Diphtheria: a study illustrated by cases.

History and distribution

The disease is an ancient one. It was first described in the 2nd century and afterwards long referred to by various authorities. Since the middle of the 19th century it has been more or less prevalent over a wide area including Europe, North America, Australia, India, China, South Africa and certain parts of South America. When it was in the River Plate in 1897 the disease was of a severe type and very prevalent in certain districts of the province of Buenos Aires at Rio Permeambece and other Brazilian ports. Heard of the disease but not in epidemics of any importance. It does not appear to flourish in the tropics. The tropical countries are not exempt, without it.

Etiology.

Like most infectious diseases diphtheria has its special seasonal prevalence. In this country (according to the number of deaths by statistics) the Autumn and early winter seem to be the favorite times for an outbreak. This agrees with my own observation's extending over a period of 14 years in Berwickshire. Most of the cases have occurred in November and December, and in two consecutive
years the number assumed the nature of an epidemic.

The question as to the influence of rainfall is an

interesting one. Newsholme's ideas are as follows:

"An epidemic never originates when there has been

a series of years in which each year's rainfall

is above the average. An epidemic never originates

during a wet year, i.e., during a year in which

the rainfall is above the average; unless this year

follows on two or more dry years preceding it.

The epidemics of Diphtheria, for which accurate

data are available, have all originated in dry years.

The greatest and most extensive epidemics have

occurred when there have been 10 or 15 consecutive

dry years. The epidemic sometimes starts near

the beginning of this series at other times not

until near its end. Dry years reduce low

ground water. And we find therefore in the years

of epidemic diphtheria that the ground water

is exceptionally low. The exact variations in the

ground water which most favor an epidemic

Cannot with the data to hand as yet be stated

but it is probable that when this is cleared up

it will become clear why in exceptional years

which have a deficient rainfall an epidemic

"diphtheria is either absent or but slight.

Newsholme then suggests that the bacillus faces
"a saprophytic existence in the soil and that its growth is favored by a low level of ground water. The rise of the ground water consequent upon rains, drives the bacillus out of the soil, it may then become parasitic upon man, and an epidemic arises."

Certainly my own observations wholly agree with this last statement as far as the effect goes. Anything like an epidemic has always occurred after a dry season followed by heavy rains also that isolated cases appearing during such dry weather have not led to a spread of the disease. In nearly all instances of isolated cases have been able to prove that the infection has been imported from some center where the disease is prevalent; and has not originated de novo. So far as known it has yet to be proved that the bacillus lives in the soil.

Heave not into the disease associated with other diseases. Scarletina and Measles undoubtedly the Angina of the throat, and the Calvarial condition associated with the latter predispose to infection, apart from the fact that the individual's resistance power is lowered by disease.

Age and Sex. Most of my cases have been under ten years of age. The disease attacking boys and girls equally. Among adults more
females than males, but this can be accounted for by the duties of female sex in attending to the sick which exposes them more to infection.

Dissemination. The commonest cause of communication of the disease is by personal contact of the healthy with the affected nurses, mothers, and relations. Kissing or coming in contact with a sick child have frequently caused those in attendance on a case to avoid leading even the patient if possible and thus in healing the same lad in air, indirectly it may be transmitted by means of toys, handkerchiefs, utensils for eating and drinking out of. A third person does not often convey the disease medical men if they are careful rarely if ever cause infection. In one instance a third person conveyed the disease in the following way. Some time ago I was called to a case (a girl of 13) at a farm house. I found on inquiry that the nurse had recently been in another situation with a lady in a distant town. The mistress had had a sore throat which turned out to be diphtheria after the nurse went back. The nurse had no sore throat, but I saw the child under her charge, and she developed the disease when my case was convalescent 6 weeks after leaving her former situation. On another occasion I traced
the infection to a photograph that had been in a child's nursery when she was suffering from diphtheria. The child died and the photograph was sent for post to a cousin. The cousin was in the habit of kissing the photograph and developed diphtheria a week after receipt of it. Still another instance in which a dress had hung in an infected room and was sent to a relative; a child of 8 the dress was put away for some weeks and then remodelled for my patient; she wore it a week and then developed the disease.

