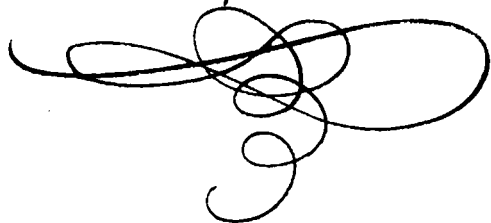


Some Remarks  
on the  
Etiology & Treatment  
of  
Diphtheria.



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# Contents. Page

I Introduction 1 - 4

II Etiology, Definition of 4

1) Predisposing Causes

1 Definition of - 5

2 Age 5

3 Sex - 5

4. Hereditary constitution  
+ idiosyncrasies } 5

5. General debilitating cause 7

6 Sanitation

(a) Simply predisposing? 8

(b) Prevailing atmospheric conditions. 9-11

(c) Physical conformation of district. 11

(d) Sanitary condition of houses &c. 11-15

(e) Previous prevalent diseases. 15-16

(f) Can it be developed from simple  
catarrh? ... } 16

(2) Exciting Cause

1 Definition of - 17

2 Specific nature of - 17-18

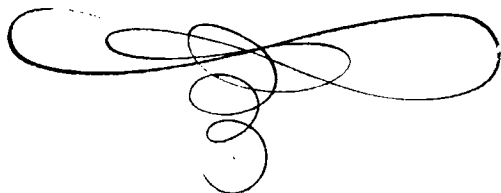
3 Inflammatory? 18-19

+ Parasitic? 19.

	Page
5 Contagious?	20-22
6 Infectious?	22-27.
7 Inoculable?	27-28.

### III Treatment -

	Remarks.	
		— 29
(1) Prophylactic		29-31
(a) Isolation		— 30
(b) Sanitation		30-31
(c) Drugs		— 31
(2) Acute Stage,	Remarks,	33
(a) American		— 34-36
(b) German		— 36
(c) French.		— 37-38
(d) English		— 38
(e) Own -		— 39-43
(f) Tracheotomy.		— 43-45
(3) Convalescence		— 46-47.



# Some Remarks on the Etiology & Treatment of Diphtheria.



Gentlemen,

The subject which I have selected for my Thesis, is one which has already been so clearly recognised and ably described by various eminent writers, that it may seem presumptuous on my part to add anything to the testimony of these distinguished men. However much we admire the genius & ability of our Superiors in the profession, whether as teachers or investigators of disease, it does not necessarily follow that we give a blind adherence to their views, or accept their doctrines so absolutely as to place  
them

them beyond the pale of criticism. My object in the present paper, then, is not so much to lay before you a brilliant series of hypothetical theories, however novel or original they may be, as to state in as plain, precise, & intelligent a manner as I can, some practical observations gathered in the hard field of daily practice, & to compare my own experience with the commonly accepted teaching of this disease.

If I appear to be a little opinionative or dogmatic in some of my views, it is not that I wish to be contradictory, or to indulge in mere speculation, but rather to record the result of careful enquiry which forces itself on my mind as a well-defined and established truth.

Much has been written, experiments of a delicate & dangerous nature have been made, science has been brought to bear in the investigation & research,

and

and yet we must admit we are still far from having reached the goal of our ambition in coping with this terrible scourge. -

My duties as Medical Officer of Health, together with an experience of several Years during epidemics of different degrees of severity, afford me favourable opportunities and abundant material for an intimate study of this disease in its various aspects. While not professing to add to the literature of the Subject, I hope to be able to shew how, with an intelligent & Common-sense view of its Causation & Treatment, we may be able, <sup>either</sup> to prevent it altogether, or guide our patient safely through its Course; & in the malignant form, when a favourable issue is not to be expected, we may to some extent mitigate the sufferings & alleviate the departure of unfortunate humanity.

Such then is my apology for  
Choosing

choosing as my dissertation, "The Etiology & Treatment of Diphtheria."

Etiology:— It is of the utmost importance that the Causes or agencies by which any disease is generated or brought about should be clearly & fully ascertained before we can hope to successfully combat their incursions upon health.

This general rule, applicable to all cases, is specially so in Diphtheria, where a just and early recognition of its primary factors, together with prompt and decided action on the part of the Physician, may be the means of averting what might become a public calamity, or of so circumscribing its limits that its progress might be soon arrested and it ultimately exterminated. —

• The Causes of Diphtheria may be



be looked upon as Predisposing & Exciting; the former having been in operation before the disease appears, rendering the person unable to resist the influences of the exciting cause, & so favouring its spread and development. —

It is sometimes difficult to draw the line between these two, as each writer will place the one or the other in either class, according as it does or does not suit his theory. —

Glancing briefly at these usually recognised <sup>causes</sup> <sup>under</sup> this head, I find that Age plays not an unimportant part. From statistics of 30 cases of my own — 20 are those of children under 8 years; of these 15 ranged from 3 to 6 years, and one case 2 years old. —

Females too — notably young girls — seem more susceptible to its influence.

