Thesis on Diphtheria
by Horace Nathaniel Herard
M.B. + C.M. Edin
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by

Horace Nathaniel Everard
M.B. & C.M. 1880
L.R.C.S. & A.M. & L.S.A.

Torneo

Transvaal

South Africa.

Definition.
An acute, specific, contagious, asthenic disease, sometimes epidemic and in certain localities endemic.

Characterized by the exudation of a plastic lymph in different situations, chiefly on such mucous surfaces as the tonsils, soft palate, uvula, pharynx, larynx and trachea; this plastic lymph consisting of a tough false membrane together with epithelial and mucous cells.
The false membrane is not confined to the above mentioned situations but may affect the vagina or other mucous membranes or any abraded surface.

**Etiology**

The exciting cause is a specific contagium. Whether diphtheria can originate de novo, or whether it must arise from the viruses of previous cases perhaps long dormant and forgotten, is in my opinion still very doubtful. I think it is mostly believed that it does not arise de novo, but have come under my observation where I can trace no origin from any previous diphtheria. In January of 1892 I was called upon to attend a family living on an isolated farm, which farm we may call "A," three of the family were suffering from diphtheria. There had certainly been no case of diphtheria in this house before and none of the members of
The family had had diphtheria at any
time previously and there was no
diphtheria in the neighborhood at that
time, but during the next week a case
broke out on a farm 24 miles away
from the farm A; this latter farm we
may call "B." There had been no
communication at all between
the members of these two families.
Within a day or two a case broke
out on a farm "C" which is just close
to either of the two previously men-
tioned farms "A" and "B" than 27 miles.
And in this case also there had been
no communication between the
members of this family and the members
of the families living on A and B.
These 3 families were attacked within
the space of two weeks, all were at
least 24 miles apart and in no
case was there any telecommunication
direct or indirect.
Now it is not in my opinion possible
to account for these cases by supposing
the contagium was carried by water.
as one farm is situated on the Komati Watershed and another of the farms on the Vaal River Watershed, nor do I think it possible that it could have been carried by the air. Once the farms are so far distant from each other and are not situated in a line but in the form of a triangle. I cannot account for the cause of the outbreak in these families other than by supposing that the case of the cholera can arise de novo. When the circumstances are favourable, which they undoubtedly were in these cases, as the rainfall had been very heavy for the previous two months and the floors of the houses were damp all being mud floors, the huts are all draughty badly built and in a condition far from clean.

Although we are here in the Zululand district situated on a high plateau from 5400 feet to 6500 feet above the sea level and in many respects the climate very healthy, yet there are several circumstances favouring the
Development of Diphtheria; in August, September, and October. We often have a cold east wind with a thick, misty rain during which time quinsy is very prevalent, and consequently chronic enlargement of the tonsils is common, even in young children. Diphtheria is most common in early life, tend age being a great predisposing cause probably because the mucous membranes of the mouth and pharynx are soft and more succulent and also frequently the seat of congestion and inflammatory processes. The nasal cavities are frequently affected by catarrh, and the mouth by stomatitis. These conditions of the mucous membranes form a suitable nidus for the diphtheritic poison. It has been shown that the lymphatics in and around the tonsils in children are numerous and large and can be more easily injected in the child than in the adult. These conditions must facilitate the development of the poison.

Dr. Shorne Shorne in his Melrose Lecture
Says that the relative number of deaths per 100,000 at various ages is:
1st year is 43; 1 to 2 years is 70;
2 to 3 years is 64; 3 to 4 years is 70;
4 to 5 years is 64; 5 to 10 years is 34;
10 to 15 years is 11.
From the above figures there is a fair immunity from death during the first year of life which may be and probably is caused by the fact that the child being fed at the breast or by means of the preparations which are the product of manufacture are not likely to convey the deathly taint of poison.

Besides age we have another cause in the family or individual predisposition; I have often observed that those more exposed to the contagion frequently escape altogether; and during epidemics some families are attacked while others escape altogether, though more exposed to the contagion.

