

Antiseptic Treatment  
of Typhoid Fever (by Salol)  
with notes of Cases

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September 1896



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# Introduction

Gentlemen.

The difficulty I have felt in writing this thesis is outbalanced by the difficulty in finding a suitable name to call it. However the method I have adopted is as following; after taking notes on cases, <sup>extending</sup> over three years and watching them from a clinical standpoint, and after a careful perusal of the literature on the subject. I think the best way I could do is to review certain of them which comes within the scope of my paper & give my criticism

of the different theories & methods employed as well as to show just ~~methods~~ reasons for the methods I claim. Possibly many of the latter may seem at variance with many of the authorities but I feel that the conclusions which I have arrived at are the result of an honest study from a practitioner's standpoint. As regards the last chapter on "Aetiology" for some time my mind has been made up although I endeavour to keep my mind open on the subject and my reason as much as anything is to place

The matter as it stands  
before You, and I shall  
only be too pleased to  
have Your opinion on it  
no matter whether favourable  
to me or not. Apologizing  
for what may seem a  
superfluous introduction.

Part I

## Treatment of Typhoid Fever -

In looking over the literature on this subject one is impressed with the fact that probably in no other disease do we find such a variation of opinion as we find in causation and treatment of Typhoid Fever.

— As regards treatment -

We are always confronted by the theory advanced by some of a "change of type" in the "constitution of mankind" and a belief in the type of the disease itself; which is held & perhaps justly so by many instances - Numerous statistics on mortality of disease from 1848 to 1840 of 5,988 cases & that in the principal hospitals of Europe & found

mortality averaged 14.45%  
 But since that time, & putting  
 out of consideration the brilliant  
 results achieved by medical  
 men here & there, and the  
 results following special  
 modes of treatment, we find  
 without doubt a reduction  
 in mortality all along the  
 line & this I think may  
 be due (1) diminished gravity  
of disease (2) diagnosis is made  
much earlier now than of old &  
so we are able to get the  
cases well under hand from  
the commencement & so patient  
 has better chance.

- (3) Some improvements in our  
methods of treatment  
 4 our efficient staff of nurses

in hospitals in cities & towns  
but which the country  
practitioner cannot always  
get.

- Unlike chronic maladies when  
often our knowledge of origin,  
& causation remains obscure.

The phenomena variable & diagnosis  
proportionately difficult but  
in infective fevers like typhoid  
there is considerable uniformity  
in their phenomena; we know  
they run a tolerably defined  
course & we find physical  
characters nearly always  
constant, so we would  
think that treatment of typhoid  
& other infective fevers would  
be plain sailing but it is not  
so. - - - our knowledge



of Bacteriology helps us greatly; we know causative agent is infective origin a microbe introduced into body from without, this having characters of living propagating poison & able to multiply in tissues of body & setting up functional disturbances in some cases this becomes so great as to destroy life of individual attacked. — Knowing such our aim must be not to treat symptoms alone but to try & aim at cause & destroy it if possible. if we fail in this we must try & modify influence of their activity life by

exposing them to influences & agencies which have control over them

Different Modes of Treatment

- (1) Antipyretic
- (2) Antiseptic
- (3) Local Treatment
- (4) Both Antiseptic + Antipyretic

Antipyretic - aims at improving chances of patient & the means it takes of avoiding complications is by lessening average temperature throughout illness.

Of this method we know that it comes into touch with all other methods. Yet the Cold Bath method is adopted by the antipyretic school. For it will give a survey

as its advocates are able to  
produce good results,

### Gold Bath Method -

Invented by Brand  
bath has become much modified  
at present day, amongst results  
we find

Jürgenson was able to reduce mortality to 3.1

Liebermeister . . . . . from 24.3 to 8.1

Estler . . . . . to 7.1

Hare & Barr are chief advocates  
of to-day & let us examine  
their claims & statistics

are in report of Brisbane Hospital (Lancet 1912)

Says mortality from haemorrhage  
& perforation was unaffected & that  
no mortality below 5% can be  
expected he claims for this method

- ① Reduction in number of fatal pneum<sup>onia</sup>
- 2 Brain complications & delirium less frequent

3) Cardiac failure would cease  
if got patients in first week

criticism

I am sorry that I have  
never been able to try this  
method but my objections to it  
are thus

- (1) Very cumbersome & unsuited  
for private practice or in  
my case in the country where  
cases occur at long distances  
& where no proper hospital  
accommodation exists
- (2) Course of disease is not  
checked
- (3) It is not claimed that all  
cases treated by this method are  
saved from death due to  
toxaemia so I think I am justified  
in waiting for better evidence

of benefits derived by this tolemaic treatment

(4) According to writers amongst whom are Cayley it is claimed that relapses are more frequent by cold bath method

(5) Are we treating cause + is not increased temp nature's effort to throw off poison?