Diphtheria — Its Symptoms  
& Treatment by W. Jenner Esq.

6

Hereditary tendencies & individual idiosyncrasies are of some consequence.

It is undoubtedly more prone to occur in some families than others. Sir W<sup>m</sup> Jenner believes that a tendency to a ready reception of the disorder may be an inherited Constitutional tendency; he even goes further and says - that of the two Conditions for developing the disease - Complete exposure to the Contagious principle and predisposition on the part of those receiving it - the latter is by far the most important. This is a very strong assertion and one which I will not contradict, as I have found whole members of a family prostrate with a severe type, including some of its Grave Complications, while their nearest-neighbours may be suffering from sore throat, mild as a simple catarrh. I fail, however, to see how this can be held to apply so specially to Diphtheria; as in my feeble judgment

it

it holds equally good in all the Zymotic diseases! —

Again, as in the Exanthemata, we find different members of the same family affected in different degrees of severity — —

All Causes which tend to debility  
& lower the vitality of the Subject from the healthy standard must be included in our list. —

The poor, raked, half-starved out-casts, exposed to the tender mercies of storm & tempest are too often found in this category. It seems to identify itself, in a marked degree, with poverty, wretchedness and filth.

Coming now to Sanitation I feel myself treading on very debatable ground. —

It is generally conceded that neglect of the common laws of health, with unfavourable hygienic surroundings, conduce to the  
propagation

propagation of Diphtheria and its allied class. - But then the question arises, Are these merely predisposing Causes? or are they something more? Are they capable, under certain favourable Conditions, of generating the disease itself, *de novo*? This vexed question, ably fought out by Dr<sup>s</sup> Murchison and Budd concerning the Exanthemata, is as yet only vaguely answered regarding this affection, altho' good grounds and solid arguments may be adduced by advocates of either side in favour of their respective views. My own Conclusions, for reasons later assigned, may be stated thus - that however favourable these Conditions may be to the Growth & Spread of diphtheria, they are only secondary & subordinate to the active principle or *materies morbi*; in short, they only form a suitable & congenial soil for the

the development and propagation of the specific morbid poison. —

Keeping in my mind's eye a pretty severe epidemic last Spring in the adjacent parish of King Edward, of which I am Medical Officer of Health, and also a comparatively mild one & a few sporadic cases in Maeduff this winter, I would notice

### I. Prevailing atmospheric Conditions.

Situated on the seaboard, the climate during winter & spring months is rigorous & severe N.E., E., & S.E. winds prevail, and the atmosphere is always more or less charged with moisture —

Snow seldom falls, in the town at least it never lies; in the Country the opposite state predominates.

The epidemic in King Edward broke out on the approach of Spring during a continued tract of wet, & after the melting of the Snow when the air was saturated with rain.

In Maeduff it began under  
similar

Similar circumstances this Winter.

We had a storm of snow early in Dec., followed by a good deal of sleet & showery weather. Similar results followed. —

One fact impressed itself upon me, as my body can testify, but which I am unable to explain. —

There was a peculiar depressing state of the atmosphere which acted strongly in reducing the normal standard of vital energy, in a marked degree. Old and infirm people — chiefly paupers — died after a few days illness, without suffering or complaining of any special ailment, beyond debility. Their life simply went away, as if it had been crushed out of them.

Succeeding this, Catarrhs of an asthenic type followed, then a few sore throats appeared, so trifling as to require no medical advice, but shortly afterwards a genuine case of

of diphtheria presented itself, and in ten days later it had become epidemic.

II Physical conformation of the district.

The rural district where like results obtained differs somewhat from that of Maeduff. - The former is chiefly hilly, bare & barren, but marshy & wet, with a cold, damp soil. It abounds in peat & heather, from which the fuel of the district is obtained. -

The latter is low lying, - at least where the disease is worst, - and built on sand or trap rock. -

III The Sanitary condition of the district - & houses are also not unlike.

In King Edward, as in all country districts, sanitation is at a low ebb: the abundant fresh air being considered a sufficient disinfectant for all such purposes.

The land is badly drained; a few open



See page 22.

(1) Watson's practice of physio vol I. 898.

open surface drains being the only means provided. The domestic water supply is usually taken from the nearest spring or, when this is not available, from a neighbouring brook. As a rule the quality is good, containing a small proportion of earthy salts, with too much vegetable organic matter in suspension.