Poverty, filth, vitiated atmosphere re-
Vende. Individual more susceptible to the poison. Here in the district of Rome where Poverty is unknown and the poorest have enough to eat, and all live an outdoor existence and Anemia is scarcely met with. Diphtheria is common and the mortality very heavy; the reason I think is the want of cleanliness, absence of sunlight in houses and damp floors together with a great prevalence of acute and chronic tonsilitis and especially tonsilitis amongst children. The houses are built with low and shallow foundations which are simply filled up with soil, so that any dampness of the ground outside the house easily finds its way under the shallow foundation into the cellars which forms the floor of the house, its will account for the prevalence of chronic enlarged tonsils and acute tonsilitis. The windows and doors fit badly and consequently the houses are draughty; the windows are very small and what little light might enter is stopped
by various hangings so that the rooms are always very dark, and add to this that the houses are seldom or never swept out and the bodies and clothes of the inmates almost never washed. Here we have no delivery of cold people from which pyorrhea,expectations can arise and no closet in the place of the latter. The open country being used, this no doubt keeps very primitive but civilization is not very far amongst the Boers. Aphthena is worse here in wet seasons, that is during the summer; in the winter, when for 4 or 5 months we get absolutely no rain and a sharp frost every night or soon as the sun sets, aphthena does not break out, cannot call to mind a single case of it during the winter months. This seems to me a strong indication that the aphthenic poison cannot exist or at all exist in dormant during the months of dryness and frost. Since composing my thesis we have had for five months a rainfall which has never before been experienced.
and within the last month Aephtrena of a malignant type with consequently a heavy mortality has broken out in the Orange Free State and in the Transvaal especially in the high districts of Standerton, Senekal and Waterval East. Dr. Charles Kelly finds the mortality from Aephtrena is much higher on wet and selective soils than on dry and non-selective ones. Dr. Thorne Thorne in his Milroy lecture says he is inclined to regard a moving body of water as in the alluvial beds of flowing rivers as much less likely to act as a predisposing cause of Aephtrena than are stagnant sheets lying in pockets and hollows of gravel and sand. Dr. Arai points out the great cycles of life in the mortality which the fourth grade of the Ipa constantly has over the third grade, and this is referred to, as lending support to the theory that the Malaria age is an organism with seasonal development attaining its chief reproductive phase in the autumn, the very season when the air is known to be especially charged with fungoid forms.
He goes on to state that the annual average is as follows:

1st Quarter - 903; 2nd Quarter - 713; 3rd Quarter - 732; 4th Quarter - 1025.

Dr. Bruce Jow orderly into the Circumstances leading to an insidious death record from Diphtheria and it soon became evident that Diphtheria as a registered cause of death was not alone in the question; there were concurrently many deaths registered from Croup, Laryngitis, Tracheitis, etc. Not only were these deaths concurrent in point of time with the deaths from diphtheria increasing and decreasing in number throughout the 10 years with the increase and decrease free of death from diphtheria, but they were concurrent in the same localities in town and country and concurrent often in the same families and homes.

Dr. Thorne reminds us that if the Contagia of the acute specific diseases do belong to the vegetable world, he knows of no proof for refusing to believe that organisms capable of producing a similar and an
uncommunicable disease in particular.

Stage of their growth & in the course of
their subsequent development or in the
stage of their growth become capable of
producing a major disease Commu-
nicable from person to person, the affair
being essentially one of soil. This is may
the production by means of a process
of evolution of that which gives to an
already existing organism that pro-
perty by which it becomes infectious.

Dr. David Page states that an outbreak
of diphtheria is often preceded for a month
or so by a series of ordinary sore throats
which gradually work up to charac-
teristic diphtheria.

McIntosh also refers to the progressive
development of sore throat into diphtheria
B. Klein in an address before the Royal
Institution in 1891 says that the bacilli
of diphtheria is killed when kept for a
few days in pure water, on account of
not finding sufficient-nutrient.