(6) Though it may seem risky to minimize high temp yet I maintain that by other method less cumbersome + more comfortable to patient we get equal advantages as a cold sponging.

B Sponging with vinegar + water if temp above 103

C Ice bag in room

D Ice

Another modification of the  
Antipyretic treatment is that  
of Valentine

Valentine's Method consists of ingesting  
large amts of fluid & as much  
water as can be given without  
disgust, - he also uses cold  
baths, - He maintains that  
free diuresis is marked &  
patient passes about 2 litres  
in 24 hours that thinks Good done  
by probable influence on elimination  
but he also adds that  
it (fluid) acts by restoring  
to tissues the fluid which  
febrile condition takes from  
them & he regards this as nature's  
cry

criticism

Granted You allay thirst

but withdrawal of fluid from  
 organism is not cardinal feature  
 in febrile condition & there is  
no justification for this idea

- In fever we have increased ~~fever~~  
 temperature, accelerated pulse &  
 respiration & diminished capacity  
 for assimilation why then treat  
thirst & pyrexia only? We  
 can easily allay thirst, but  
 in typhoid we have specific poison  
 running fixed course & I think  
 we ought to aim at reducing  
 baneful influence as far as  
 as possible while at same  
 time sustain strength of organism  
 & try to prevent complications.

rem Treatment.

This method is still in  
 its infancy & I think has a

a great future before it.

- I think it is now an established fact that when an animal serves as soil for growth of a given pathogenic microbe there are generated within it by the metabolic process of the microbes definite chemical products which are that microbes toxins, this first pointed out by Beazew. - so that if we obtain serum which can contain within it chemical substances capable of neutralising poison but at same time these bodies (some of them at least) are inimical also to growth & multiplication of particular microbe & so I think immunity may be conferred. - Still we



must wait till specialists like Klein & others place the matter on a safe basis

3 Antiseptic Method

This to my mind is a great advance. In typhoid we have intestine the seat of disease, ptomaines developing here, now, if we can render the intestinal tract antiseptic then I think we have made an advance. This method has found many advocates & tho' they may severally differ in agents employed still the end to be attained is the same.

- We have two plain oblectory indications by this method one General, the other Special

General Indication being to support & strengthen resisting powers of organism which is being attacked & is passing this grave crisis

Special Indication being to attempt to diminish gravity of crisis by opposing or counteracting activity of specific morbidic microbe which is infecting system & if we attain the latter we make an advance

I think much harm has been done to antiseptic method by its advocates claiming that it is germicidal, but in the meantime I think if we take the more rational method of thinking ie that the object of their administration is not so much germicidal

But in our ignorance of such we render the influence of typhoid bacillus less harmful by improving condition of bowel and by diminishing risk of secondary fever from putrefaction + the development of ptomaines or by attacking these when formed or even still by hastening their expulsion from body. -

Another advantage from this method is that we relieve distension of bowel by mechanical effect + so lessen risk of perforation

- Many medical men do not like the idea of intestinal Antiseptics + it has even been said that it was so murderous that the patient succumbed

rather than Bacillus (Latham in  
 "Harveian Oration 1886), but I think  
 this statement is not justifiable  
 - Just as we see in nature  
 that there are differences in  
 soil, climate & atmosphere  
 exerting greatest influence  
 over growth & development  
 of many forms of vegetable  
 life why then should the  
 same not take place within  
 organisms - If so then we  
 must try to find these out &  
 fight against them.

Literature on Antisepsis -

The history of intestinal antisepsis  
 is not a recent one, we  
 find Sir W Jenner (Lancet 1849) &  
 advocating correctors of fetor offensivus  
 He gave Charcoal

