Clinical observations on the serum treatment of combined scarlatina and diphtheria and scarlatina.

Marion H. Archibald
M.A. M.B. Ch.B.
Clinical notes of 3 groups of cases admitted to the scarlet fever ward of Bucknall Hospital: 

Group I consists of 18 cases of scarlatina treated with diphtheria antitoxin and polyclonal antitoxin to cocciæ serum (Parkes Davis).

Group II consists of 10 cases of scarlatina treated with diphtheria antitoxin.

Group III consists of 4 cases of scarlatina treated with polyclonal antitoxin to cocciæ serum.

A swab was taken from the throat on admission in every case which showed membrane formation or submucous ulceration and stained with alkaline Methylene Blue. In cases in which the Klebs-Loeffler bacillus was present in large numbers, determined by
the general arrangement of the bacilli in the microscopic field and the dark dot at each site of the bacilli, distributed antitoxin was administered at once. In some cases cultures were made the inoculation of guinea pigs was not practiced. In cases in which there was a preponderance of streptococci and organisms other than the Klebs-Lewtizer bacillus, antistreptococci serum was given.

The method of administration of the serum was by deep injection into the subcutaneous tissue of the buttck with aseptic precautions. Although large amounts of serum were given in this way to small children there was never any abscess formation at the site of injection. Dephlegmatized antitoxin was given by the mouth in one case only and seemed quite effectual.
but the lesion is insignificant.

On the temperature charts the injection of serum are noted:

\[ \text{u.g.d.s.} = \text{unit} \times \text{gram} \times \text{dilution} \times \text{serum} \]

\[ \text{c.c.s.s.} = \text{cubic centimeters} \times \text{antitoxin} \times \text{serum} \]

The day on which desquamation commenced is marked.
I.

Clinical notes on 18 cases of combined scarlatina and diphtheria treated with diphtherial antitoxin and polyvalent antistaphylococci serum.
Name: William Frock (10)
Admitted: Sept. 3rd 1908
Notified as: Scarlet Fever
History: Sept. 1st—headache, vomiting, diarrhea.
Rush seen on Sept. 3rd.
Previous Illnesses: Operation for adenoids.

On examination: Patient was a thin, poorly developed boy. A typical rash, consisting of an erythematous flush and closely packed papules, was present on the arms, and a faded rash on the back, chest, and lower limbs. The limbs were covered by greyish yellow patches.
The tongue purred; the cervical glands enlarged; the heart and lungs were sound.
The urine showed no abnormal constituent, examination of sputum from throat showed the presence of diphtheria bacilli and streptococci.

Treatment: Sept. 2nd 10 c.c. antistrophlococci serum

1 c.c. 2,000 unit antitoxin.

Locally the throat was treated with glycerine and salicylic acid.

Progress: Sept. 5th. The patches were gone from the tonsils but slight ulceration remained.

Sept. 9th. The throat was quite clean and the condition of the patient satisfactory.

Sept. 23rd. All traces appeared in the urine and blood on Sept. 26th. The patient was treated for acute nephritis and recovered on October 11th.

With the exception of the appearance of a haemorrhage manner in the palatine area of the throat, feeling some weeks, the convalescence was thereafter uninterrupted.
Name: Violet Clunn (3)

Admitted: Sept. 3rd 1908

Notified as: Scarletina

History: August 31st, diarrhea and vomiting

Rash seen Sept. 1st

Previous Illnesses: Measles, Bronchitis

State on Examination: Development fair:

Brilliant scarlatiniform rash, on chest, back

Lips: Tongue covered with a white, furred membrane

Eversion of both towels: Cervical glands enlarged:

Heart: Lungs: Sounds: No abnormality in urinal:

Swab from throat shows streptococci & diptheria bacilli:

Treatment:

Sept. 4 12 4,000 units of bact. antitox.

Sept. 6 16 10 c.c. anti-streptococc. sem.

Sept. 11 16 10 c.c. anti-streptococc. sem.
The throat was treated locally with glyciline & sulphanil acid.

Progress: Sept 7. Right tonsil was clean the left grey, the glands of the neck were much enlarged. There was an ulcer at the left of the tongue and a nasal discharge. There was some regurgitation of phlegm through the nose in swallowing pointing to paralysis of the palate.

Sept 10. The patient was delirious and the regurgitation continued.

Sept 12. The regurgitation ceased & the patient began to sleep well.

Sept 23-25: A trace of albumen in the urine.

The nasal discharge was very scanty and continued till October 31st.

The patient was discharged from the hospital in good health on November 7th.
Name: Frank Heath (f)
Admitted: Sept 8nt 1903
Notified as: Scarlet
History: Sept 6th Headache, sore throat.
Rash Sept 7nt
Previous Illnesses: colds in winter
State on Examination: Development poor;
Vegetation rash all over the body;
Limbs inflamed & swollen. Tongue thick
furred. Cervical glands much enlarged.
Nasal discharge.
Treatment: Sept 8nt 1000 anti-streptococcus serum
   " 9 10 cc ...
   " 11 10 cc ...
   " 12 10 cc 6000 units unitn
   " 13 10 cc. unitn.
   " 14 20 cc ...
   " 15 10 cc ...

Offensive nasal discharge.
Sept 10. Rash still very bright.
Sept 11. Discharge from ears, greenish.
Offensive: ulcers in scrotum at night.
Sept 15. Pubis hatched fair, now small & irregular: colon thic: throat very inpatient.
Injured covered with a thick brown pust. Patient comatose.
Inguinal transverse with normal saline solution at 2 P.M.
Sept 16. Died at 5.40 P.M.
Name: Hilda Mitchell
Age: 14
Admitted: Sept 16th 1908
Noted on as: Scarlatina
History: Sept 11th headache, sore throat, vomiting: Rosh Sept 15th
Previous Illnesses: Measles
Stool on Examination: Development good.
Scarlatina rash all over body: Tongue swollen, inflamed; large white patch on left lobe; cervical glands swollen; enlarged: Heart & lungs sound: no albumin in urine; Swab from throat diphtheria bacilli + some streptococci
Treatment: Sept 16th 6,000 unit of H.F. 6th
       18th 10 C.C. antitoxin streptococci.
Local treatment: Glycerine Sulphum acid.

Progress: Sept 17. Left track clean.
smallest ulcer on right
Sept 20. Throat clean.
Sept 26. Rise in temperature due to constipation.
Sept 27. Scrum rash on body & face.