Being mainly composed of small crofters, the dwellings are in some instances of the most primitive kind. Among the lowest orders they are built entirely of mud or of stone and turf. A hole in the roof serves for chimney & ventilator, equally ready to admit the snows of winter or the golden rays of the summer sun. Stone and lime are reserved for the select few. Each crofter cultivates land sufficient for one or two cows, sometimes a horse, besides pigs and poultry. These are all sheltered in erections adjacent to, often adjoining, that

that of the family, and as manure & filth of all description are collected around the very doors of the dwelling house itself, need we wonder that such places form the hot beds of disease! —

Macduff is a town, regularly and well-built, on the slope of a hill.

The drainage is fairly good, thanks to its natural situation. The drains are built of dry stones, admitting of percolation through the soil, and flushing of these is almost unknown.

The seatown portion is low-lying, and drainage imperfect from want of proper fall. In the absence of a proper gravitation water supply there are few W. C.'s in dwelling houses, & only very few sinks for waste water, all of which I understand are well trapped. Outdoor sinks communicating directly with the main sewer, without the intervention of a trap, are the rule. —

The <sup>Water</sup> Supply consists of a series of Springs and wells. The higher part of the town is well watered, and even public opinion claims for it a special exemption from disease. The lower part obtains its supply from 2 sources, the one a Spring of beautifully clear water, the other is a collection of surface water impregnated with chemical manures & other deleterious matter received from the fields which it drains.

These empty themselves into a common cistern, from whence it is sent on its message of death. I have frequently tried to impress on the Local Authority the absolute necessity and urgency of a new & comprehensive water scheme, and I am glad to say that common sense has at last prevailed over ignorance & prejudice, & only last Saturday (March 3<sup>rd</sup>) saw the ~~inauguration~~ inauguration of this much felt want, which must prove an inestimable blessing

\* The question of Milk & Food Supply  
is one of paramount importance.

I have investigated this subject closely  
in connection with these outbreaks, but  
am unable to obtain data sufficiently  
conclusive as to reasonably show these to be  
the source of infection -

See page 19.

(1) Brit. Med. Journal Vol I, 1882. p. 421.

Vol II 1882. page 19.

blessing to the whole Community.

The ash pits and fish offal are another fertile source of Contamination, and this also is restricted chiefly to the Seatown. The distance between these & the dwellings is usually the breadth of the street fronting the beach &, altho' they are supposed to be cleaned out regularly & inspected periodically by the local Authority, great laxity prevails. —

IV. The prevalent diseases preceding these two epidemics were, singularly enough, also the same, viz— Measles and Hooping-cough. In both Cases a considerable period had elapsed & the health of both districts had greatly improved, but I observed that the families which suffered most severely from Measles were most liable to be attacked by Diphtheria. —

The presence of sore throat co-existent with an epidemic of Diphtheria is a common occurrence. Whether these

See page 18

(1) Trousseau Clin. Med.  
Vol. II page 530.

See page 18.

(2) Lectures on Pathology. Sess 1874-75.

Cases of simple catarrh by means of transmission through a number of persons living, under circumstances favourable to the development of diphtheria, could be possibly cultivated, per se, into a well-marked case, is a question open for inquiry. —

My opinion inclines to the negative.

I find, during an epidemic, that the worst cases occur towards the beginning of the outbreak when it manifests a degree of severity which passes off as its prevalence declines. When the disease is thus on the wane, mild cases almost identical with pharyngeal catarrh in appearance, crop up. These I consider to be modified diphtheria, for although the pathognomonic sign of the membrane is wanting, yet they sometimes present a slight glassy, glistening appearance which has no tendency to ulceration or suppuration as the result of inflammatory action. —

The sore throats preceding the  
Epidemic



1. Holmes' System of Surgery  
Vol IV Page 500.  
West. Diseases of Children  
page 406.

2. Clinical Medicine Vol II. page 530

epidemic are essentially catarrhal, and although not specific, highly predispose and show a great tendency to receive the Contagion. —

The Exciting Cause of the disease is the entrance into the system of a specific morbid poison which reproduces and multiplies itself in the body, developing all the phenomena which characterize this affection. —

As to the precise nature of this specific poison we are in the midst of conflicting views. Some writers<sup>(1)</sup> consider it to be a form of septicæmia — the throat affection being only a local manifestation of the constitutional disease. —

Trousseau<sup>(2)</sup>, on the contrary, believes it to be a local affection in the first instance, subsequently becoming constitutional. This is a matter of great importance from the treatment point of view, for, adopting this latter opinion, by energetically treating the

(1) *Trousseau's Clin. Med. Vol II. 530.*

(2) *Lectures on Pathology. Western Infirmary, Glasgow.  
Session 1874-75.*

the local affection we hope to arrest its progress and prevent the occurrence of ulterior symptoms. This idea expresses the rationale of the modern treatment of the disease. —

The immediate effect of this poison is the local action on the Mucous Membrane of the throat which looks swollen and red, as if the seat of active inflammation; and perhaps it is, but if so, it is of a specific nature, and not an ordinary inflammation.