Murchison said first indication  
 was to neutralise poison then  
 improve blood the same Chlorine water  
Lie Tho Watson 16 years ago gave  
 mercury with this view got good results  
Dr Wick (British Medical Journal 1870)  
 gave creosote but it caused  
 nausea so he determined to use  
 some less offensive drug & more  
 powerful antiseptic & gave  
 Sulphurous Acid in 140 cases had  
 only 1 death he regarded it as specific  
Kesteven (Practitioner 1885) advocates Creosote  
Prof H Wood advocated Subpentine  
Prof Bouehard of Paris tried to obtain  
 suitable non-irritating antiseptic  
 tried Charcoal but now uses  
 B-naphthol mixed with Salicylate of  
 Bismuth. - He also insists on  
 Administration of Quinine which

he regards as general antiseptic  
 & this is supported by Oberth who  
 found it checks culture of  
 typhoid bacillus. — Jamin  
 Slenis favourite & finds strong  
 advocates in Dr. Cleveland in  
 (New York Review 1886). — Professors  
Grancher & Becholier of Montpellier

Prof Muchison advocate Chloramine  
 water mixture

Liebermeister (Von Ziemessens Encyclopaedia  
 of Practical Medicine) says that mercury  
 as Calomel acts as antiseptic  
 as well as purgative  
 He thinks Calomel & Iodine is Antidote

Prof Chaeris advocates Carbolic  
 Acid in Keratin coated pills  
 — I have tried Jamin, — Chloramine  
 mixture, Carbolic Pills & Salol in the

18  
in the treatment of typhoid fever  
under my care & I have obtained  
the best results from "salol," -

- Having treated over one  
hundred cases of typhoid  
with salol with nine deaths  
and when this is considered  
how many of them were  
nursed in small apartments  
& without the aid of trained  
nurses which perhaps is of  
more importance than any  
other I feel satisfied until  
a better drug turns up or  
even an antidote is known  
and why should we not  
look forward to that day?  
when we consider the recent  
advances made in Bacteriology  
& Chemistry. At any rate

I have <sup>seen</sup> Salol stand a fair  
 test & that with success.  
 - I should like to lay  
 before you some of the facts  
 of the drug & its uses, but  
 bear in mind I do not  
 claim like Dr Anderson of  
 Dundee that it is the Specific  
 & that it cuts short fever by  
 the third or fifth day. What  
 I should try to show is; that  
Salol is a safe drug, that  
it is an antiseptic (intestinal)  
 tone whose good effects are  
 borne out by experience

Epitome of Salol

Salol or Salicylate of phenol  
 is white powder. aromatic  
 taste, - insoluble in stomach  
 unaltered by gastric juice



but on reaching duodenum it meets the pancreatic ferment there at the commencement of small intestine it splits into its two elements phenol & salicylic acid - This the phenol element chiefly that I regard as beneficial - part in typhoid, - here the phenol disinfects the intestine, - and renders the condition of the bowel better able to resist the poison which is infecting it, while its action on the bacteria hinders their growth & prevents fermentative & putrefactive changes, - according to Siefert who shows that during absorption of phenols which are not found in free

state in the blood, - they combine with the albuminous substances and especially with the most readily reactive of them (the toxic-albumens); the products of microbial life. — These compounds of toxic albumens with phenols are probably non-toxic, - they rapidly undergo oxidation in the system and the phenols appear in urine as ethereal sulphates.

Hence we see that phenols not only directly destroy disease germs in intestinal tract and neutralise poisons formed there but after absorption they help or effect elimination of toxic albumens from system. — Again

Salol unlike most of the phenol group (Naphthol-Thymol Creosote Pyrogallol etc) has no burning taste but is rather aromatic, and is not caustic when concentrated.

- It does not create nausea or digestive derangements in fact my experience proves quite the opposite and even in the largest doses I have never had any toxic effects beyond darkening of urine due to presence of Hydroschinon. I have also found the greatest benefit derived from salol in summer diarrhoeas in children and adults - Being resident in one of the largest

colliery districts in Yorkshire where hygienic surroundings are bad while feeding is worse, in fact children being fed - perhaps in ignorance or carelessness on all kind of messes including tinned meat. bad fruit. bad fish Bacon ends etc while later on in the season the clothing remains unaltered in the cooler evenings after hot days so that every year I have hundreds of cases of Gastro-Enteritis and I have hardly ever known Salol to fail

As regards the other element Salicylic Acid it is useful being a powerful antiseptic and

antiseptic while its  
 antipyretic properties play  
 an important part & I have  
 invariably noticed a fall  
 of a degree or even two after  
 taking salol - Here then  
 we have a drug consisting  
 of two elements both  
 being antiseptic in their  
 action while one of them  
 possesses antipyretic properties  
 - I should be very sorry  
 to bind myself to these  
 always as a general  
 practitioner cannot afford  
 to bind himself in his patients  
 interests to one set or school  
 but while I try and  
 keep my mind open for  
 a better drug still I feel

that Salol has been a  
good friend - Briefly I  
append what I claim advantage  
of Salol

I. Unaffected in stomach - splits  
into elements in intestine which  
is seat of disease. These elements  
being powerful antiseptics  
attract the pathogenic ~~micro-~~  
-organisms or their products  
in intestine itself & are  
able to arrest fermentation.