Milk may be a dangerous source of infection: two or 3 cases have come under my notice as being due to an infected person distributing milk while suffering from a bad throat which on bacteriological examination proved to be diphtheria. Water supply does not seem to convey infection. Faulty sanitary arrangements in connection with the removal of sewage and refuse do not seem to be a source of danger except by lowering the resistance of various people against infection. The greatest improvements in sanitation during the last 20 years have lessened enteric outbreaks, on the other hand.
Statistics show that diphtheria is on the increase. Parish schools help to diminish the virus the children may only catch the infection from being brought into contact with infected cases at school, but they also carry it home to their families. The shutting of a school has to my knowledge markedly diminished the number of cases, while the reopening has caused a fresh outbreak.

Clinical History.

Incubation period, one day to seven in one of my cases, contact with a patient produced the symptoms of disease in under 24 hours. Reliable data are difficult to obtain as a person may be in contact with a diphtheric patient and then a day or two after be exposed to fresh infection and perhaps 5 or 7 days after the 1st exposure develop the disease. An incubation of two days is common even in cases under my notice.

Symptoms are as a rule of a septic type. The case of a child refuses food and Murray near the fire indicating chilliness is dull and occasionally vomits. The mother may notice the child had some difficulty, possibly pain in swallowing. On examination, the fauces are swollen and glazed looking, the glands under
the jaw may be somewhat enlarged this by no
means always. Temp. may be 100° - 103° if
pulse more frequent than in health. 100 - 110 in
children. By the second day, patches of creamy excre-
culate are seen on the tonsils, the uvula, and the
surrounding parts are swollen and oedematous.
The patches in a typical case rapidly coalesce and
form a large patch on each tonsil. The patch spreading over the uvula and soft
palate possibly to posterior pharynx. In ap-
ppearance the exudate is greyish or yellowish
and is firmly adherent to the subjacent tissue.
On removing a piece of the pseudo-membrane
a bleeding spongy what eroded looking surface
is seen which is soon covered with fresh
exudate; by this time a fulness under the jaws
may be noticed and on palpation the glands are
enlarged and tender. There may be a thin brown
acid discharge from the mouth indicating that
the posterior nares are invaded. The Child in this
case breathing with the mouth open. Swallowing
in many cases treated with serum at the end of
a week or so Convalescence sets in. The mem-
brane separating from the 5th to 7th day
Albumin was present in a mild degree in 3/4 of my Cases. The area being increased assidu-
The above is a description of a typical Case of
Moderate severity in a child.

Of typical forms I have seen the following:

1. A pearly membraneous form.

2. Where the membrane is continuous but more
   creamy and translucent than usual.

3. Where the case resembled a follicular Tonsilitis

**Laryngeal Type of Disease.**

This form may follow the faucial affection or begin
as a faucitis with looseness and a croupy

cough getting gradually but steadily worse es-
pecially at night. The difficulty of breathing is
usually paroxysmal and accompanied by Cyanosis.
The Diaphoresis then becomes continuous both inspiration
and expiration. The intercostal spaces are indrawn.

The child becomes restless and to sees about
in account of the Struggle for breath. In
Fatal Cases Stupor follows quickly, and the
death occurs from accumulation of Co2 in
the Blood. I have found the laryngeal type
much more fatal than the faucial or faucitous
cases. Sometimes during a paroxysm of dyspnoea
the membrane may be congested up. I have seen
this occur while meditating Tracheotomy. I gave
the credit of loosening the membrane to the
Serum which I had used freely.
Diphtheria of the Parts.

Is rare. Only on one occasion has diphtheria of the vulva come under my notice.

The case was that of a puerperal woman the membrane appearing on the 5th day of the puerperum; the case terminating fatally on the 10th day.

Complications. Locally. Have seen hemorrhage from the nose and in one case from the throat and in severe cases. Skin rashes may occur. Have occasionally seen diffuse erythema and in a fatal case purpura.