I have quoted the above authorities, as
I think their remarks are well borne out
here; we find diphtheria prevalent at
The same time as tercelitis vy in the summer, when we get rain and not
in the winter during the five months drought.
The subsoil here is a blue tenacious clay
and imperious. And the topsoil is a loam
quite porous, the houses have mud floors
and are generally damp when the outside
dirt is damp. I have frequently dug a
hole in the ground and find it soon fills
with water, which is stagnant and cannot
percolate through the claggy subsoil,
and this is exactly the condition which
Dr. Thorne Thorne in his Medical Lectures
renders to favour the development of disease.
Dr. Wm. Taylor made an interesting observa-
tion which he published in the B.M. Journal
July 1881: "On the fungoid origin of this disease." He describes an outbreak in a house pre-
viously healthy where a wale spoke had
lately broken and after a great rainfall
the outside wall of bedroom became
saturated and wale, dripped into paper
the flue. On the wall became sodden.
There were eruptions of Zanci Zorning
from the passage wall. The surface
of wall in the bedroom were covered
With a fine filamentous, gelatinous, yellowish mold and other fungous growth. In this case the drains were in good order, and there was no suspicion as to the milk supply nor to the water; there was no prevalence of the disease in the town from any noticeable source, through which infection could have been contracted, nor was it a delphetic house, no change had visited the house for residence for some time nor had the children been visiting elsewhere for months. In this case there can be no doubt the cause was dampness that is wetness of subsoil dependent on the presence of clay and blinding pluvial wall, in the vicinity of the late as well as dampness in the walls. He was on Dr. sue that dampness was the predisposing cause but that the specific cause was due to some fumes which were bred on the surface of the wall. He subsequently stated that if dampness were the cause then Why did the delphetic break out in a day or two after the rooms became damp, instead of in 17 to 20 days, for the period of incubation
In diphtheria it is short—viz. from 2 to 4 days, but on the contrary, due to the products of putrefaction it would not be until a week or 10 days after the accident happened to the wall, that the specific agency or virus or disease-producing particle were properly ripe or sufficiently numerous to effuse throughout the atmosphere to determine the nature's influence.

Osthol in Germany, Selvatic in France and Burdon-Henderson have shown that diphtheria is a true septicemia or infection of living tissue with micrococci and that the development of these minute organisms is intimately associated with the morbid process. It has been found that the pseudomembrane consists of layers of stratified epithelium more or less mingled with products of suppuration from blood plasma and some micrococci but that in the mucous and submucous tissues the channels communicating with the lymphatics are filled with granules of Malté, which is mainly micrococci or masses of vegetation; so that diphtheria has tended to establish a certain analogy.
In the mortality proceedings of diphtheria with those in epidemic fever, cholera, dysentery, chicken cholera, and helminth diseases.

Dr. Taylor's remarks are well borne out by the evidence of Dr. Mayo Robinson in the B.M. Journal July 1857. Where no cause could be found at all for a case of diphtheria except that in the breakfast room, the walls and ceiling of two cups-board were covered with dead dust, which proved to be a species of fungus, this had only been noticed a few weeks previous.

This was caused by a dampness due to the rain water pipe in the new house having burst and saturated the earth contiguous to the wall of the street.

Another point that is worthy of mention is the possibility of the contagion being carried by flies; this is not altogether a matter of small importance as we know that cholera can certainly be spread by flies.

And this was Morris quite a case somewhere, I cannot now recall where I read his statement, that a dead dog was thrown into a ditch and
Soon became covered with fleas and then shortly followed an epidemic of anthrax. This danger may be avoided by thoroughly disinfecting all discharges and from the patient. So I think we can sum up the causes of diphtheria thus.

1. Age, youth tending much more to the disease than ripe age.

2. Individual predisposition.

3. Family predisposition; during a late epidemic of diphtheria in Dallas it broke out in a family destroying the father and 3 children, only the mother surviving.

4. Having had the disease previously.

5. Season of the year, it being more prevalent during the wet season, that is the summer in this County and the winter and autumn in England, that being the time when cutaneous disorders are most frequent.

6. Unhealthy surroundings such as damp floors, walls, draughty houses, filth which includes filthy bodies, clothes, dirty habits.
and a vitiated atmosphere whether
simply from overcrowded rooms or
from poisonous gases
or contamination from rioting or pre-
riot interference.