Convalescence uninterrupted.
CASE V

Name: Reginald Mitchell (13)
Admitted: Sept 16th 1905
Notified as: Scarlet

History: Sept 16th headache, sore throat, vomiting: Rash Sept 16th

Previous Illnesses: None

State on Examination: Typical scarlatina

rash all over body: Tongue red & swollen

white patches on left tonsil: Inflamed pharynx

no enlargement of cervical glands:

Heart & lung sound: No albuminuria:

Swab from throat: Disintegrated bacilli

Streptococci:

Treatment: Sept 16th 6000 cc. Appenecin

" 17 10 cc. anti-streptocines
Local treatment of throat: glycerin & sulfuric acid.

Progress: Sept. 18, the bubo had disappeared from the left head but slight ulceration remained.
Sept. 21, speaks on both heads.
Sept. 24, throat clean.
Oct. 4, 5, 6, transient ulcerae but very slight.
Convalescence thereafter uninterrupted.
Case UT

Name: Doris Mitchell (10)
Admitted: Sept 16 1908
Notified as: scarlatina
History: Sept 15 sore throat & vomiting.
Rash Sept 16

Mucous Membranes: normal
Chromat: Stype on examination: development good.

Brilliant scarlinal rash all over body:
Wells indrawn: large white patches on
left limb: tongue slightly furred.
Heart & lungs sound: no albuminuria.
Swab from throat: diphteritici bacilli 
& staphylococi.

Treatment: Sept 16 6000 units antitoxin.

17 10 00 antistaphylococci 5000
Local treatment of throat - glycine sulphurised.

Progress: Sept 18. Patch gone from floor
  slight ulceration still
No albuminuria and an un-
interupted convalescence.
Name: Lizzie Hopwood (7)
Admitted: October 6th, 1908
Notified as: Scarlet fever
History: Oct 3rd: headache & vomiting
Rash Oct 4th
Premor: Illness: Measles
State on admission: Development: Very poor
Bright scarlatinna rash all over body
Nails: Swollen & inflamed greyish white patches on both:
Tongue covered with a brown fur: slight enlargement of
arotic & angular glands:
Lungs: Sound
Spleen: System no masses in the pelvis
area of the heart: No albuminuria
Swab from throat: Diphteria bacilli
Streptococci
Local treatment of throat - glycerine sulphate, and
Treatment Oct 5
10 cc. antitoxin serum
6 0.000 unit sulphocyanate
8 1.000 unit...
15 10 cc. antitoxin serum.

Progress: Oct 6: Throat almost healed in
middle line. Some membranes far came
away on treating it locally.
Oct 7: White patch on left throat clearing.
Oct 8: delirium all day.
Oct 9: Ulceration of throats extending to hard
palate.
Oct 10: Ulceration of tongue and mucous
membrane left cheeks.
Oct 12: Ulceration gone: Ulceration of
throat formed till Oct 20 in
Oct 21: cervical glands more swollen.
The swelling gradually disappeared.
The pulmonary systemic warmer remained
unchanged. During convalescence the
pulse was at times slow and
shocklike by drochione for 1/20 was given
by hypodermically night & morning.
There was no albuminuria.
Patient was discharged in good health on Dec
**Name:** Samuel Jordan (9)  
**Admitted:** October 7 1908  
**Notified as:** Scarlatin  
**History:** Oct 6 head ache, sore throat, vomiting. Rush Oct 7 (6)  
**Premor Illness:** Diphtheria: Measles  
**State on Admission:** Development good  
**Typical scarlatinal rash all over body:**  
**Tongue:** inflamed: large white flat on both sides; tongue covered with a white fur; marginal cervical glands enlarged; lungs sound; haemorrhagic murmurs in heart; swab from throat streptococci, diphtheria bacilli  
**Treatment:** Oct 7 to 10 000 calomel 6000 units diphtheria serum  
9 6 000 units (diphtheria)
Local treatment: glycerin & ice查封 acid.

Progress: Oct 10: Palpate 1 year from injury.
but geyers, left.

Oct 15: Thrust clean.

Grey patches on hand, face.

Oct 16: Haemorrhage

Drily healed over beard.

Nystagmus 1/20 given.

night a running hospital.

Oct 19: Haemorrhage family

heard.

Convalescence uninterrupted - X0

ordered.
**CASE IX**

**Name:** Birdie Drew (10)

**Admitted:** Nov 22nd 1908

**Noted as:** Diphtheria

**History:** Nov 20th headache, sore throat, vomiting. Rash Nov 22nd.

**Previous Illnesses:** Measles.

**Stail on Examination:** Development good. Typical scarlatinial rash all over body. Lymphs swollen, inflamed; large white patch on left frontal extending far back, with split on right frontal; tongue covered with white fur; no enlargement of cervical glands; palpebral Jerks absent.

**Swab from Throat:** Diphtheria bacilli.

**Treatment:** Nov 22nd 8,000 units diphtheria.
Throat inoculated with Jeff Salicylate's (sodium salicylate + iron. Ferri Parile).

Progress: Nov. 23. Patch gone from throat
         " 24. Blisters, grey.
         " 25. Tonsils, still grey—pallor.

      (not conducted)
         " 27. Tonsils clean.

Dec. 10. Coldmen in arms which persisted until Dec. 20. Throat was no blood in the
         vermico, and no oedema of
         face or legs.

Converses there after uninterrupted.
Case X

Name: Elsie Moss (6)
Admitted: Nov 27th, 1908

Notified as: scarlet fever + diphtheria

History: Nov 25th, headache, sore throat, Rash, Nov 27th. No previous illness

State on examination: Child poorly developed, pale. Scarlet rash all over body:

Large greyish white patches covering both tuckels: strawberry tongue:

No enlargement of cervical glands:

Heart & lungs sound:

Swab from throat: diphteria bacilli.