II. Marked influence on stools  
the repulsive odour disappearing  
almost at once and is invariably  
noticed by patient & attendant  
while it is a good chalogogue

III. Good effect on diarrhoea &  
in typhoid cases amongst  
old people where Brouchet's is

useful in stopping diarrhoea when opium could not be used

IV Improves condition of bowel lessens formation of ptomaines keeps thus elimination

V If relapses according to Sir Chas. Cameron and others (see) are due to faecal fever from absorption of ordinary faecal matter (toxins) by wounded bowel then Salol as we know prevents this so must be useful

Advantages of Salol

A In excessive diarrhoea may require help of astringents but this is very exceptional

B Darkening of urine

C Don't get cleaning of tongue so quickly as obtained by some

other methods as by Iunium or Chloramine water -

In some cases I have had recourse as in low asthenic conditions with lung troubles to add other drugs & I have had good effects from <sup>Liebermeister's</sup> mixture of Iunium & Digitalis  
As regards Mercury

I must confess at the onset of illness I have tried Calomel and found good effects tho many physicians do not believe in this mode of treatment but when such authorities as Geo. Murchison & Liebermeister advocate its use then I feel justified. - One case I feel inclined to comment on in passing - a child



Laycock (child) fell sick  
 as there were two of the  
 other members of the family  
 were down with typhoid & father  
 was nursing the invalids and  
 at same time cooking meals  
 for others I feel convinced  
 that this child was in for  
 an attack of typhoid. - The  
 bowels were constipated - headache  
 anorexia present - temp  $100^{\circ}$

I gave gr III Calomel & 4 grains  
 salol every 3 hours & at end  
 of first week fever abated

So I feel convinced that  
 if we could get cases  
 early enough much could  
 be done to modify disease  
the modes of treatment

They are perhaps in their infancy

but the Chloroform to water  
Treatment by Stepp of Nuenburg  
 is worth mentioning - by it  
 he claims a shortening of  
 fever. and he thinks  $\text{C}_2\text{H}_2\text{Cl}_3$   
 passes thro system unchanged  
 without decomposition and  
 so has anti-bacteriological effect  
chiasm

I have not tried this  
 method but would the  
 Chloroform not degenerate blood  
 as we know from therapeutic  
 knowledge that it dissolves  
 blood corpuscles - so that I  
 think it has serious drawback  
yeast Treatment

By this method get  
 no relapses - as yeast prevents  
 re-infection from intestine and

It is claimed that yeast destroys bacillus, but I know nothing of this method + I think we must wait till we see good results.

Finally as regards treatment

If we who advocate the antiseptic method preach it then I think let us be consistent and when we diet our patients let us still carry out the principal as I think great harm is done by improper feeding - If we neglect this then we are undoing what our treatment aims at namely rendering the alimentary tract in as free a manner from fermentation + decomposition as possible, - I think there

is a tendency to overfeed  
 our patients with the idea  
 of nourishing them but when  
 we consider that if such  
 quantities are given that the  
 stomach is unable to assimilate  
 it then it must pass on to  
 the intestine whose mucous  
 membrane is in wounded  
 condition & fermentation  
 is likely to take place - again  
 let us try & render food  
 whether milk or not in such  
 a state that it will not  
 form an irritative coagulum  
 in stomach - milk ought to  
 be dilute & should be rendered  
 alkaline with this purpose.  
 Clear soups & plenty of fluid  
 are beneficial - This may be

allayed by toastwater, barley water or even coldwater.

During convalescence I have found malt extract do much good in those cases where there was tendency to constipation.

Alcohol -

In my early days I used Brandy frequently but latterly unless there are special symptoms indicating its use as muffled leech.