Bretouneau<sup>(1)</sup> states that "The specific character of the inflammation much more than its intensity or the nature of the tissues in which it is seated exerts an influence upon the functional disturbance produced by the inflammatory lesion: it is, he said, to the specific character of the inflammation that the duration, severity, & danger of most pyresiae are attributable." —

"Dr Coats<sup>(2)</sup> says it presents no indication of an inflammatory process altho' a  
pus

- (1) *Brit. Med. Journal* Vol I. 1862, page 421  
+ Vol. II page 19.

pus corpuscle may by accident be found perhaps from an adjacent mucous membrane in a state of Catarrh. A piece of the Membrane stripped off the Pharynx and placed under a lens shows that it consists of nothing else than the more or less altered pavement epithelium of the mucous Membrane passing on in the later stages to the condition of a slough.

It has been alleged that the discovery of a microscopic fungus had given an explanation of the whole pathology, but this idea was rejected as untenable.

In the face of the recent researches of Koch & Buchner in investigating the Etiology of Phthisis &c we could not be held as rash to infer that, as these diseases have been demonstrated to be caused by, or associated with the presence of minute organisms, we may be within measurable distance of an ascertained fact that a special form of Bacillus is the one essential and active agent

in the propagation of diphtheria.

Intimately connected with the Nature of the Poison is the Manner of its dissemination.

I That it is contagious or has a tendency to propagate itself by Contact from individual to individual is a truth which no one can dispute. It is exemplified in our daily practice and established beyond the shadow of a doubt. I will give one example of many. —

Case (a) E. G., aged 7 years, about six weeks ago visited the house of <sup>a</sup> neighbour whose child was suffering from diphtheria. A few days after she began to complain of general malaise accompanied with sore throat & slight fever. On examination her parents found the throat red & swollen, but apprehending nothing serious delayed calling medical assistance. Matters getting worse I was sent for & found the fauces covered with the characteristic membrane.

membrane, Swollen glands and the other usual symptoms. Under treatment she soon recovered. Two days after my first visit her sister, brother, and mother were attacked in succession, in all of whom the disease ran its course & all recovered. The father alone escaped its influence. There being only 2 rooms in the dwelling, constant intercourse among the members of the family took place, & here all were placed under the same conditions and exposed to the same influences. —

(13.) Another illustration. —

A boy aged 8 years was sent from Petalio where diphtheria was raging to Fishrie (Eastern half of King Edward) in order to escape the disease. He was sent to school along with the other boys of the family with whom he resided. A few days after his arrival he complained of sore throat but nothing was thought of it. Being in the vicinity I was asked to see him and found a genuine case of



(1) Watson's practice of physics.  
vol. I. page 898.

of diphtheria. I ordered the rest of the family, most of whom were afterwards affected, to be kept from school; but too late. The seed had been sown. Several other scholars similarly caught the infection & it soon became general. I caused the School to be closed for a month, cleaned & disinfected. By that time the Cases had become fewer, & on reopening suspicious ones were detained at home. The epidemic gradually disappeared with a low rate of mortality. —

(C.) A well-known instance is that of the late Princess Alice who, on kissing her dying infant, inhaled the germs of an early Grave. —

While diphtheria is universally admitted to be contagious, is it also Infectious?

Sir W<sup>m</sup> Jenner<sup>(1)</sup> says "There is not the shadow of ground for the belief that the disease can be carried by clothes &c from one house to another."

To this assertion I enter my most emphatic protest. If not so infectious as Scarlatina, it is quite as much so as some of the Exanthemata. Look at the progress of the disease! It comes to us under the form of an epidemic, it attacks individual after another or breaks out in any given locality, runs its course and disappears. In its invasion, progress and exit it thus resembles the above class. Whether the infection be carried as a miasm from the lungs & bodies of the sick, or in consequence of some atmospheric change, it matters little. When once the disease appears we find it spreading so rapidly over whole neighbourhoods & districts that it seems quite inconsistent with the notion of mere contagion. —

An illustration.

(1) M. K. aged 22 years met with an accident near Keith about the middle of January which necessitated amputation through

through the shoulder joint. She was sent to Banff Infirmary where the operation was performed. All went on well for 3 weeks, wound healing beautifully & otherwise improving.