Treatment: 2,000 units dip. antitoxin, thrice daily, 10,000 Nov 27th,

6,000 Dec 2nd

10 cc antitoxin intramuscular on Dec 6th

10 cc antitoxin intramuscular on Dec 10th
Throat treated with Glycerine Eucryptin and
Proxin. Nov 28 a Necrotic patch on left hand
right tonsil clean.
Dec 2 nd Slight on left tonsil cured.
Rash faded.
Dec 3 rd Sloughing patches on tonsil
Squamous: Stomatitis of Tongue.
Dec 6 th Throat clean.
Dec 13. Serum twice, all over body
Throat clean: Herpes labialis.
Dec 16 th Serum twice gone:
tonsil gland enlarged.
The pulse was weak & irregular
during the acute stage & cardiac
stimulants were given.
Jan 7 th - Jan 16 th albumen in
urine varying in amount but
no blood present or casts &
no edema: Intervalence
thereafter uninterrupted.
**Name:** Doris Goodwin  
**Admitted:** Dec 9th 1908  
**Noted as:** Scarletina  
**History:** Dec 8th, headache, sore throat, vomiting: Ract. Dec 8th  
**Previous Illness:** Measles  
**Slut on Examination:** Development good. Bright scarlatinial rash on chest, back, arms. Tonsils inflamed and large gray patches on both. Tongue swollen, papillae projecting through it. White fur: no enlargement of cervical glands. Heart & lungs sound: No albumen in urine.
Treatment: 4.000 units antitoxin Dec 9th
10 cc. antitoxin every sem. day

Progress: The patches had gone from
tho throat tho day after
administration but sore ulceration
was left. It was treated with
glycerine & sulphur ointment
loclly.

Dec 11th The throat was clean but
inflamed & raw.

The pulse was weak on admission
and irregular for some days.
Cardiac stimulants were given
but discontinued on Dec 14th.

Convalescence uninterrupted.
**Case XIX**

<table>
<thead>
<tr>
<th>Name:</th>
<th>Lonzia Price (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted:</td>
<td>December 30th 1908</td>
</tr>
<tr>
<td>Noted as:</td>
<td>Scarlet Fever</td>
</tr>
<tr>
<td>History:</td>
<td>Dec 25th: headache, sore throat, and rash</td>
</tr>
<tr>
<td>Previous Illness:</td>
<td>Chickenpox</td>
</tr>
<tr>
<td>Status on Admission:</td>
<td>Development poor, child thin, pale</td>
</tr>
<tr>
<td>Well-marked scarlatin rash all over body: faucial inflammation, large greyish white patches on both tonsils leading to the uvula; cervical glands enlarged on both sides</td>
<td></td>
</tr>
<tr>
<td>Heart &amp; lungs sound: no albuminuria</td>
<td></td>
</tr>
<tr>
<td>Swab from throat: diphtheria bacilli seen</td>
<td></td>
</tr>
</tbody>
</table>

**Treatment:** 10,000 units diphtheria antitoxin Dec 30th
6. 000 u. depot antitoxin Jan 5
10 c.c. antitoxinoccus mem Jan 7
10 c.c. " 14

Stimulants of the mouth developed the
day after admission so a mixture of Citron
Alcohol and Hydrochloric acid was used.
Progress: Jan 1st 1905 the throat was
cleaner but grey sloughs were present
on the tonsils.
Jan 6th after the administration the
previous day of a second dose of antitoxin
the sloughs were thick & separating from tonsils.
Jan 7th throat cleaner - patches gone
but ulceration remaining
Jan 10th the ulceration had gone from
the throat and did not relapse.
The pulse was rapid, weak, and irregular
for the first fortnight after admission.
so cardiac stimulants were given.
Convalescence from Jan 10th uninterrupted.
**Case X11**

**Name:** Nancy Fairbanks (5)  
**Admitted:** Jan 8th, 1909  
**Noted as:** Scarletina a debilitated  
**History:** Dec 28th headache, some threatened vomiting (2,000 units antitoxin given) Reck Dec 31st  
**Previous Illness:** Measles  
**State on admission:** Development fair  
**Well marked scarlatinian rash all over body: large greasy white patches on both foreheads:** Lumpy red swollen  
**Cervical glands enlarged on left side:** Heart & lungs sound: sputum from throat: deep red bacilli  
**Treatment:** 8,000 units antitoxin
Local treatment of pharyngeal abscess.

Progress: Jan 2nd: Throat cleaned.
Jan 4th: Decongestant removed.
Throat clean: 1/4 cup of lignite.

Jan 12th: Ulcer in throat.
10 cc antisepse: Somnium.
Locally 1-1000 sal pellagra.
J. Mercury.

Jan 15th: Throat clean.

Jan 25th - Feb 1st: Night achyness.
Patient forested three large round worms 1/46 in. in habitat.
Convalescence from January 25th.
Satisfactory.
Name: Ethel Bradburn (7)
Admitted: Dec 10th 1908
Noted as: scarlatina
History: Dec 7 th Headache, vomiting
Dec 8 th Rash
Primary Illness: Measles + Bronchitis
State of Examination: Development phase:
Bright red rash over all over body
marked on the legs: Tongue covered with a white membrane: left
Cervical glands enlarged: heart &
Tung's sound: no albuminurea
Swab from throat: dipthoe bacilli
Treatment: Dec 10 th 10,000 units until
11 14,000
Dec 15 10 c.c. antistreptococci serum

" 18 10 c.c.

Local treatment: glycerine saline

Progress: Dec 12 Patches still on tongue

" 13 Patches clearing off

" 14 Tongue very grey

" 16 Throat clean

" 19 Stimulants of tongue treated with a mixture of Potassium Chlorate & hydrochloric acid—disappeared in a few days.

During the first fortnight the pulse was rapid, weak and cardiac stimulants were required. Convalescence uninterrupted by any complications.
**Case XV**

Name: *Eveline Williamson (5)*

Admitted: Dec 22nd 1905

Noted as: Scarletina

History: Headache, sore throat - Dec 20th

Previous Illness: Rheumatic

State on admission: Development poor

Rash typical but faded seen all over body:

Greyish white patches on both sides:

Tongue swollen - covered with a thick white fur:

Cervical glands enlarged on both sides:

Heart:

Lungs: sound

No albuminuria

Treatment:

Dec 22nd 8,000 unit antitoxin

Dec 23rd 6,000
Local treatment of throat: Persuade hydrogen peroxide into

Progress: Dec 22nd no improvement in

Dec 24th patches gone but

grey ulcers in flabellum

Jan 5th a swab removed from

throat: diagnosis Throat

flabellum in longs mum

Jan 6th 30,000 umb. culture

Jan 7th ulcers in flabellum

still persist

200 cc. antitoxic serum

Jan 8th Throat cleanser

Jan 9th Throat clean

Jan 25th Feb 1st a small

amount of stool was

made and a stool

organisms probably Bact.

strapped under

treatment with antitoxin

Convalescence uninterrupted with

the exception of a slight discharge

from the nose which disappeared.