In the respiratory system broncho pneumonitis may here terminate a case it did so in one of the writers' hands under your care.

Renal complication is fairly common. All my lead cases had albuminuria, varying in amount from a trace to a positive. An acute nephritis may occur. In the latter, the urine is often a deep red color. The deposit under the microscope showing tubular granular, and blood the urine almost solid on boiling; the dropsey was not marked.

The larya is increased as a rule in diphtheria.

Sequelae. Paralysis. This is the most important and at the same time a common sequel in my adult cases differed, than did my juvenile cases. On two occasions the appearance of paralysis has brought people to my surgery. On inquiry I have discovered
that they were in bed for a few days with "laryn-
itis" a few weeks previously. The palate is
most frequently affected, the first complaint being
that fluids come down the nose when taking a
meal. There is also nasal irritation, and if the
constructors of pharynx are involved difficulty
in swallowing. On inspection one finds the
palate relaxed and motionless. Common sensation
is also diminished. Have seen squint and
loss of power of accommodation; also weakness
of legs along with loss of knee jerk. Have
seen this last combined with the palate affection.
Heart symptoms are by no means rare and are
to be dreaded. Have observed both brady cardia
and tachy cardia. The latter more often. It is the
dilatation and attacks of syncope during convul-
siveness that are so exasperating after getting
a case safely thru; a dangerous illness. The
pulse keeping up to 100 or more after the 2nd
week is a danger signal and on careful per-
cussion one may find dilatation present.
The pulse may be weak and irregular in beat
and force. Any sudden exertion or movement
may produce a fatal attack of heart failure.
Heart symptoms may be observed during the acme
of the disease:
Diagnosis. This may be most difficult in fact impossible until the Klebs' Loess for bacillus has been demonstrated. Conversely a well marked case cannot be confused with anything else. It is the first day or two that there is doubt between a follicular tonsillitis and a true diphtheria. As a guide in these cases, I find in follicular tonsillitis the small yellowish plaques are easier removed with a scalpel than in diphtheria. Also that several of these plaques in contrast to a patch is in favor of the follicular form. If the patch is firmly adherent and leaves a raw looking surface on removal look on the case as a diphtheria especially so if it spreads to the uvula and soft palate. In the doubtful cases take a swabbing (a piece of wire, a pledge of wool or a test-tube all sterilized are all that is necessary) and while sterilizations are being made isolate and carefully watch the progress of the disease. There is a tendency nowadays for some practitioners to regard all cases of the throat with exudation as diphtheria and to treat them as such. No doubt this is on the safe side, but I regard it as an extreme view. The rule I follow in doubtful cases is to isolate, take a swabbing for diagnosis and if a child under 2000 units of serum. In adults I don't use serum
Unless the case is proved to be diphtheria, my reason being that it is a more fatal disease in children and that mild cases in adults get quite well without any treatment. Other signs in favor of diphtheria would be a leuco cytopia, increased amount of urine to, albuminuria and a corresponding affection of the larynx. In laryngeal cases a progressive looseness with difficulty of breathing in a child makes as ominous a sign.

Simple sore throat often comes on suddenly. Sooner or later in laryngeal patches appear on the tonsils in the majority of cases. Prevalence of the disease in the immediate neighborhood would add weight in favor of a positive opinion.

**Prognosis.** (a) Age: the younger the child the more grave the case. (b) The earlier a case is seen and put under serum heat means the better the outlook. Serum to be successful must be used early. (c) Laryngeal Cases are more fatal.

(a) Extensive formation of membrane involving the nose and covering the palates makes the outlook grave. Rapid loss of strength, a frequent and irregular pulse, or an abnormally slow one with or subnormal temperature are bad signs. Vomiting coming on on the 5th to 7th day I regard as a fatal symptom.
The vomiting is not amenable to treatment and is a symptom of the manifestations of a profound toxic condition due to the toxins of the diphtheria bacillus. Drowsiness in a child is a back symptom. The danger of paralysis during convalescence, which in most instances comes on in the second or third week, should be explained to the attendants and relatives. Abundant albumin is of serious import.