One morning she complained of having had a rigor during the night; that her throat was sore & that she felt all out of sorts. On examining the throat, the tonsils were swollen and covered with the membranous exudation, a few patches also appearing on the wound. Next morning she was a corpse. Where did she contract the disease? Not at her home in the country, for no cases existed there. Not in the Hospital which is a modern building erected on the most approved sanitary principles & equally free of the disease. How then was it conveyed? It so happened at that time that diphtheria was very prevalent in Banff & neighbourhood, and I doubt think it far-fetched to conclude, in  
the

the absence of other proof, that the Surgeon himself was the infecting medium. Since then several others in the same ward have been attacked & it threatens to become epidemic.

II. A patient of mine aged 12 years convalescent from pneumonia complained to me of very sore throat with difficulty of swallowing. She had felt a little inconvenience for a day or two before in taking her meals, but considered it trifling. On examination the throat presented all the well marked features of the disease. Time did not admit of treatment; she rapidly grew worse and died next day from extension of the local mischief into the larynx. -

She was an only child, had been confined to the house for six weeks; the other inmates were healthy. None had sore throats & carefully avoided all risks of infection. From whence did it originate? A busy-body accustomed visiting her sick neighbours called I fear  
once

(1) Brit. Med. Journal Vol II 1882  
page 1003 -

(2) Brit. Med. Journal Vol II 1882  
page 377.

once too often on my patient; after having, as I afterwards learned, sat up all night with some diphtheritic cases. The inference is obvious. —

One of the highest-authorities, Prof. Lister<sup>(1)</sup>, states — "Diphtheria is of a decidedly infectious character, and infection must usually take place locally even if the disease ultimately becomes constitutional."

Mr. Rees<sup>(2)</sup>, Medical Officer of Health for Carnarvon, mentions what he considers a case of dissemination of these germs by the wind. His assumption is that after the contents of a chaff-bed of a diphtheritic patient had been exposed to the wind blowing in the direction of another village 7 miles distant the disease shortly afterwards appeared there, altho' it had previously been free. This theory, per se, establishes a *prima facie* case of infection. —

The points I wish to bring out are — that while diphtheria is contagious it is

(1) Clin. Med. Vol. II page 497.



is also Infectious; and essentially Epidemic rather than Sporadic. Not that I mean to assert that no isolated case can be diphtheritic, but that such must be viewed with suspicion, for if further traced out we may find it wanting in some characteristic feature of that disease and be referable to some other class of throat affections. —

Having seen that it is both Contagious & Infectious, is it Inoculable?

I can only refer to the writings of others for data under this head. —

"Rousseau" gives a case of M. Vallier who, when examining the throat of a child, received into his mouth a quantity of sputum ejected in the act of coughing. He contracted the disease and died within 48 hours. —

Another colleague of his during the operation of tracheotomy applied his mouth to the wound to suck out  
Some

some blood which was causing suffocation; he also inoculated himself & died within 48 hours.

On the other hand, Trousseau himself & Dr. Peters punctured their arms, palates & tonsils with a lancet moistened by contact with a piece of fresh membrane & no bad results followed.

This seems rather anomalous. — The only apparent deduction is — that in the first two cases they must either have contracted the disease through inspiring the infected atmosphere before the contact of sputum in the one case, or the lips & blood in the other: or else that, *ceteris paribus*, some people are more susceptible to the influence of the virus than others. —

Symptomatology & Morbid Anatomy are not included in the scope of this paper. —

Treatment. —

The old adage "Prevention is better than Cure" is an axiom which specially commends itself to the profession. —

Sanitary science is of late coming into more prominence, and asserting an ambitious place in practical medicine. —

It opens up a field of investigation for the sharpest minds or most brilliant intellects, and if its present inducements are not to be compared with those of the learned physician or the skilful Surgeon, it offers a far higher reward in the lasting benefits it confers upon a grateful people. —

Having obtained a general idea of the Etiology, the Prophylactic treatment will necessarily consist in the removal of all those causes already mentioned, predisposing and exciting, which develop and propagate

propagate the disease. -

I Isolation of the patient when possible, & a thorough application of disinfectants during the course of the illness and after its termination.

Where, from the number of cases and other causes, it is impossible to isolate all those affected, we ought to impress upon the Community the necessity of keeping aloof & holding no communication whatever with any known or suspected source of infection.

## II Attention to Sanitary details.

The dwelling house and bed rooms should be Commodious, with high ceilings, dry & well ventilated.

Drains well-trapped, ventilated and water tight.

Ashpits, piggeries & stables removed a considerable distance from the dwelling house, kept clean & drained.

Water Supply as pure as possible, and tested

Wiener Medical Zeitung No 35. 1879.

tested every now and again for sewage & other impurities. —

Supply to W. C. must be independent of drinking cisterns.

Milk & food of proper quality, taken only from cleanly, healthy people and districts.

Clothing sufficient for the requirements of the weather.