The latter for the first 3 weeks

was very weak + stimulants were given.
Case XVI.

Name: Frank Hackett (8)
Admitted: Jan 3rd 1909
Noted as: Scarletina
History: Jan 3rd Headache, sore throat

Previous Illness: None
State on Admission: Development good:
Bright scarlatinna rash all over body:
Follicles inflamed and a few white spots on
Longer swollen & furred; slight enlargement of cervical glands:
Heart & lungs sound: no ulcers or ulcera:
Progress: Jan 3rd. The rash wore
Healed with little effa. Much improved
Jan 5th. Throat normal & change
A swab taken from the throat contained diptheria bacilli & staphylococci so 6,000 units penicillin were given by the mouth.

Jan 7 Nasal discharge continued & split in limbs present.
10 cc antistaphylococcal serum injected.

Jan 8 in Limbs clean.

Jan 9 in Nasal discharge ceased.


Convalescence uninterrupted. The child has some weakness in the muscles of the lower limbs. difficulty in walking which gradually improved.
Case 17.

Name: Edith Adams (6)
Admitted: Jan 25 in 1909
Noted as: Scarletina
Diagnosis: Scarletina
Exit Jan 22
Recd Jan 28

Previous illness: Scarletina
State on admission: Development: Good
Bright scarlatinat rash on cheek:
Noches swollen = gale: Tongue swollen
Sfurred: M enlargement of cervical glands on both sides: Heart: Lungs sound: No albuminuria:
Swab from throat: diphtheric bacilli, streptococci, diplococci
Treatment Jan 25 6,000 units antitoxin
Jan 28 20 cc water injection
Local treatment of throat: Penicillin 24,000 units.

Progress: Jan 26 Throat very enlarged
Right lobe clean: Slight left
Jan 27 Throat clean:
Rash very bright
Jan 28 Some ulceration of left
lumbar
20 cc x 10 subcutaneous
injected
Jan 29 Throat clean
With the exception of a rise of temperature
on the 38.5-39°C we had no days for
which no definite cause was discovered, and the
development of a mild and reversible
systemic disease which gradually
disappeared, convalescence was
not interrupted by any complication.
Case XVIII

Name: Harold Wilkinson (h)
Admitted: January 29th, 1909
Diagnosis: Scarlet Fever
History: Headache, sore throat, vomiting
Jan 26th. Rash Jan 28th
Present Illness: Hooping cough
Status on Admission: Development fair
Fading scarlatinal rash all over body
Lymphs inflamed: Large white patches on right loin
Leg covered with a thick fur which was peeling off
Swab from throat: Diphteria bacilli
Streptococci: slight endocardium
Tonsils:
Treatment: 8,000 units astramycin Jan 24
2000 units streptococci Jan 27, Feb 2
Local treatment of throat 1-1000 merbium iodine.


Jan 31st. Throat clean.

Feb 2nd. Small grey patch on right tonsil. Cervical glands on right side much enlarged.

20° C.C. anti-epidemic serum injected.

Feb 3rd. Bruary swelling on right side of neck.

Feb 12. Lucrin made into swelling on right side of neck.

Feb 20th. Discharge from abscess cleared, healing began.

Convalescence thereafter uninterrupted. Cardiac stimulants were given during the first week in hospital as the pulse was weak, rapid, and irregular.
In Case I the patches on the throat separated the day after antitoxin was given. Ulceration of the throat persisted but there was no discharge from ear or nose. Acute nephritis occurred but was recovered from.

Case II only a small dose of antitoxin, 4,000 units, was given and a nasal discharge and paralysis of the palati developed which were later recovered from. There was transient albuminuria.

Case III was a fatal case on which repeated doses of antistreptococcic serum and 6,000 units antitoxin seemed to have no effect.

Case IV the patches present on the throat on admission cleared up after administration of 6,000 units of antitoxin. The purpura of the throat persisted.
and the temperature so high. 10 c.c. anti-streptococci serum were injected and two days later the throat was clean the temperature fell.

Cases II and III followed a similar course. In Case II there was a transient albuminuria which was very slight but no discharge from ears or nose nor cervical adenitis.

Case VII. The patient did not begin to separate from the throat till 4,000 units of antitoxin were given. The temperature fell after a second dose of 4,000 units. 10 c.c. anti-streptococci serum were administered on the 13th day of disease to lower the temperature. There were no discharges from nose or ear, no albuminuria.

Case VIII. The temperature remained high till 6,000 units of antitoxin.
were given on the morning of the 2nd day, followed by 4,000 units at night. The patches did not separate from the livers till after the administration of the antitoxin. There were no complications.

Case IX. Patch separated from the livers after administration of 8,000 units antitoxin; ulceration persisted for 5 days. There was ulceration but no discharge from ears or other complications.

Case X. The day after administration of 10,000 units antitoxin, the patch separated from the livers. Antitoxin was administered again 5 days later as there was still a patch on the left livers. Persistent ulceration of the livers was treated with antitetanus Ecrum.
CASE VII. Patches were gone from limbs the day after admission. No complications supervened.

CASE VIII. Patches cleared up. 2 days after admission (10,000 anti-antitoxin having been given) there was sloughing of the limbs, the temperature had a tendency here 20 units anti-tryptococcic serum was given on the 15th to 20th day of the disease after which there was no further rise. No complications followed.

CASE IX. On admission 10,000 anti-antitoxin were given. The throat cleared up three days later. Ulceration began again nine days later. 20 units anti-tryptococcic serum was given. There was slight albumin for a week—no other complication.

CASE XIV. 10,000 units antitoxin given on admission but patches formed.
For 8 days a ulceration was left followed by inflammation.
10 cc. antistreptococci serum were given on the 9th and 12th days which reduced the temperature and the ulceration disappeared.

Case XII. Ulceration of larynx was very persistent. It finally cleared up after 18,000 units antitoxin.
20 cc. antistreptococci serum had been given. The ulceration later was probably due to cystitis.

Case XIV. A swab was not taken till 8 days after admission when a nasal discharge developed.
6,000 units antitoxin were given. 10 cc antistreptococci serum in the throat cleared the nasal discharge disappeared.

Case XVIII. Pulse cleared up after 6,000 units antitoxin. Ulceration returned but disappeared later.
20 c.c. antitoxin serum were given.