8 Any condition of health which
lends to lower the standard of
vitality

Manner of Infection
Diphtheria is communicable by con-
tact, perspiration and inoculation; sometime
the origin of the case is purely local
as in infection of a wound, sometime
constitutional, the latter beginning
with high fever, there may be no local
symptoms, great depression, delirium
and in some cases death. Two years
ago I was called in to attend a child
of nearly two years of age. I found her
profoundly ill, with high fever and
cough and within 12 hours she died.
I could find no indications to lead
to a diagnosis; all the other members
of the family were apparently in good
health. The parents were anxious to
know the cause of death. I assured
Then the Child had succumbed to acute disease in its first stage and before there was time for any diagnostic symptoms to be developed, but that it was probably a case of diphtheritic poisoning. Within a week an older child thickened and went through a severe attack of diphtheria, but with ultimate recovery, thus pointing to the great probability that the first child had died of constitutional diphtheria. It is not difficult to realize how there may be a general blood poisoning without any local manifestation of diphtheria. On considering how an atmosphere containing diphtheritic germs may be inhaled and brought into contact with the vast amount of blood in the lungs and only separated from it by the thin epithelial layer of the alveoli of the lungs and basement membrane and the coat of the fine capillaries.

Contagion and Incubation: Diphtheria is undoubtedly contagious. Even after the lapse of long periods, a
the fumes may cling to clothing or the surroundings; the expectoration may dry and yet the fumes may be carried by the air and infect after long periods of time. Utensils used by the patient such as spoons cups etc. also handkerchiefs towels etc. may readily be a source of contagion. There can be no doubt that the contagion power of diphtheria is increased by bad ventilation and vice versa.

The period of incubation varies probably according to the condition of the health of the patient and according to his surroundings, but in any case it is probably not more than 4 days. In the case of tracheotomy where the operator has touched the wound the disease generally makes its appearance on the 2nd or 3rd day.

Jacobi quotes a case of a girl returning to school suffering from diphtheritic ophthalmia and on the 3rd day several children were complaining of headache and sore throat and on the 4th day or many were sick that the school had to
be closed.

Symptoms.

are general and local and vary according
to the severity of the attack, there being local
manifestations of the general specific
disease, in the formation of false membrane
sometimes on tonsils, pharynx, soft palate
nasal cavities, and may pass from
nasal cavities through the nasal duct to
the conjunctiva, and in the same manner
the internal ear may be affected through
the Eustachian tube; the membrane may
extend into the respiratory organs by
the epiglottis, larynx, trachea.
The esophagus and cardinal and sternal
are sometimes affected. I have already
referred to the injection of wounds by the
abdominal membrane.

The disease generally commences with
increase in temperature, fits or more or
less severe and debility, this latter
symptom is very constant, varying
in intensity, sometimes the prostration
to be severe that patients succumb in
the early stage before late symptoms
have time to develop. Any nice of
Temperature with great prostration would at once lead one to suspect that it may be the onset of diphtheria, even if no other symptoms are present as in the case quoted on page 17; if the patient survives the early stage, there will be an exudation of false membrane commencing almost always on the tonsils or pharynx and spreading from there to the various situations above referred to.

An early symptom often observed is an alteration in the voice, more especially distressible when coughing, caused by congestion and œdema of tonsils, faucets, throat, and false membrane scattered over the tonsils, there appears, grow rapidly and unite and form a dull opaque tongue covering the glands under the jaws are swollen and tender. There is now generally dysphagia. At about this time one can generally detect albumin in the urine though it may not be present until a much later stage. The cause of this very constant symptom may be from affection of the
Kidneys. When we find granular cells, hyaline casts, and epithelial casts, or it may simply be from the blood poisoning and tissue waste. It is suggested that the excess of food beyond the power of assimilation will be far accounted for the presence of albumen in the urine and naturally this would also account for the intermittent character of the urine.

Sometimes in the early stage of diphtheria, there may be an erythematous eruption on chest, shoulders, back, and occasionally all over the body, this pointing to an affinity between diphtheria and syphilis and Chabaul's.

In mild cases the disease may end here, and a gradual convalescence be established. But it may grow in intensity, the membrane extending, temperature rising, difficulty in swallowing increasing, hemorrhage perhaps occur from the throat, nose or other effects. Pulse becomes feeble, and there is great prostration or the false membrane may extend into the...
larynx; or any of the many complications of diphtheria may arise and cause death; these complications will now be discussed.