- Quick & almost imperceptible pulse - etc I withhold it having found out that in many cases its use was rather a drawback than otherwise

## Remarks on Clinical Features of Typhoid

We should imagine that in diseases due to specific bacillary infection that there always would be a tendency towards recovery when the influence of this infection ceased to exist, yet I think this leads to many fallacies in estimating results, for instance just as in "Scarlet Fever" we have many varieties (as "Simplex - Anguosa + Malignant") in the latter without specific remedies, as Antidotes, or Seminals, we should be helpless & this I think is common in all infectious diseases where death

is probably due to poison acting on nervous system & heart; and depression usually is extreme high temperatures common & pulmonary troubles as a rule supervene still I think these cases are rare - more often however we see cases where the fever runs a long course, relapses common (in typhoid) but still often we have to fight against the effects of long continued fever, which probably is dangerous from its effects on organic structures both voluntary & involuntary organs being affected; - again in typhoid we see cases in which the tissues under the effects of long continued high

temperature where wasting of body becomes very marked in fact many of my most troublesome cases were of this kind so that surely goes to prove necessity of keeping temperature within reasonable limits

Diagnoses

As regards diagnoses of typhoid fever in the early stages I must say like many others that it was often only by a process of exclusion (except when typhoid was endemic) that I was able to make a diagnosis; - indefinite history of cases & unsanitary conditions rendering it more difficult. - In looking over



a series of over a hundred cases I am surprised how often I have been baffled until some time elapsed, and probably the only excuse I can make is that the district in which I practice is a new colliery village and is in a transition state - Families are continually coming and going without giving any clue, while the conditions of work are hard and the men while at work are in a very warm atmosphere one hour then next hour they may be working in quite a cold one - the influence of this being to cause ailments very varied

- Contrary to general rule, in many cases I have found the onset to be sudden (whether this due to the patient's feeling becoming overcome as these colliers work whether feeling fit or not). - in others I have noticed the onset preceded by what seemed Influenza then passing into uneventful typhoid course. but what impressed me most was the great resemblances between Typhoid Fever & Pneumonia & in many cases especially in children the difficulty of differentiation.

or example

While typhoid fever was in our midst one case in

particular impressed itself on my mind. A married woman Mrs Phillips aet 39 had a sister down with typhoid and she used to visit her sister's house and do cooking occasionally she took ill - pulse little accelerated - dazed expression no pain thro chronic cough temp 100.8 - anorexia on examining chest I could not detect any physical signs of pneumonia for the next three days so under the circumstances I feel justified in reporting it as typhoid fever. - However on 4<sup>th</sup> day there was alteration in percussion note + râles present at right base +

in the evening a crisis set  
 in & the disease run a  
 typical course of Pneumonia  
 - no doubt the sudden onset  
 ought to have made me  
 regard it differently and tho'  
 during the first week I did  
 not feel comfortable still  
 I was quite unable to diagnose  
 pneumonia - Again in  
 children I have also had the  
 same fact exhibited, unfortunately  
 the doctor is regarded by  
 children (owing to mothers threats)  
 as a "bogey man" & often  
 great difficulty was experienced  
 in making an examination  
 of chest due to children  
 yelling & in many cases my  
 diagnosis was often not made

till after the end of first week. - What I do maintain  
is - that in pneumonia where physical symptoms are long delayed; with little or no alteration in pulse rate it presents great resemblances to typhoid and it is extremely difficult for the General Practitioner, who can only see his patient twice daily at the most & who has no reliable nurse to differentiate between them, in fact in some cases of pneumonia (three in number) I failed to discover any local signs till after crisis. - I find this is supported by Gustave Smith in his work

- Again although the rule regarding temperature in first week of typhoid is a good one yet I had one case where the temperature approached normal in 1<sup>st</sup> week (Chart 38) In this case there was little doubt left as three of the family were down with typhoid at same time at home while father cooked for invalids (which included mother) but same time cooked for other children

The notes on this case are (Chart 38)  
 Charles Laycock aet 14 complaining of Anorexia - feeling tired + headache - all 2 days the blamed it on cold caught at football match - Tongue

was coated - pulse quick  
 120 often - Spleen tender,  
 rash copious. diarrhoea  
 & typanites prominent. Yet  
 temperature on day I saw  
 him was 100.4 but after that  
 during three weeks it never  
 rose above 99.8 tho I tried  
 three different thermometers  
 so here I think shows that  
 we may have cases exceptional  
 to rule.

The Influence of Coal Strike in Colliery  
 Villages on Typhoid Fever

but of the 100 cases I am  
 reviewing I find that about  
 45 of them occurred in two  
 distinct outbreaks and were  
 confined to small colliery

village, twelve months elapsing between the outbreaks.