Case IV. The throat cleared
two days after the injection of
antitoxin, but slight ulceration
returned. The temperature was
taking after 20 c.c. antitoxin serum were injected. The glands
on the right side of the neck
swollen and had to be incised
but healed up quickly through
Clinical notes on 10 cases of combined scarlatina and diphtheria treated with diphtheria antitoxin.
Name: Annie Doyle (4)
Admitted: Nov 26 1908
Noticed on: Scarletina, Discomfort
History: Nov 22 — headache, vomiting
Prem: Illanes: none
Status on Examination: Development fair
Fading but typical scarlatinum rash
All over body: Macul, red, swollen:
grey patch on left breast: lumpy
covered with a thick white fur:
Glands on left side neck enlarged:
Heart:clear, sound: No albuminuric
Swab from Throat: Diphtheria bacilli
Treatment: 6,000 units watkins
Glycerin & Salicylic acid locally
Progress: The patch came off the left foot the day after admission. The enlargement of the glands on the left side of the neck disappeared gradually.

Convalescence uninterrupted; no albuminuria or other charges from nose or ear.
Case II

Name: Eletta Woolley (7)
Admitted: Nov. 28th 1908
Noted as: scarlet fever
History: Sore throat & vomiting Nov. 25
Rash Nov. 26th

Previous Illness: Pneumonia 2 years ago
Stobs on examination: development poor.
Brilliant rash with pell'chial point; all over body; limbs much involved.
Swollen, large white patches on left lower: strawberry tongue: slight glandular enlargement on left side jaw.
Swab from throat: Diphtetic bacilli
Treatment: 8,000 units arsphenamin Nov. 28
Glycerine & sulphur oozed locally
Progress:
Nov 29th Necrotic patch separating from left labial.
Nov 30th Throat clean.
Dec 1st Slight ulceration left labial.
Dec 2nd Throat clean.
The pulse was weak & irregular during the 1st week in hospital so cardiac stimulants were administered.
There were no complications during convalescence.
Case 111.

Name: Nettie Smith (12)

Admitted: Nov 30th 1908

Noted as: Scarletina

History: Nov 29, headache & sore throat, Rash Nov 29.

Previous Illness: Measles.

Stated on Examination: Development good.

Very bright facial rash all over body: laryng. immediate a white slit on both; tongue covered with a white fur; no enlargement of glands.

Heart & lungs sound: Swab from throat; diptheria bacilli marked.

Treatment: 6,000 units antitoxin Nov 30th.

Locally glycerine sulphate acidi.
Progress:

Dec 1st  Small white patches behind
No left tonsil : right clean.

Dec 2nd  Slight ulceration of back teeth
Back still very bright.

Dec 3rd  Throat clean - back still
very bright.

Dec 4th  Back fading
Convalescence uninterrupted by
complication of any kind.
Case IV

<table>
<thead>
<tr>
<th>Day of Dec</th>
<th>D 6 7 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse</td>
<td>120.100.40</td>
</tr>
<tr>
<td>Resp.</td>
<td>12.12.40.48</td>
</tr>
<tr>
<td>Motions</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
</tr>
<tr>
<td>Sp. Gr.</td>
<td>1.020 1.036</td>
</tr>
<tr>
<td>Reaction</td>
<td></td>
</tr>
<tr>
<td>Chlorides</td>
<td></td>
</tr>
<tr>
<td>Allen:</td>
<td>6 7 8 9</td>
</tr>
</tbody>
</table>

Name: John Hall (5)
Admitted: Dec 30th 1908

Notified as: Scarletina
History: Dec 26th head ache + vomiting
Rash Dec 25th

Previous Illness: none

Examination: apparatus poor:
Scarletina scarlatinata rash all over body:
Vesicular on chest: white patches on arms
Red lines on face covered with thick white fur feeling off on patches:
Prepuce offensive discharge from nose
Eyes: swab from throat: discharge

Treatment: 10,000 units: calcium Dec 30th
4,000 units: Nov 18th
Local treatment of injury of throat
with Peroxide of Hydrogen and a
mixture of Potassium Chlorate and Hydrochloric
Acid given.

Progress.
The patient was delirious on admission
and continued so for 4 days
frequently throwing up and going to
and from bed.
The pulse was very rapid and weak.
The discharge from the nose and eyes
increased; coma supervened in
the 2nd day and the child died
the pulse stopping some time before
the respiration.
Name: Frances Hall (7) Sickle of premiers
Admitted: Dec 30th
Noted as: Scarlet fever
History: Dec 27th: Some fever; headache; vomiting: Reached Dec 28th
Premises: Illness: Measles
Stools or Stool: Development for: Brilliant scarletines with all over body
mottled in arms: large white
lupus on both hands: lungs creased
with a thick white fur: cervical
 glands enlarged more or right side.
Heart: Large; sound: Swab from
throat: diptheric bacilli
Treatment: 10,000 units antitoxin
Local treatment of Throat: Percutaneous Injection.

Progress:
Dec 31st: Patched leg now t clean if Throat.

Jan 1st: Throat clean.

Jan 10: Ulceration in arm which persisted until 1867 in spite of treatment but was only a trace all the time.

The enlargement of the glands of the neck cleared gradually. There were no further complications.
Case VI

Name: Samuel Wright (5)
Admitted: Jan 24th, 1909
Nursing as: Scarletina
History: Head ache, sore throat
Jan 23rd. Rash

State on Examination: Development good
Fading scarlatinat rash all over body
Mucous membrane: large patch on left
Mild reddening to the back of the larynx
Jaw red at lip, slightly sunken posteriorly
No enlarged glands, SS. was from throat

Diagnosis: Bacilli, staphylococi, streptococi
Treatment: 8,000 units saltino
Locally Peroxide of Hydrogen
Progress:

Jan 26. Large patch still on left.

Jan 27. Throat clean; rash still present.

Jan 29. Rash faded; desquamation on neck. Throat clean.

No complications during convalescence.
Name: William Allen (15)
Admitted: Jan 29th, 1909
Notified as: Scarletina
Hospital: Jan 26, headache, sore throat
Jan 27, Rash
Primary Illness: Scarletina
Status on Admission: Settlement Fair
Trace to fecal rash on body
Large necrotic purplish patches on limbs
Lungs thickly furred: no enlarged cervical glands:
Swab from throat: diphteria bacilli, streptococci
Treatment: 10,000 units antitoxin
Locally, 1-1000 str bandages
Progress:

Jan 30. Patches gone from hands.
Throat grey a bit larated.
The throat continued to be acoiled for a while, at the end of which time it was clean.
The pulse was strong & regular.
No emphyseum occurred during convalescence.
Case VIII

Name: Ella Hall (12)
Admitted: Dec. 19 1908

Diagnosis: Scarlet fever

No rash seen.