Temperature may vary from subnormal in cases when there is great prostration, to 103, 104, 106 or even higher; a high temperature indicates great danger. The false membrane may extend into the larynx, when there is always great danger; the breathing becomes stridulous, and the voice and cough and cry assume a hoarse harsh character, which when once heard can always be recognized. As a rule this becomes rapidly worse, the breathing becomes oppressed, the patient struggling for breath; there is evidently great obstruction to the entrance of air into the lungs, the subcostal notch, intercostal space, and suprasternal notch being drawn in. This distress is intermittent and after a time of perhaps 10 minutes or so the dyspnoea becomes less, though only for a time when it returns again, and so it goes on to exhaustion and death unless relief is obtained; during this
dyspnea. There is hoarseness and cyanosis, purplish lips, feeble intermittent pulse, stupor and collapse. The duration of diphtheria after the disease attacks, the larynx is generally very short and may be only a few hours or may go on for one or two days. It is possible however that recovery may take place if the deposit of false membrane is limited.

Other complications of diphtheria arise from the formation of false membrane in unusual situations as referred to on page 27. There may be pneumonia, pericarditis, endocarditis, or formation of thrombus in the heart or vessels, all of which are serious complications and may in themselves cause death or may greatly lessen the chances of recovery. Another not uncommon complication is diphtheritic paralysis which may manifest itself in almost any situation. The usual period for these paralysis to come on is during convalescence and may be any time from a week to a month or
5 weeks usually however it is during the first nine days after recovery. The prognosis of diphtheritic paralysis. is good. There seems to be a natural tendency to recovery but it may end fatally as in paralysis of the heart, or pharynx or diaphragm, and failure of respiration. The rapidity with which recovery takes place is very variable and may extend from 2 to 3 weeks to months. Sometimes during the acute stage of diphtheria we find the velum palati affected also the oropharynx and pharynx, i.e. the palate. The difficulty in swallowing or coughing may be caused by the food coming into contact with the mucous membrane of the upper part of the larynx and is always a serious complication. This is caused by paralysis of the velum palati.

The muscles of the face may be so affected that there is no expression and the patient is not able to laugh, talk, or cry.
Extremities may be paralyzed. Also paralysis of the muscles of the bladder, intestine, may give rise to various complications.

But I think the more frequent paralysis is that connected with the epiglottis which may cause dysphonia, loss of coordination, amblyopia, myopia, diplopia etc.

Diagnosis:

As a rule the diagnosis is not difficult but in some cases where the patient succumbs before the development of the false membrane, or when the incubation is slow and insidious, it may be difficult to form an opinion. But if there is a rise in temperature, redness of throat and faucæ, enlargement of cervical glands with weakness and depression out of proportion to the local symptoms and especially if there is diptheria in the neighborhood or is known to be prevalent, then one may feel fairly certain that it is a case of diptheria. When the symptoms are well marked there cannot be much doubt.
The redness of throat and surrounding parts, the presence of a dull brownish grey, rough membrane with enlarged glands cannot be mistaken for larynx. One may be undecided whether it is a case of laryngeal diphtheria or Stridulous laryngitis but the invasion is more sudden in the latter. And the dyspnoea is intense from the commencement and not gradually increasing as in laryngeal diphtheria. There is also no enlargement of the sub-mandibular glands in Stridulous Laryngitis. If a child is under one year of age it is probably a case of false Cory.

**Prognosis**

Diphtheria is a more dangerous disease and one must always give a very guarded opinion even in mild cases. As at any time the diphtheritic inflammation may spread to the larynx or other complications arise up. However, one may judge approximately from the severity of the epidemic; also the older the child the better is the chance of recovery.
Treatment

Diphtheria requires a much thought and care on the part of the medical attendant as well as the nurse as any disease can call for; he must give as much attention to the dietetic and hygienic treatment as the medicine. There is no specific treatment but each case must be handled on its own merit. Reduce high fevers, treat collapse, attend carefully to nourishment of patient and treat any complications early.