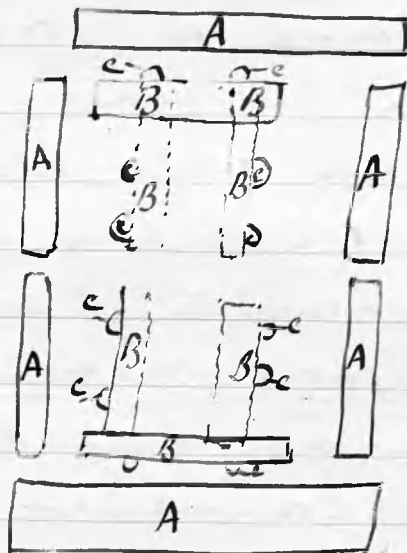
The first outbreak took place during the Coal strike of 1893 which lasted seventeen weeks so I wondered how far the influence of a strike would go. but I find that of forty three cases which occurred at that time only nine occurred amongst colliers or men out on strike the others consisted chiefly of railway labourers and children - This seems contrary to experience as naturally privations must necessarily lower the organism render it more liable to onslaughts of disease but since then



my experience shows me that a collier during a strike does not starve in fact many of them thrive between begging, poaching, and intimidating merchants with whom they are accustomed to deal

Causation of Typhoid in this district

I think we are helped in finding the causation when we consider the circumstances of the cases, - Seventy out of the hundred cases lived in small over crowded tenements, the houses were fairly ventilated by having fireplaces in each room but it is almost impossible to get these people to open their windows, - These houses however



A = blocks of houses  
 B = Closets + middle  
 C = water taps

are built round about  
 being of shell patron with  
 closets and middens between  
 In some cases these middens  
 are only <sup>about</sup> 18 feet from the  
 people's doors. - The ashpits  
 are partly open & communicate  
 at the top - Again the  
 sanitary arrangements are  
 defective in fact there  
 was no proper sewerage at  
 all - the slops finding  
 exit by gutters or other  
 channels & often find their  
 way to the highway -

As regards Ashpits

There are several privies  
 to a common ashpit and  
 these ashpits frequently  
 were in a shameful

condition & often over three months elapsed between being cleared out, - and even when this was done there was always left at the bottom of the ashpit some water which stank fearfully in fact it was more offensive when the ~~empty~~ ashpit had been emptied - If this water had been gathering on a watertight floor ~~it~~ it would not have been so bad, but the floor was composed of ordinary bricks which allowed leakage sometimes even externally but certainly always into soil - This fluid permeated with animal impurities must

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have permeated the subsoil & this I think is another of the causes & one which even in future will bear its fruit. Very probably some of it will or may have found its way into wells or rivers which furnish drinking water.

### Gases of Putrefaction

Colliers are able to obtain their house coal very cheaply and one of the results is that it is not looked on as a luxury with the result that large quantities of this incompletely burnt coal is thrown out, and the influence of the sun leads to make it quite <sup>rich</sup> in gases which in themselves

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are putrefactive & tho this  
may not in itself cause  
typhoid fever yet it is a well  
known fact that putrefactive  
gases render animals specially  
liable to typhoid, why then should  
they not have some effect  
on human ~~being~~ <sup>being</sup>

### Typhoid Excreta

In cases of typhoid  
fever nursed at home the  
excreta altho we endeavour  
to render it harmless yet  
I consider enough precautions  
are not taken. We know  
~~know~~ how long the typhoid  
bacillus is capable of living  
under certain circumstances.  
Yet do we destroy bacillus  
when we desinfect the

29

stools and what about  
the urine and sputum  
which can be shown to  
possess typhoid bacilli  
are enough precautions  
taken with them? again  
it is wise to empty typhoid  
defecta into these middens  
as is done at present and  
when we consider that  
roads as I myself know  
one on the bank (or rather  
on a higher level) of the  
river "Don" has been made  
of night soil is it not  
more than likely that this  
is another source of infection

### Water supply

As regards the water  
supply during the first

outbreak it presented a brown scum when it stood & after rain was almost red. - filtration is almost unknown and indeed it is only after three years agitation that I have been able to persuade the people to boil the water before drinking. As regards the purity of the water I do not know enough tho' I am assured that it is of good quality now & according to Klein (Government Report 1895) it is only after the most searching examination that we are able to be certain that a water does not contain typhoid bacillus



be that as it may but  
 what I do contend is  
 that the water supply is  
 situated in quite the wrong  
 place - there are no taps  
 in the houses, the people get  
 their water from taps which  
 run up alongside of the midden  
 leakage is possible, however  
 even if water is pure is it  
 not likely that it will  
 become contaminated in  
 passing those ash pits. - I have  
 no doubt the water supply  
 was the cause of much of the  
 disease but the question may  
 arise if so why then did  
 hundreds escape well then  
 I must confess myself ignorant  
 unless (1) Immunity of certain people

we know that infection of typhoid is being - therefore particulate and its extreme delation may render large quantities to be given free so that many escape

