.

Tracheotomy 17 hrs. after admission
and 16½ hrs. after the inoculation.

Albuminuria 3rd day, & at intervals
afterwards.

N. B. The number of the days above
mentioned, refers in all cases, to the
number of days after the primary
inoculation.

No.	Name.	Age. years.	Weight lbs.	Day of illness or admission	Temp. and	Temp. and	Temp. and	Complications.	Result.
					Respirations. at Inoculation	Respirations. abt. 5 hrs. after Inoculation.	Respirations. 12 hrs. after Inoculation.		
1.	E. D.	4½	—	6 th	Temp. = 100 Resp. = 48.	Temp. = 100 Resp. = 52.	Died within 12 hrs.	Cardiac Syncope.	Died.
2.	A. M. F.	2.	27½	6 th	Temp. = 98.2 Resp. = 26.	Temp. = 99.2 Resp. = 24.	Temp. = 99 Resp. = 26.	Bronchitis. Albuminuria on the 3 rd day & at intervals.	Well.
3.	M. S.	1½	21.	7 th	T. = 99.4 R. = 36.	T. = 98.8 R. = 40.	T. = 100.2 R. = 44.	Albuminuria 12 th till 16 th day.	Well.
4.	R. W.	3.	19½	5 th	T. = 100.4 R. = 44.	T. = 100 R. = 40.	T. = 99.8 R. = 29.	Broncho-pneumonia from 3 rd till 10 th day. Diarrhoea 12 th till 16 th day. Pyrexia 32 nd till 36 th .	Well.
5.	S. M. C.	4.	28½	3 rd	T. = 99 R. = 36.	T. = 99.4 R. = 40.	Died within 12 hrs.	Pneumonia Cardiac Syncope.	Died.
6.	W. M. F.	2	24	6 th	T. = 99.4 R. = 38.	T. = 101.6 R. = 52.	T. = 100.6 R. = 38.	Urticaria on 9 th day. Pyrexia from 13 th till 19 th .	Well.
7.	L. M. H.	3	28.	5 th	T. = 98.8 R. = 28.	T. = 99 R. = 38.	T. = 99.8 R. = 22.	None.	Well.
8.	R. M. B.	2½	28½	8 th	T. = 98.4 R. = 24.	T. = 98.8 R. = 26.	T. = 99 R. = 18.	None.	Well.
9 th	C. M. G.	2½	22.	5 th	T. = 99.2 R. = 32.	T. = 99.4 R. = 28.	T. = 99.8 R. = 24.	Urticaria 12 th day. Bronchitis on admission.	Well.
10 th	W. M. H.	4	23½	6 th	T. = 98.4 R. = 25.	T. = 100 R. = 28.	T. = 99.2 R. = 40.	(Tracheotomy 17 th hrs.) Albuminuria 3 rd till 19 th day.	Well.