We must bear in mind that prevention is better than cure and must therefore see that all the members of the family are in a healthy condition, any catarrhal, enlarged tonsils, cataracts must be treated once looked to; I have found Chlorate of Potash and glycerine to be very useful in cases of catarrh and congestion of tonsils and even in diphtheria itself it is useful in relieving the accompanying pharyngitis and pharyngitis, which is a great point as the disease is not likely to extend if the surrounding parts are in a healthy condition.
Jacob states that in cases where the inflammation is limited to the tonsils, there is not so much danger for the lymphatic communication between the tonsils and the rest of the body is very trifling, thus little or no absorption from a tonsillar disease, it will occur. See that there is plenty of ventilation but no draught, for they cannot be a doubt that the diphteretic poison in common with many other poisons is not nearly so liable to attack one who is diluted with fresh air.

Remove the patient to top closer, once the poison is carried up by the warm currents of air. Have all the excreta carefully disinfected with carbolic or the effective disinfectant. Remove all clothing, bedding, towels, etc. And have them at once disinfected also the utensils used by the patient must not be used by other members of family. Healthy children must be kept away from the sick room.

Throughout the diet must be sustaining. And nutritive, it is often difficult to
for a child to take anything else we should do all that can be done to persuade the child to take frequently small quantities of milk, chicken broth or beef tea. If the child absolutely refuses we must not force the food. It is better to give a small portion of beef tea and brandy.

Corrigan recommends that pepperine be given with the food in the form of pepperined pills of powdered raw beef with a few teaspoonfuls of the expressed juice of raw beef. Beat up an egg with half a small cupful of milk and two teaspoonfuls of more of brandy and this may be added a small or two of pepperine powder.

Find milk and very strong chicken broth to be the best diet, and if it can be taken then a small fillet of raw beef. Milk is often swallowed more easily when thickened with flour or marjoram. A very important part of the treatment is the administration of stimulants in some form or other, and a very suitable
Preparation for infants. In white wine or th.
The pulse must be watched and if not and comparatively or the
fortable depressed one must not hesitate in administering stimulants,
and even if from the commencement it is seen that the attack will be severe
I should advise no delay in beginning with stimulants. In some cases we
meet with severe vomiting that brandy cannot be tolerated, when we should try
to stop the nausea with Carbonate of Baryta
or Aluminate of Cerium. The Carbonate is
sometime useful in one or two drops
made up with brandy and put in a
pill; apple, also mustard or turmeric
to the eyegatium or bit prallice.
There is no specific remedy but from my
experience I believe much may be done
with drugs. Dulcey unless there are
decided contra indications commence
the treatment with a purgative generally
Carbon or grain powde. To eliminate as
much poison as possible by the intestinal
Canal and when the Barders how much
Brandy must be swallowed in the Cerum
It seems to be very rational to administer a purge. I then prescribe a mixture of perchloride of iron with guinine, jyane, and wale. To a child of five years of age I give 15 drops of the perchloride of iron with 1 grain of guinine and 10 minutes of perchloride of mercury and 20 minutes of jyane in a clear potful of wale, etc. stuff. An enema may be preferable to eject false membranes, but if there be much protrusion it seems that more man will be done than good, as already the patient's strength is exhausted and one cannot afford to make further calls on it by inducing nausea vomiting. I think jyane are the best emetics, and sulphate of zinc and arseneous wine are the best emetics; tallow emetic is very dangerous. Owing to its depressor effect, sulphate of copper may act as an irritant and cause diaphoresis. In many cases after vomiting has taken place it cannot be good treatment to persevere with further emesis. There have been many alleged specifics, such as mercury, bromine, sulphate of bismuth and balsams of Spain.
And Cuba, but it is difficult. To see how they act. And it is not one of those things that they are practically of little value.

If there are any signs of approaching cardiac failure, give digitalis or strychnia, with some stimulant such as caffé bitalize, or what I generally use is the chlorinated solution of soda. From the nature of diphtheria one is led to suppose that much good should come from general antiseptics, and I have undoubtedly been great benefit from perchloride of mercury solution and sulpho-saloliate of soda.

But whatever, internal treatment is adopted one must avoid any cardiac or general depressant.

Local Remedies. From my experience in South Africa where we meet with much diphtheria I have learnt more greatly on topical treatment and do not hesitate in saying that a good many cases would have ended fatally had it not been for local treatment.
non-specific coppe. Compare aphthisis with malignant pestle and insist that local treatment is a necessary in the former as in the latter. The old treatment of cauterization is decided by harmful and materially lessens the patient's chance of recovery. Sometimes use lactic acid as a solvent and gently apply it with a piece of flat wrapped round a pen holder, to the affected parts. Sometimes I find it easier done in the form of a spray.