Soil

The soil is of a sandy nature & according to Sir Charles Cameron of Dublin is more favourable for typhoid bacillus than clay soil & if as I have tried to show the soil gets permeated with those impurities surely then we have one of the causes

Emmanuations from middens

According to the structure of those shell houses if there is a gentle breeze blowing

say from the South well then this breeze will carry germs into the houses & certainly the odours from these ashpits while not a direct cause have an influence

Fly Causation

I have left this to the last because I feel strongly on the subject. - In the summer months those houses as a rule swarm with flies, these coming from those middens which are so handy & which may contain typhoid dejecta is it not likely that they when they land on the sugar & milk that they contaminate them. I see it

mentioned in Vol I of System  
of Medicine Allbutt that it is  
small insects as flies may carry  
infectious particles from typhoid  
patients to fruit & vegetables"  
well my experience inclines  
me to say it is probable  
& moreover is common in  
many cases, certainly I have  
epidemics every summer  
of several hundred cases  
of "Summer Diarrhoea" &  
leaving aside improper  
feeding & improper clothing  
I think flies are the  
next important factor, - &  
even if a fly only is able  
to carry a single germ yet  
on Prof Launcesters authority  
if it reaches the intestine

its capable of holding its own. I think those have been most of the important elements causing the outbreak but luckily after a certain amount of work we have made a start in the right direction namely we now manage to get the ash pits cleaned out every 6 weeks which is far too long an interval and when they are emptied Carbolic Acid is thrown in to sweeten and disinfect the bottom.

Individual Notes of Cases

Age In looking over my cases I find 19 years of age is about

the average, the disease occurred  
 in young persons of about eight  
 or nine years of age while  
 a corresponding number occurred  
 in young adults - one case  
 in an old man 65 years of  
 age and another in a woman  
 43 years of age. - In very young  
 children I have often seen many  
 cases simulating typhoid in  
 a mild form, with characteristic  
 diarrhoeas and tympanitis. Yet  
 the disease ran a very short  
 course. One case however  
 occurred in a baby (Chart 41)  
 who suckled from mother  
 and who slept with mother  
 during her attack of typhoid  
 and it also ran a mild  
 course. So my conclusion

regarding typhoid in children is that it is very rare and when it does occur it runs a mild course

Six There has been little to choose between indeed I think the males if at all were in the majority. - As regards sex I find looking over my cases that females on the average did better throughout the illness

Rash occurred in a little more than half of the cases. indeed in one outbreak it was scarcely present at all while in the other it was very much in evidence

Sudamina was very marked in four cases, while in one case

Erythema was present while  
Herpes was present in two cases.

### Alimentary System

In the case only  
started with beliousness and  
sickness (Wraithwell Chart 25)  
and this beliousness left  
headache behind which  
persisted throughout illness.

Tympanites was not common  
but warm fomentations  
relieved most of them. In  
the most severe cases a  
injection of warm water gave  
great relief - however it was  
very rare and I think R. Salo  
prevented its presence by  
preventing putrefactive changes.

Haemorrhage occurred in about six  
or seven cases but only in two



was it severe enough as to  
 cause anxiety. and in one of  
 these deaths took place  
 (in the Horton Chart) but whether  
 death was due perforation or not  
 I could not say, as I had not  
 seen patient for six hours  
 before death. - However one  
 feature which impressed me  
 in haemorrhage cases was the  
 nature of the pulse - its character  
 being quick and wiry

Worms - In one Case (Chart  
 a child on 10<sup>th</sup> day  
 passed a round worm

Nervous System

I was impressed with  
 the fact that a fairish  
 proportion of cases showed  
 great nervous prostration, in

fact what struck me on looking at the patient was the nervous expression of the face, in others the stupor and in some of those cases the patient had to be roused before he seemed to realize "You were talking to him."

- As regards delirium it was present in about seventeen cases in some it only was slight and only occurred at night while in others loud mutterings took place; - in one case a tippler (Dawson) the patient shouted all day & could not sleep at night owing to his belief that he was a groom and was told to wait and give orders

about the horses, in this case I gave Chloral but it only seemed to aggravate the delirium & as the pulse was quick & irregular I gave him Digitales and it improved so that in this case I think it probably due to impoverished circulation of the brain

Delusions one case (Alice Dwyer Chart 16) was a case of lipemania, she kept herself wrapped up in the bed clothes & trembled when anyone approached her, - one day her lover came to see her and was admitted in my absence, and even when he roused her up sufficiently to know who he was yet

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she could not talk coherently to him. - Three weeks after when she became convalescent she asked the patient in the next bed where her husband was.