Healthful exercise, personal cleanliness & the numerous other details which Nature requires to satisfy her demands. —

III Drugs. Prof. Klebs believes the most potent agent in exerting a destructive influence on the diphtheritic process is Benzoate of Soda, and states that its administration strongly tends to prevent the establishment of the disease. He uses it when the attack begins 3 $\frac{1}{2}$  - ii to a child of 5 years. I have tried it in two cases & both were rendered abortive, but I suspect they would have been mild cases whatever.

(1) *Trousseau's Clin. Med. Vol II. page 583.*

I have heard medical men of high standing recommend the regular use of a decided stimulant e.g. brandy or whisky as a sure protection. A rigid adherence to this panacea for all ills would, I fear, ere long produce consequences worse than the disease.

The method I usually adopt is that pursued by most practitioners viz: to brush the throat with a strong solution of nitrate of silver 10 grs to ʒj of water when the characteristic spot or patch of membrane like white kid, appears. This is the time when a single application may effectually destroy the poison and rescue our patient.

As it is of the utmost importance that a proper inspection of the throat should be made, I will give Trousseau's method of procedure in Children!

"First of all, you must let the child see that you are his master; and  
when



when he has seen that resistance is useless, he will cease to offer any. - To accomplish this object, place him on the knees of an assistant by whom he is to be firmly held; another person is directed to keep the head fixed in position. When the child struggles and cries, seize the opportunity of his opening his mouth to introduce the handle of a spoon pushing it back to the base of the tongue. As a consequence of this proceeding, the child, being seized with a desire to vomit, opens the mouth still more widely and you are thus enabled to see to the very bottom of the throat."

### Acute Stage.

It is rarely we see our patients at the very outset, or early enough to put the prophylactic measures in force. In the majority of cases the disease has established itself & presents all or most of its

Characteristics

*Hospital Gazette 1879.*

characteristic features. The measures employed vary considerably according to the individual views of the practitioners. Prof. J. Lewis Smith, New York gives for a child of 5 years, internally.

R<sub>1</sub> Quin. Sulph. ʒʒ  
Elixir Tarax Co ʒi ~~ʒss~~  
Sig. ʒj every 3 hours.

R<sub>2</sub> Tinct. Ferri Mur ʒii  
Pot. Chlorati ʒii  
Lyr. Simplicis ʒiv ~~ʒss~~  
Sig. ʒj every hour between the previous mixture.

Locally. He sprays the throat 5 or 6 times a day with a steam atomizer medicated with the following

R<sub>3</sub> Acid Salicylici ʒʒ  
Glycerini ʒii  
Aq. Calcis ʒviii ~~ʒss~~

Between the spraying he brushes the throat with this mixture - viz.

R<sub>4</sub> Acid. Carbolic ʒviii ~~ʒss~~  
Liq. Ferri Sulph. ʒii  
Glycerini ʒi ~~ʒss~~

The

*Med. & Surg. Reporter March 1877.*

The effect of this he says converts the pseudo-membrane into an inert mass, and destroys the movements of the bacteria which he has observed swarming on it. I can testify to the efficacy of this treatment which is somewhat like my own. —

D<sup>r</sup>. Drysdale, Philadelphia, is persuaded the most valuable of all remedies is Chlorate of Potash properly & efficiently administered. —

R $\bar{y}$  Pulv. Pot. Chlor. gr. 120

Syr. Limonis ℥j

Aquae ℥ $\frac{iii}{4}$  ~~℥~~

℥j every three hours to a child of 2 years. — He considers all local treatment unnecessary, except by the solution, itself, which exerts a solvent action on the membrane upon which it acts every time it is administered. This is the experience of most practitioners who, however, combine it with iron or other tonics. —

<sup>(1)</sup> South. Med. Record, May 1879.

<sup>(2)</sup> Wiener Medical Zeitung  
No 35. 1879

<sup>(3)</sup> Science & Practice of Med. Vol II.

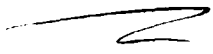
Dr. H. W. Carpenter<sup>(1)</sup> states the Chlorate of Potash cannot be borne in sufficient quantity to cure an asthenic case without causing a dangerous depression of the heart; consequently he combines it with Quinine to steady heart's action. Along with iron and quinine it is more efficacious and safer.

Dr. Wiss<sup>(2)</sup> Prussia, holds that Quinine is the most-potent drug to prevent the infection and destroy its activity. - He employs it combined with Chloride of Ammonium until the fever subsides, then gives tincture of iron in large doses 3 or 4 times a day.

Dr. Aitken<sup>(3)</sup> follows the same line, but mixes them all together

R. Quin. Sulph. ℥ss 24  
 Acid. Mur. dil. ʒii  
 Tinct. Ferri Præpar. ʒii  
 Infus. Calumbæ a℥ ʒvi

℥ʒ in water 3 times a day.