Glandular cases also do well especially in adults. The prognosis in post-diphtheritic paralysis and paralytic poliomyelitis is good provided the heart musculature and respiration are not affected. Complete recovery is the rule.

**Treatment.** This should be general and local.

The patient should be isolated and if this is not possible a hospital is the proper place for him. The bed should be in an airy room facing south. If possible a fire is a necessity apart from keeping the room warm it helps greatly in ventilating it. A sheet may be hung over the door. Looked in 1:20 of the crude carbolic acid recently. I have used Lysol 1:100 as it is far pleasanter to work with and quite efficient. It also keeps the air of the room moist and in a measure anti-septic with the following...
Po. Carboolic acid 3 f
Oleum Eucalyptus 3 f
Turpentine 3 f. A tablespoon full of this in a pint of water kept simmering over a spirit-lamp—night and day.

The attendant should not mix with the other members of the house hold. The various articles used by the patient should not be allowed out of the room. The diet should be nutritious and as a rule fluid for the first week. Milk Soups broths, quin in small amounts often.

The case should be kept in bed for several days after the membrane has disappeared.

Serum Treatment: I begin by giving 2000 units, and if seen for the first time on the third day, give 2000 more 12 hours later, in very lead cases much larger doses must be given. In the repetition of the injection one must be guided by the effects in each case. My syringe is a Roux, it is easy to keep clean and can be boiled previous to use.

The serum should be injected slowly under the skin of the flanks or back. The lump caused by the serum is allowed to be gradually absorbed by the tissues not massaged away. In favorable cases the membrane separates earlier and
The patient feels easier after the serum is used. Certain by-effects of the serum should be remembered a diffuse erythema may appear 8 or more days after the injection. I have seen this; joint affections are rarer. They have not as yet come under my notice. A local abscess means a dirty needle. A friend of mine injects the serum deep into the buttock to avoid this. He says I cannot say I find this necessary so far. I have never had an abscess. The rule is to inject early, delay may mean a fatal issue. The later a case is seen the more serum is required and the concentrated sera are more expensive. In my experience serum treatment has no effect on post-diphtheritic paralysis. It does not diminish the percentage affected. I have used serum supplied by The Jenner Institute, Burroughs Wellcome, and Parke Davis. All are good. The cost is about 2/6 for 2000 units. Parke Davis is a little more. Burroughs Wellcome supply a vial containing a prophylactic dose of 800 units at 1/-. After use the syringe should be washed out with cold water. Hot water coagulates the serum and blocks the needle.
There is a rubber tube to connect the needle to the syringe, I don't use it, it is difficult to keep surgically clean and I don't find it necessary. I can see it is used in a child that one cannot keep still.

Prophecy: Immunization. I am in favor of this. I tried it first as an experiment in a house where I had two cases of diphtheria. Immunized a boy aged 2 years who had been sleeping with his nurse. The latter having developed the disease - Dosed 800 units 13 & W. every one in the house took the disease one after the other at intervals of about a week or 10 days, the baby escaping. 3 weeks after the 1st immunization I infected 800 units and he never was ill a day while the house was practically a hospital for more than two months since then I have used the serum as a prophylactic with success.

Local Treatment: Clean linen is the main thing. Use the following in most cases: Swabbing the throat gently every 2 or 3 hours when awake:

1. Acid Carbolic. My 20 or Toluiol 3%.
2. Turpentine 3%.
3. Alcohol absolute 3%.
also doing one or two douches with warm lotion of Boric acid 1:1000 or 1:2000. 2 to 4 times in the 24 hours. If the throat is very dry and the breath foul give an occasional douche of Peroxide of Hydrogen and Linseed meal equal parts. The peroxide without an alkali is apt to be painful on account of the acidity.