Previous Illness: Measles.

State on Examination: Development poor.
No rash or desquamation.

Eyes: Normal.
Nose: Slight furred, papilled projecting.
Lungs: Sound.
Heart: Normal systolic murmur.

Treatment: 2,000 units antitoxin.
Peroxide of hydrogen locally.
Progress: The throat was clean the day after admission. A rash was never seen and the desquamation which began on the 13th day of the disease was very fine and by touch. The interest of the case lay in the fact that the other member of the same family had been treated at home for scarlet fever simultaneously and had died.
Name: Elizabeth Melody (24)
Admitted: Feb 5th 1909
Noted as: Scarlet fever
History: Feb 3rd head ache, sore throat; pains in back; Rash Feb 4th
Preliminary Examination: Pus in oropharynx.
Mucous membrane: development good.
No trace of a rash nor delirium.
Slight almost meeting in the middle
but covered with a white membrane.
Lung: kindly furred; cow-calf
Stomach: enlarged; heart of lungs.
Swab: Swab from throat dipthoe bacilli
Treatment: 10,000 units extrin Feb 5th
8,000
Locally. Permeable to Hydrogen.

Prognosis:
Feb 6th. Patches of red on tongue - luke good.
Feb 7th. Pulse: regular, weak.
Cardiac stimuli given.
Feb 11th. Thorax clean 75% swollen.
There were no complications and the lymphatic was dry. Slight. Patient was not discharged until April 1st. On account of impo-

J. H. Free.
Case X

Name: Elizabeth Eccleston (6)
Admitted: Dec 10th 1908
Noted as: Scarlet fever
History: Headache, sore throat, rash seen Dec 7th
Previous Illness: none

Stool and specimen: development of brilliant rash with pustules all over body: tonsils covered with a yellow membrane: tongue swollen and furred: slight enlargement of cervical glands on both sides: heart - lungs sound: no albumen in urine

Treatment: 10,000 units antitoxin Dec 10
4,000 units Dec 11
Local treatment: glycerine & sulphur acid.


Rash, trickled

" 13 Rash fading

Icturation of limbs

14 Throat clean

Diagnosis: 

During the first week the pulse was weak & irregular and cardiac stimulants were given. There was no albumen in the urine at any time & convalescence was uninterrupted.
In this group of cases the ulceration left after separation of the membrane was slight and all persistent so antitoxinose serum was not administered. Several cases had threatened cardiac paralysis.

Cases 16 and 17 were brother and sister. The brother came under treatment on the 5th day of disease when discharges from the ears and eyes had developed; associated with a tic which went all over the body. Injection of antitoxin had no effect and the case proved fatal.

The sister came under treatment on the 4th day of disease and although the throat was covered with membrane on admission and the ears of a very pronounced tic, the disease yielded to treatment and she made a good recovery.
Case 58 is of interest from the fact that it was admitted as scarlatina, but there was no trace of a rash at any time nor of any desquamation so probably was true delirium tremens. The patient did not develop scarlatina although she was among acute cases of it for 8 weeks, being dehanced on account of an impetiginous eruption on the face.
Clinical Notes on 9 cases of scarlatina treated with antistreptococccie serum (polyvalent)
Case 1

Name: Haund Walker (6)
Admitted: Sept 15th 1908
Notified as: Scarletina
History: Sore throat, vomiting, pain in abdomen Sept 13th
Rush Sept 14th
Previous Illness: Measles
State on Examination: Development good, scarlatinal rash all over body, limbs inflamed, swollen, ulceration of foot involving also the wound, tongue strawberry, cervical glands enlarged on both sides

Treatment: 10 cc. anti-scarlet fever serum Sept 15th
Glycerine, Salicylic acid locally
Progress. The throat was clean two days after admission and the temperature normal on the 4th day. There was no obvious cause for the rise in temperature on the 7-9th day. The glandular enlargement of the neck diminished after admission. Convalescence uninterrupted by any complication.
Care II

Name: Isidore Maginnis (1)
Admitted: October 19th 1908
Notified as: Scarletina
History: Headache, sore throat, rash October 19th

Previous Illness: Measles
State on Examination: Development good.
Scarlatinal rash all over body.
Throat swollen, ulcerated, structures tongue, cervical glands, right-side much enlarged. Lungs sound.
Pulmonary systolic murmur (haemic)
Swab from throat: streptococci, diplococcus, indefinite bacilli

Treatment: 10 cc antitetanococcus serum Oct 19th
Throat treated with glycerine & sulphate of soda.

Progress: Oct 20: Throat clearer but grey

Oct 21: Right trachea much swollen

Left slightly elevated

Glands on right side of neck much enlarged

Oct 22: Swellings inflamed & swollen

but clean.

The swelling of the glands of the neck disappeared almost completely and that of the trachea by the end of the second week. There was no albuminuria or discharge from ears or nose. The child was discharged in good health after 5 weeks in hospital.
Case 111

Name: Eveline Hodgkinson (6)
Admitted: Nov 18 1890

Noted as: Scarletina
History: Nov 14 sore throat, vomiting
Rust. Nov 16 16
Previous Illness: Scarletina

State on Examination: Development good:
fading but typical rash; ulceration of both tonsils; inflammation; strawberry tongue; cervical and inguinal glands enlarged; heart & lungs sound: No albuminuria.

Treatment: 1000 amphi-aphloccus. Some dyspepsia
Locally Glycerinae Boraci used 15
Progress: The ulceration of the hand persisted until Nov. 30th, when it subsided and healed completely without any complications or sequelae.
Case IV

Name: Frederick Waresham (7)
Admitted: Nov. 30th 1908

Noted as: Scarletina

History: Sore throat and vomiting Nov 29th

Rash: Nov 30th

Previous Illness: Measles

Stab: on examination: Development good: fading scarlatinaceous rash all over body, tonsils injected: tongue covered with a white film: slight enlargement of cervical glands on left side: inguinal glands on right: Heart, 3 lungs sound.

Treatment: Dec 1st 10 cc anti-scarlatinae.