<sup>11)</sup> Clin. Med. Vol II 569-593

" page 572.



Trousseau describes the action of different drugs so fully & well that it is unnecessary for me to say more regarding these. He sums up thus—

"I have insisted upon the uselessness, the danger of antiphlogistics, which I absolutely interdict in the treatment of diphtheria. I have endeavoured to show that Mercurials & alkalies in so far as they are alterative Remedies present more disadvantages than advantages. I also told you that certain medicines such as Sulphate of Potash & polysala Smege have justly fallen into oblivion. I have laid great stress upon the Question of Blisters, & have implored you never to employ them, their action in diphtheria being deplorable & perilous in the highest degree. Finally, I stated that I had come to the Conclusion, after the teaching of a long experience that topical treatment by astringents, cathartics, & Caustics is pre-eminently the best treatment

(1) Brit. Med. Journal 1882. Vol II page 1003.

treatment of diphtheritic affections; but I did not say that it could by itself cure the disease" He then gives the general treatment recommending the Citrate & tartrate of iron.

His local measures consist of the insufflation of powdered alum through a quill, alternating it with insufflation of tannin, in mild cases. In severe cases he employs fuming hydrochloric acid, repeating it 3 or 4 times in twenty four hours, if required.

I have tried this myself, but always diluted with an equal quantity of honey. My objection to it, is that it produces a white spot, exactly similar to the diphtheritic patch, on those parts of the healthy mucous membrane which it touches which is apt to be very misleading, while its benefits are not superior, if equal, to those of Nitrate of Silver.

D<sup>r</sup>. Goodhart" narrates 6 cases treated by the local application of boracic acid dissolved in glycerine, used

used in part by a hand spray, in part by a laryngeal brush, every 2 or 3 hours. He claims that it is very beneficial in loosening, dissolving and preventing the re-formation of membranes.

I have used this preparation very extensively myself in mild diphtheria & simple pharyngeal catarrh of children with the best results.

The advantages it presents are that it is antiseptic, the glycerine keeps the acid longer in contact with the part to which it is applied, and that its action is harmless if not beneficial.

Personally. The plan I have been in the habit of pursuing is to some extent a combination of the foregoing, more or less. Not that I always adopt the same means, but vary them according to any peculiarity or special feature of the case on hand.

Topically, I usually begin with the application of nitrate of Silver grs 60 to ʒi

of water by means of a camel-hair brush and repeated every 2 or 3 hours for a few times until all the membrane has disappeared. The advantage of the Solution over the solid caustic is obvious. The brush can be carried down over the larynx, sweeping all the back of pharynx, and upwards toward Eustachian tube & Posterior Nares. — Then I substitute for it Glycerine of ~~the~~ Carbolic Acid (B.P.) with which the throat is painted every 4 hours, using the Nitrate of Silver once a day, generally at night. —

A most valuable adjunct is the use of Seisle's spray 5 or 6 times a day with a medicated solution, as.

- R<sub>1</sub>. Potass. Chlorat. ℥ss 40
- Glycerinae ʒj
- Liq. Calcis ʒiij ~~℥ss~~
- or. R<sub>2</sub>. Acid. Sulphurosum
- Aquaes — aa ʒij ~~℥ss~~
- or. R<sub>3</sub>. Acid. Carbolicum ℥v xv
- Liq. Calcis ʒvi ~~℥ss~~
- For spray

When sloughing begins to occur, and the breath becomes foetid a weak solution of Condy's fluid - Pot. Permang.  $\text{gr } \frac{1}{2}$  to  $\text{ʒj}$  of water - is very serviceable for gargle or inhalation. When there is extension of the disease into the nares and a discharge from the nose I inject the above solution, or a weak solution of Nitrate of silver  $2\text{ grs}$  to  $\text{ʒj}$  twice a day. —

I generally recommend the swollen glands at the angle of the jaw to be rubbed gently with warm Camphorated oil, & a linseed-meal poultice or Spongopiline to be placed round the throat. —

Inhalation of the steam of warm water or water & vinegar, and the constant use of a "Bronchitis" Kettle to render the atmosphere warm & moist - conduces considerably to the Comfort of the patient.

The internal remedies may be summed up in tincture of iron & chlorate of Potash. —

R. Potassi Chloratis grs 60  
 Tinct. Ferri perchlor.  $3\frac{1}{4}$   
 Syr. Limonis  $3\frac{1}{2}$   
 Aq. ad  $3\frac{1}{4}$  ℥

Sig. A teaspoonful in water every three hours. To a child of 4 years.

Adults in proportionate doses, who are ordered to gargle first & then swallow.