In nasal cases the nasal douche is most useful in keeping the parts clean. Using the same lotion. The children that will not submit to local treatment it is better to leave them alone as the fight that results is most exhausting to the child and trying to the attendant. Pieces of membrane and debris should be removed once. The treatment of heart complications is not very satisfactory. The child must be kept flat on his back the head pan insisted on all exciting influences avoided if possible such as too much talking and feet. The sitting up in bed may produce a fatal attack of Syncope (Case 5) alcohol and clumice and digitals are useless; quite young children bear digitals well. In paralysis of the palate or muscles of deglutition nasal feeding may be necessary a large rubber catheter is an excellent thing. The paralysis usually
occur in the second to the fourth week of the disease recovery is the rule.
Cases of diphtheria should be isolated for 6 weeks from the date of commencement. Contacts for a week or more if possible. The bedding and underclothes washed and soaked in 1.40 carbolic for a night. Toys and books burned. The room repapered. The mattress, clothes of the patient and attendant hung up in the room and fumigated with sulphur. The contact if it has not been lifted at the beginning of the illness should be worn if an old one. If new it should be hung out in the wind and sun light for many days and well beaten. When a death has occurred from the disease the body should be as quickly as possible placed in closely fitting coffin and as few people as possible attend the funeral. None should come to the house.

The following cases are described with a view of bringing out various points in the above description of the disease.

Case I. B. H. age 18. 10. 8. 92 felt unwell and complained of sore throat, did not sleep well and felt hot through the night. I saw him on the 11th. on examination the pulse was 90 Temp. 101
on looking at the throat the tonsils were observed to be swollen, there was a small patch on each yellowish white in color and firmly adherent. the uvula and soft palate were red and inflamed gently swabbing the patches did not remove them and when I removed a piece with a blunt piece of wood, a raw surface was left, bleeding from one or two points. The glands under the jaw were enlarged; by the evening the patches were larger and one had spread to the uvula. 2000 units of serum were injected at 11 AM. The urine showed a trace of albumin, was darker than usual Sp. 97. 10:20 a.m. 2.20 T. The general condition was poor. The bars took plenty of fluid nourishment and pain in swallowing was not a prominent symptom on the evening of the 4th day the membrane began to loosen and by the 7th day the throat was clear and patient convalescent recovery was uninterrupted there was no paralysis. The above is a short description of a typical mild case in a girl of 18. I think the membrane would probably have taken longer to separate if serum had not been used. I did not consider her case required more than the one injection of 2000
Case II. M.C., girl aged 10. On the 5th, 10:00 complained of shivering and sore throat. I saw her in the afternoon of the 6th (2nd day of disease) Pulse 110. Temp. 102°. She had not slept much the night and showed a good deal when asleep appetite fair. Skin dry and hot. On looking at the throat it appeared almost collapsed. The tonsils were swollen, the uvula pendulous, and redemptions on the right tonsil there was a yellowish white patch of exudation somewhat smaller than a 3d bit. Gentle swabbing did not remove it; the glands under the jaw were enlarged. The urine was high colored. I had some serum in my traps and at once injected 2000 units Parke Davis. In the evening I examined the urine. Sp. gr. 1025 acid, a trace of albumen, urea 2.7%. There was a deposit of urates but no blood or tubercles under the microscope.

3rd day. Membrane spreading rapidly, now on both tonsils, and also on uvula. General condition much as yesterday.

4th Day. The Tonsils covered with membrane also uvula and part of soft palate. Injected 2000 units P. Davis. Breath very foul, the child lying with her mouth open and snoring loudly. Temp. 102°, Pulse 115.
Had been painting the throat with acid, called M 20 Tinct. Feni per elixir. 3:0 glycerine and water 2:2:3. every 3 hours. I now gave the mouth a good douching with peroxide of Hydrogen and line water equal parts which the child took. The throat had become comfortable. Her strength was good and she was taking fluid food well. The voice and Thyroid seemed fine. 5:1/2 Day. I was called at 1 AM. on account of choking sensation. I found the uvula like a cherry and blocking any space that was left between the tonsils. grasping it with a forceps I made two deep incisions. Some blood and a good deal of Serum exuded and gave the child marked relief. The membrane was depauperate now, when I called at 10 AM. a large piece was washed off the left tonsil. The uvula was almost free from albumin Temp 100, pulse 90-100. By the 8th day the throat was clear Temp & pulse normal, a rapid recovery took place till during the 3rd week there was paralysis of the palate it only lasted 5 days however. There were some points of interest in this case. 1. The child suffered from Chronic enlargement of the tonsils 2. She also had adenoids. Both of these
Condition aggravated the symptoms, the adenoids blocking the posterior nares, and in the throat the enlarged tonsils and wound made respiration very difficult. The child also suffered from asthma but fortunately had no attack while suffering from diphtheria.