Local treatment of throat 1% glycerin Boracic.
Progress: There was no alteration of the haematoxylin at any time. The
underdeveloped scarum was injected the day after admission to lower the
temperature. The rise in temperature at the beginning of the second week was due to
constipation.
No albuminuria was present and there were no discharges from ear or nose. Convalescence satisfactory.
Name: Charlie, Harp (8)
Admitted: Dec 18th 1908

History: Dec 14th, headache, sore throat, vomiting, diarrhea.
Dec 17th, rash.

Premises: Illness: Measles.

Station of examination: Development: faint scarlatinal rash all over body: small patch on right temple, left temple grey; tongue covered with a white fur; no glandular enlargement.

Swab from throat: No diptheria bacilli.

Treatment: 10 cc. antitoxin on Dec 18th.
Throat treated with glycerin, sulphuric acetic acid.

Progress:
Dec 19 - Throat cleansed, better good.
Dec 20 - Throat clean.
No apparent cause for rise of temperature.
Convalescence proceeded satisfactorily.
No ulceration or discharge.
Case VI

Name: James Shellen (5)
Admitted: Jan 7 1909
Notified as: Scarletina
History: Headache, sore throat, vomiting
Jan 6 19: Rv b, ch, seen Jan 6 19
Scarlet Illness: None

State on examination: Development poor.
Brilliant red punctate rash all over body: loins inflamed, swollen, grey.
Strawberry tongue: Heart & lungs sound: Swab from throat: Staphylococci, Streptococci, Diplococci.

Treatment: 1000 anti-staphylococcic serum injected on admission Jan 7 19.
Local treatment of throat 1-1000 Buckland & Mercury, s/l.
Jan 8th. Lungs clear. chest very bright.
Jan 11th. Cervical glands began to swell.
Jan 13th. Discharge from nose.
Jan 17th. Discharge from ear worse. as soon but throat clear.
Jun 18-19. 20 cc antistaphylococci serum injected.
Jan 20th. Nasal discharge less—left ear discharging.
Jan 22nd. Nasal discharge very little.
Enlargement of cervical glands gone: discharge from left ear the same.
Feb 1st. 20 cc antistaphylococci serum.
The discharge from the left ear was less the following day but persisted. The nasal discharge disappeared.
There was no albuminuria.
The patient was kept in hospital till April 18th.
The condition of the ear
was improving and improvement
was considered then.
Case VII

Name: Victor Cartwright (12)

Admitted: Jan 11th 1909

Noticed as: Scarletina

History: Jan 9th headache, sore throat, vomiting. Rush Jan 10th

Previous Illness: Measles, Bronchitis

Status on examination: Development good

Brilliant scarlatinina rash all over body, larynx, timbal, emphysema, white spots on both:

Injuries covered with a white fur

Submaxillary gland enlarged on left

Heart + lungs sound: Swab from throat Streptococci, Staphylococci and a few diptheric bacilli

Treatment: 20 cc antitoxin: serum Jan 11th
Local treatment — Glycerine and sulphur ointment.

Progress: Jan 12 — Throat cleaned.

Injury injected.

Jan 13 — Throat clean; injury covered with dressing and taped.

Jan 15 — Lymph glands enlarged on both sides; injury clean.

Jan 23 — Submaxillary gland on right much enlarged.

The glands did not suppurate and the swelling diminished but never entirely disappeared. Patient stated that she had always lumps in her neck. She left the hospital on good health on March 13.
Name: Jane Weidemuller (3)
Admitted: Jan 12th, 1908
Notified as: Scarlational
History: Jan 7th sore throat, vomiting
Jan 8th Rash
Previous Illness: Measles
Examination: Development fair
Bright scarlational rash present
Tonsils: injected, grey spot on both
tongue: slight enlargement of cervical glands: Heart
Lungs: sound
Swab from throat: Streptococci, Streptococci, a few dipht.
bacilli

Treatment: 10 c.c. anti-streptococci Jan 12th
20 c.c.
Local treatment: Bichloride of mercury 8th 1-1000

Tongue washed with Copper Sulfate.

Progress: Jan 13. Throat still dry.

Jan 15. Throat almost clean.

Stomatitis of tongue as before.

Jan 16. Ulceration of mouth a white

Pallet on uvula.

Jan 19. 20 cc anaestheti: semm.

given.

Jan 20. Throat clean: ulcerati-

8 Intro 20 - 7. 8

would prey.

Jan 28. Tongue free from Stomatitis:

Throat clean.

A huge of ulceration appeared in the

arms on the 27th 28th of 29th.

Days of the disease but disappeared

on the third day.

Convalescence satisfactory. No depression

from ear or nose.
Name: Mabel Daceo (II)
Admitted: Jan 28 th 1909
Diagnosis: Scarlet fever
History: Jan 27 th headache, sore throat, vomiting: Rash Jan 28 th
Previous illness: none
State on Examination: Development good.
Brilliant erythema, plus in with jumette.
All over body: Marked swollen, inflamed: limbs covered with a thick yellow fever.
No glandular enlargement.
Treatment: 20 cc every 4 hours, semi, Jan 28
20 cc " Feb 3
20 cc " 7
20 cc " 9
Progress: The lachrymal were swollen & inflamed till Feb. 11th when the swelling began to diminish. There was no ulceration of the lachrymal. The temperature remained very high for over a fortnight during which time the patient was confined and semiconscious during the day & restful by delirium at night. After the first 3 weeks the temperature remained normal and no complicating occurring during convalescence.
In the cases treated with antistreptococci serum, there was a rule slight alteration of the
bowels, which diminished after injection of the serum, and a
fall of temperature usually followed the injection.

In case VI the use of the serum on the 14th to 16th days of the
disease brought down the temperature and lessened the usual
discharge.

In case IX 20 cc of serum were given on 2 occasions to
reduce the temperature.
The cases of which we have been given are typical of the class of case admitted to the hospital. The 1st group of cases is termed combined diphtheria and scarlatina as the rash, typical of scarlatina, was associated with diphtheritic membrane formation in the throat. The rash was not in any of the cases a fortuitous erythema occurring in the course of an attack of true diphtheria as it had all the characters of a scarlatinal rash and followed the usual course of desquamation.