When there is much difficulty in deglutition, gargling with iced water, or sucking small pieces of ice is very soothing. —

When the exudation shows a tendency to spread to the larynx with difficulty of breathing, from tumefaction of the fauces or accumulation of membranous deposit, I give an emetic of ipecacuanha or Sulphate of Copper. —

To combat the general debility and prostration which attends in such a marked degree, concentrated food, bread steeped in beef tea, soft-boiled eggs, and abundant fluid nourishment in the shape of soups, jellies & milk are

are given from the outset. —

Stimulants are usually required: Sherry for Children, Brandy or port-wine for adults; the Quantity given being regulated by the requirements of each individual case. —

When depletion has been very difficult or impossible, and patient refuses nourishment — or stomach rejects it, we must resort to beef tea & brandy emmetata. These are desperate cases & seldom recover. —

### Tracheotomy.

This operation which is becoming more common with the advances of surgery is one which, for various reasons, few general practitioners are called upon to undertake. There is a popular prejudice against it, arising not merely from the high rate of mortality and the pain which it is believed to inflict on the little sufferer, but due in some instances to a local superstitious dread of



1) Clin. Med. Vol II 597.

of fatal injuries occurring in that region. This I know, the bare idea of such an operation, which I have often recommended & sometimes insisted upon, can scarcely be entertained.

Trousseau" says, in language so strong as almost to imply criminal culpability, that it is the imperative duty of every medical man to operate when circumstances are favourable. Be that as it may, however anxious we are to do our duty, it is one which in practice is extremely difficult to carry out.

Of late, I am glad to say the success of my general treatment has been such that I have seldom seen the necessity for surgical interference when I have been in attendance sufficiently early to employ the measures already described.

Of my fatal cases, some were dying when I first saw them, & in others the trachea became so suddenly & extensively implicated that it would have been folly to have attempted it. I have, now & again  
however,

(1) Clin. Med. Vol II. 595.

However, I see cases which presented a reasonable chance of success, but from some cause or other, objection on the part of the parents, or want of intelligent assistance, the operation was delayed. —

I confess I have never performed this operation for diphtheria, altho' I have done so once for Croup - unsuccessfully, and assisted at 3 others.

My experience, therefore is so limited that I can offer nothing new on the subject. —

Trousseau<sup>(1)</sup> has operated 200 times with  $\frac{1}{4}$  successful, and adds that  $\frac{1}{2}$  of the Cases operated on in private practice ought to prove successful, provided the operation is performed under conditions in which recovery is possible. A full account of the Operation, with the indications for & against it is given in his Clinical Medicine

Vol II. pages 594 - 618. Also in Holmes' System of Surgery Vol II. page 494 - 514.

Convalescence.

The treatment during this stage is somewhat similar to that followed after any exhausting illness. The recuperative powers of Nature must be assisted as much as possible. —

Change of residence to a dry bracing atmosphere, combined with tonics & nourishing diet complete the cure. —

From the amount of Anaemia present, iron is particularly indicated, either alone or combined with Quinine.

R. Ferri et Quiniae Cit. grs 60  
Syr. Limonis  $\frac{3ij}$

Aq - ad  $3vi$   
Sig. 3p in water, 3 times a day.

The Albuminuria usually passes off without treatment. Should it remain longer than might be expected I order

R. Pot. Acetatis grs 150  
Pot. Iodidi — 60

Mist. fruct. Co. (ab. Ph.)  $3vi$  Soln.  
Sig. 3p in water 3 times a day.

(1) *Edin. Med. Journal. Aug. 1876.*

The Paralysis which frequently follows is best met with *Liq. Strychniae* or some preparation of *Nux Vomica*;  $\frac{1}{4}$  gr of the extract of *Nux Vomica* in *Pil. Thei Co* is found to be highly suitable. —

When the Paralysis is very decided, *Lic. John Rose Cornac* recommends the use of a paste composed of ginger and mustard, with gentle kneading of the paralysed muscles three or four times a day.

Galvanism is injurious if resorted to, too early, as it exhausts the nervous power of the affected muscles. As the patient gets stronger it, along with sea-water baths, generally suffice to perfect the Convalescence.

Other Symptoms must be treated on general principles. —

If, in these imperfect Remarks, I have been the means of stating anything

anything which might tend to the further elucidation of this subject in the interest of Humanity or Science, I feel my labour has not been in vain. ———

Thomas B. Horrie, M.B., F.R.S.  
Paroch. Med. Officer, & Med. Officer of  
Health for the Parishes of King Edward  
& Maeduff.

### Declaration.

I hereby certify that the foregoing  
"Remarks on the Etiology & Treatment  
of Diphtheria" has been solely composed  
& written by me.

Thomas B. Horrie.