A remedy often used and cannot be thought it has done much good is a gale of half a drachm of Chloral solution of soda and one drachm of glycerine in an ounce of water.

Mr. Mosca strongly recommends the use of alcoholized Carotic acid 1 part of acid to 3 parts of alcohol.

Mr. Hemming speaks highly of Gigants of Chloral Hydrate 25 grains to one ounce. This should be employed every hour or two.

It is remarkable that it rapidly gets rid of the fever and lessens the membrane which comes away leaving a healthy
Sulphur, Underneath.
The above are the chief antiseptics. Which have been, and are now, used, though many others are employed. It is very agreeable to the patient. Such ice, it relieves the heat and angry of the throat and alleviates the dysphagia.
A saline treatment, which died, adds to the comfort and safety of the patient. Steam inhalation to which usually add some toilette.
More warmth applied externally to the throat relieves the patient greatly, and lessens the fever, which is a great factor in the dyspnoea.
With reference to the use of Chlorate of Potash, it is not always advisable to administer it and in any case it is better given in small doses and frequently. Jacob recommends that the dose, be so frequently repeated that the remedy is almost always in contact with the diseased surface, so that if the daily dose is 20 grains it should be given in 50 or 60 small doses, and
36.

Milk in 8 or 10. But if there is any
Gastric Catarrh. Chlorate of Potash is
not well tolerated.

Diphtheria may have a local origin
often on the fauces from which
Starting place as in Malignant
Pustule or the ulcer in Preaural
Conditions arise. The general constitu-
tional disease, and therefore we are
forced to recognize that local dis-
section must be adopted. Carbolic
Acid Solution may be used with
the alonee. And the sprays may be
directed or to the Ears' every 10 or 15
Minutes. Steam soften the mem-
brane and also increase the secretion
thus helping the patient in their off
the Superficial membrane.

Jacobi and MacKenzie both strongly
recommend the employment of lime
Wate and Glycoine as otowee of
the false membrane. They recommend
equal parts of both to be used as a
Spray with the alonee.

Carbolic Acid Solution destroys bac-
teria and Check Prolapse, so that
In the case of the false membrane it must act destructively on the diphtheritic germ and proliferating epithelialia and cells which go to form the membrane. It is sometimes employed internally in small frequent doses as much as from 8 to 30 grains being given in the day, but of the internal use of Carbolic Acid I can not speak personally.

But in all local treatment we must be careful to do no damage to the surrounding mucous membrane, thereby rendering it more liable to be attacked by the diphtheritic poison. In diphtheria of the nasal cavities we must thoroughly disinfect them with Carbolic Acid Solution of about 2 to 4 grains to the ounce of water; the cavities being injected every hour or still more frequently.

As regards the treatment of diphtheritic paralysis we must have patience, there seems like a natural tendency to recovery, but much may be done by restoring the natural health of the patient.
And provided nutrition; treat any dyspepsia and if anaemic give some iron preparations. Plenty of open air, Strophine and arsenic in small doses are often very serviceable.

Local stimulation does certainly help to restore impaired circulation. We may use chamomile with compost soap or camphor liniment. Blisters may be used, though I prefer mild, Remedies; sea baths and sea air are also indicated. Salvarsan is often very useful especially in cardiac paralysis.

If in spite of all treatment we find that the disease has extended into the lungs and there is danger of asphyxia and that we are unable to lessen the mechanical impediment then we must think of tracheotomy. By making the opening into the trachea, below the line of obstruction, we allow the entrance of air into the lungs. The relief is immediate and may be permanent leading to recovery, only temporarily on account of the destruction
of the disease below the Seat of Operation. Moreover, we must consider the chance and if the obstruction has not extended below the Point where tracheotomy performed, it ought to be done. There is no doubt that many lives have been saved by opening the Track, and if all the remedies have failed the patient should be given this chance, though no aphthous ulcer is a favourable subject for operation.

Ernest L. A. R. Väre W. D. March 14th 1894 M.B. C.M.

Witness to Signature

[Signatures]

Wm. G. 

Eun. A. C.