If we take the definition of scarlet fever given by T. Ford Eager in Alleman's System of Medicine as: an infectious febrile disease of which the most prominent features are inflammation of the faucial structures, a red punctiform rash, followed...
by characteristic desquamation, and a subsequent tendency to
inflammatory affections of the middle ear, glands in the
neck, joints, and kidneys—"all of the joints mentioned in the first part of the
definition are illustrated by the cases given, but the pro-
hibition of serum seems to check the tendency to
complications.
Cases are very seldom sent to hospital with the diagnosis of continued scarletina—diphtheria.
One case so notified proved to be measles—laryngeal
diphtheria: another E. Melody
of which notes are given page 60.
He had no rash nor desquamation, so was probably low laryngitis
although treated in the scarlet-
fever wards.
It frequently happens that
cases notified as diphtheria

are found to have a brilliant scarlatinal rash on admission to hospital in addition to membranous formation in the throat and the converse was also common.

Harriet Wright was admitted on January 24, 1807, as scarlatina. Her brother, John, whose case notes are given on page 54, had been admitted 4 days before suffering from contined scarlatina and a sister was admitted with her also suffering from the contined disease.

Harriet Wright had a typical depilatory patch on her neck but no rash and never had any congestion or other symptom of scarlatina.

Another case, Charles Salt, aged 26, was admitted on August 17, 1808, certified as depilatory with a typical scarlatinal rash and widespread membrane formation on both tonsils. He was
given 10,000 units of antitoxin and the throat cleared in 2 days. He had no complications while in hospital, and diagnosis was completed at the end of 8 weeks, when he was discharged. A few days after his return home he found himself unable to walk due to weakness of the lower limbs and the case was diagnosed as post diphtheritic paralysis.

The fact that cases with scarlatina earlier on admission to hospital are frequently notified as diphtheria (and have a typical membrane in the throat) does not indicate an error in diagnosis as the rash is generally stated by the mother to have come out after the doctor saw the child. That these cases are combined scarlatina + diphtheria and not merely scarlatina ulcerosa.
is shown by several facts:

1. The examination of a swab from the throat shows the presence of the Klebs-Löffler bacillus. The evidence is not absolutely conclusive in the case given, as inoculation experiments were not performed.

2. The throat yields to treatment with diptheria antitoxin.

3. There was very little of any infiltration of the tissues of the neck as a rule.

The condition of the throat breaks in almost every case of scarlatina and diptheria differs from that of simple diptheria in several points:

1. The membrane adheres firmly, an adherent is, as a rule, softer.

2. After the separation of the membrane in scarletinal cases, persistent ulceration for a varying length of time occurs and when another swab...
While the scarlet fever wards have been full to overflowing all winter, a large proportion of the cases having the combined disease, the adjacent yards have been more or less empty.

2. "A deep destruction of the bones in the vicinity of the part primarily involved is for most want in anthracycline than in scarlatina... the sublimation of an infiltration in the vicinity, simulating a phlegmon which going still further by continuity, involves all the tissues, includes the skin, subcutaneous, connective tissue, the cervical glands, and leads to suppuration; if this later even to gangrene: — unfortunately that is not a rare thing in scarlatina.

As already noted very few of the cases of combined scarlatina and diphtheria treated in the hospital had any infiltration of the neck.
3. Entanglement of the lungs by a membrane formation is a comparatively rare occurrence in scarlatina, and still more rare is a complete occlusion of the nasopharyngeal and tracheal passages. A very unusual case occurred in this hospital. Charles Hallam, aged 7 years, was admitted on January 21st, 1909, suffering from the combined disease of scarlatina and croup. He was treated with antitoxin and the patch which covered one lobe cleared off in two days. He recovered without any complication but on the day he was to be discharged had the shock on his back suggestive of chickenpox. So he was detained in a ward with other convalescent cases of scarlet fever who had developed chickenpox.
He developed no further symptoms but on April 12 a fever began without any rise of temperature or acceleration of pulse rate. On April 15 he had an acute attack of dyspnea, cough, and retraction of the chest wall. The sucking in of the intercostal spaces became very marked, and the breathing so difficult, that the formal tracheotomy had to be performed at 12 P.M. The formal tracheotomy was performed at 12 P.M. After the formal tracheotomy, large pieces of membrane were coughed up. The wound confirmed the diagnosis of diphtheria which had been made. Whether the diphtheria bacilli had remained latent in the throat and suddenly became active or whether he was infected by another case of scarlet fever, it is impossible to say.

4. That paralyzes that fellow genuine diseases are about in the erysipelas diseases accompanying scarlet fever.
... In the case of a somewhat severe angina, involving the soft palate, an incomplete deviation of the nasopharyngeal cavity may take place, and so will during swallowing as in any other condition. It is merely the result of the inflammatory process in the area involved by them. Moreover, consistent with the scarlatinal angina, stools pass from the nose and may be swallowed by the patient. There is no proof that a diaphoretic paralysis is present (Hendon).

The only case which had regeneration was that of Violet Clark (p. 3) which may be influenced by the above theory.

A large number of the cases had a tendency to paralysis of the heart, evidenced by a weak, rapid, irregular pulse.

The case of Charles Salt already quoted was the only one with
actual paralysis of the lower limbs, but weakness of the muscles of the legs in walking and absence of the knee jerks is frequently noted, pointing to a partial paralysis.

It must be taken into consideration that paralysis is exceedingly rarely seen in the diphtheria wards, owing to the early administration of suitable doses of antitoxin.

Lastly, the mortality from the continued disease of scarlatina + diphtheria with serum treatment is not very high. In 78 consecutive cases treated there were 7 deaths, or a percentage of 8.9, while the death rate from diphtheria during the same period was 8.04%.

The 27 cases quoted in which antitoxin was employed illustrate the following points in connection with its use:
A. In the treatment of scarlatina and diphtheria

1. In the persistent ulceration of the throat—after separation of the diphtheritic membrane, which on examination of a swab is found to be streptococcal in origin it appears to check the ulceration and prevent its spreading if the Enzooticus is applied to the throat.

2. In checking pyrexia which returns after separation of the diphtheritic membrane.

3. In preventing the occurrence of the complication of scarlatina and diphtheria, which occurs but is uncommon. Also in bad cases of diphtheria so it can not be determined whether it is due to the scarlatina or not.

B. In the treatment of scarlatina

1. If administered early before the development of discharge from the nose or ear it know
The liability of their occurrence:
(1) If given after general lassitude has supervened it seems to have little effect.
(2) It is especially in reducing high temperatures as in case of Habbo Drew (Page 83).
(3) It checks the tendency to cervical adenitis & arthritis, but does not prevent the occurrence of albuminuria.