Case 3. T. H. boy aged 8, complained of sore throat on 13.1.13, but did not feel ill enough to go to bed. I was sent for as there was diphtheria at the same farm. Temp. 101.5°, pulse 100. The throat was inflamed looking but no spots of exudation could be seen. Suspecting diphtheria I injected 1,000 units (Borroughs & Wellcome). Under the skin of the back the urine on examination showed nothing abnormal. 2nd day there was a distinct patch on the left tonsil and by the evening there was a large patch on the right side. Injected 2,000 13.45. 3rd day Urine was scanty, dark and smoky looking the eye lids were a little puffy but no oedema to speak of elsewhere. I gave 5 gr. Calomel followed by a teaspoonful of Epsom and wrapped him in hot wet blankets, profuse sweating and 8 water motions followed. The urine showed blood and granular tubercles, albumen 2.16 gr. 12.00. The area diminished Sp. gr. 1.030. The throat much the same as 2nd day.
4th Day. The pulse was 100. Temp. 100.5. Membrane covered both tonsils, but by the evening was separating. The uric acid dark and contained blood. The diet was milk and barley water a tablespoonful of honey added. In last water was faint every morning for 3 days.


The renal condition now began to improve. on the 6th day, by the 8th day, the throat was clean of exudation. In 3 weeks there was still albumen. 875 g. 2 pm 03. I kept him in bed for 6 weeks altogether as in the 4th week there was paralysis of the soft palate and constriction of the pharynx. Liquids came down the nose and he also choked when feeding. I adopted nasal feeding with a No. 10 soft rubber catheter for 3 days, the child was quiet and did not object much to the procedure. There was at the time time loss of power in the legs especially in the extensors. Knee jerk was absent. The plantar reflex was present. At the end of the 6th week there was only a trace of albumen and the paralysis was gone.
he was up and out side by the 5th week.
In this case the diphtheria was out of a
serious state & seemed overshadowed by the
nephritis. In another case that came under
my notice. The nephritis became chronic
and persisted for more than two years.
There was a strong tubercular taint in the
family history and the boy's parents
were tuberculous.

Case 4. A. B. Girl 6 years old. She had been ill
3 days when I saw her. (Shepherd's child 12
miles off on the Lawmeroom Hills) on the
The child refused food and was continuously
vomiting. There was a profuse membrane over
tonsils and uvula. Tore up in the evening
and injected 8000 units Parke Davis, 10th.
4½ day condition unchanged injected 2000
5½ day. Vomiting had set in which would
not yield to treatment. The child lying in
a dull stupor. Condition & urine scanty
albumin 1.31 gms per 12. No blood or casts.
She gradually sank and died in the evening
of the 6½ day come along the membrane began
to separate in morning of the 6½ day. In
this case the child seemed over whelmed with

the fever from the beginning, the serum seemed to have no effect. The disease I traced to an old door sent by post more than 100 miles from the infected house. The difficulty of satisfactory treatment at a distance of 12 miles can be understood.

Case 5. T. A. C. aged 7 boys. On the 10. 10. 01. he vomited once all day and shivery no appetite also slight sore throat. I saw him on the 11th 2nd day. The throat showed 2 small patches on the back and 3 on left which could easily wipe away but rapidly reformed. Temp. 102.5 pulse 100 no albumen area. It looked just like a follicular tonsilitis. I was suspicious as there were other cases of diphtheria in the neighborhood so injected 2.000 units B. O. W. 3rd day Hoarse the same throat a Swallowing and on the 4th day. The report was "Sure diphtheria" it was also plain to me that was now a brown discharge from the nose which was blocked. General complaint was good, pulse 100 good volume and regular. Temp. 101.5. The boy sleeping well and taking liquids freely. On the 6th day I douched the nose and brought away large pieces of membrane. The boy was easy to deal with and liked the nasal douche after the 1st trial.
in the 7th day the throat was clean, the wound.
So about the 10th day the pulse become more
frequent the temp was normal. Careful
examination of heart revealed nothing. on the
14th day the glands on left side of neck were enlarged
and tender. 4 days later there was deep fluctuation
and I opened on a director a pocket of pus
about a table spoonful coming away a gauge
drain was inserted and a dressing of gauge.
Covered with Tarsnille applied changed daily
about the beginning of the 4th week the heart
have the much anxious. The pulse was 110 and
intermittent. On percussion delitation was evident
the apex beat was 2 in. External 15 mammary
line. A soft flowring systolicic murmur was
Audible in the mitral area and conducted towards
sinus. Absolute remembrance and use of bedpan
Aquasol 5 m. hs 3x per day. 2 m. every 4 hours
at the beginning of the 5th week the heart
condition was better. The pulse was more
regular and slower. The murmur was
Still present. one day during the 6th week I was
driving over to see the boy and the groom coming
for me. The boy was dead when I reached the
house. Sudden Syncope supervened when
he sat up to have his dinner.
Case 6. A. S., age 5, complained of hoarseness on 25th June. I was called in on the 3rd day as the child was getting worse. The child did not look very ill but was almost voiceless and had a croaky cough. Temp. 101°, pulse 100.

The throat showed a small patch on the left tonsil. Suspecting diphtheria. Called in the evening and found a patch on the right side. Injected 2000 units P.D. H.C. 4th day breathing was noisy but no indrawing of the intercostal spaces there was no increase in the size of the throat patches. General condition fair. Injected 2000 units. 5th day, child had had a bad night and was restless. Inspiration & expiration were laboured and noisy, the intercostal spaces were retracted. The child's color was good, however, and the pulse regular, at 5 p.m. The child seemed to be choking, and I was explaining the pros & cons of tracheotomy to the parents when a large piece of meat was coughed up with instant relief. The larynx never became filled up again and convalescence soon set in. There was Squint and loss of power of accommodation during the 4th week but this did not last more than 2 weeks, at the same time the knee jerk was
Case 7. A.C. boy. 14. Complained of sore throat on 21st Oct. 1921. It proved to be a typical case of the farinal type. All went well till on the 10th day he complained of pain in chest followed by deafness after 4 days. There was a discharge of pus. The otoscope showed a perforation of the membrane. The hearing was eventually completely restored. This is the only case of otitis media that I have seen so far as a complication of diphtheria.

Case 8. A.M. girl. 8. a severe case of the laryngeal type. She got steadily worse from day to day without effect of repeated injections of serum on the 6th morning. She was heard and in extremis, with the aid of a friend a tracheotomy was performed with immediate relief of the dyspnoea, but the child rapidly fell into a stupor and died in the evening. This last case brings up the question of tracheotomy. No doubt gives temporary relief and makes the end a more peaceful one in hopeless cases. I think the difficulty is to know when to do it. If done earlier perhaps more cases would be saved. People object to it, and if the child is hopelessly poisoned by the diphtheria it isn't worth while. I think many men leave it as a "desperate resort." It has to be undertaken under most difficult surroundings. Some times. No skilled assistance may be available and a candle all the light-
Procurement. In hospital and private practice in large towns matters are easier. Intubation I regard as out of the question except in hospital practice. At any moment the tube may be blocked and require removal. The successful introduction must also require considerable practice. If a tracheotomy tube becomes blocked anyone can clean it out with a feather. The Americans seem to have good results from Intubation.

Patrick D. Leighton
April 1903.