+ after the woman replied she did not know this woman Duigby insisted that she had been married the day her lover had come to see her and that the nurse & the patient in the next bed were the bridesmaids & she insisted on this statement for some weeks even when quite conscious; and even then she was only persuaded after the greatest difficulty that it was a delusion.

- Muscular Cramps + neuralgia  
in lower limbs occurred in  
several cases but improved  
with movement and friction.  
Convulsions occurred in one  
case (Rogers Chart 25) on  
day & was cause of  
Death

### Complicated Case

Goodal Falkingham act 34  
(Chart no I) Complaining of Chill  
pain in back & legs. - shivering  
with cold sweats. Temp 101°.  
put to bed & put on Pot Bicar 6 - Vin  
Antimonial & ʒij Camphor. - he  
soon got well & went out in 4 days  
against my orders. Next week he  
took ill complaining of same  
symptoms. - Anorexia. Headache  
& weakness being now prominent

- On the third day diarrhoea set in with lymphocytes & enlarged spleen and on the tenth day rose spots appeared on chest & back. (At same time his child was suffering from typhoid & was being nursed at home) He was put on Salol & ran a nice course until 15th day when his left leg became swollen from ~~top~~<sup>thigh</sup> to toe. - It felt hot & tense, no pitting on pressure - no pain over liver or kidney right leg quite normal - Urine contained trace of albumen Hearts - weak but no abnormal sound - No Rheumatism in family & I could obtain no history of Syphilis. - He was put on Pot Iodide & Light Dray

Perchlor and leg diminished in size. - There was no enlargement over saphenous opening or any visible obstruction - Hot stupes applied + gave relief

On the 23<sup>rd</sup> day - suddenly patient seized with violent pain on right side, difficulty of breathing, - temp 102.6

Urine of 1035. - contained abundance of blood + albumen but later on hardly any passed

Heart began to fail + great difficulty in breathing + patient sank gradually. - What

troubles me is the accounting for trouble of leg. was it Clotting of vein? as there was nothing to show this or was



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It a pelvic tumour pressing on  
left sided vessels? but how  
would this affect lumbar pain  
since. - It could not have  
been cardiac or both legs w'd  
have been equally affected.  
Was it a Calculus of left  
Kidney? - The evidence  
goes to tend to idea of CLV  
inside vein still there was  
no redness along course of  
veins or tenderness specially  
over it. - Still the sudden  
pulmonary troubles incline  
to embolus but I am  
unable to form a definite  
opinion.

# Aetiology of Typhoid

Before criticising the different theories perhaps it would be as well to review them in order briefly, - The following I think include them all

## The Spontaneous Theory

Bacillary Theory which subdivides into two items whether Typhoid Bacillus is only cause or whether Coli Communis is really cause or rather whether Coli is just Bacillus Typhoid in another form

## Auto-Intoxication Theory

Typhoid as precursor of Continued fever.

That typhoid is a contagious fever is now accepted tho

for a long time this was  
 disputed by Chomel, - Audral  
 & Louis but on the other hand  
 we had Leuret (1828) Bretonneaux  
 1829 & Gendron 1834 maintaining  
 its contagiousity and it was  
 only in 1834 that the memoir  
 of Piedrach of Dinan furnished  
 actual proof. - Since then it  
 has been accepted generally  
 & it is easier seen in country  
 than in towns

Pathogenic Theory of Murchison (1858) is  
 a perfect expression of his side  
 he says "The infectious element  
 was supplied by any kind  
 of animal matter in state of  
 putrefaction" & as head of Spontaneous  
 origin he says. that "Disease  
 can be produced quite

independently of any antecedent case by fermentation of faecal matter & perhaps by fermentation of other organic matter

Budd's Theory (1856-75)

maintains as a part of "theory" that each manifestation of typhoid is due to an antecedent case & he taught principally that the morbid principle being eliminated with diarrhoea stools could disseminate contagion far & wide & could also impregnate soil & he also showed transmission by soil & water. & further that single source or origin was invariably followed by one of same disease

## Auto-Intoxication Theory

Professor Peter & Steeb are chief exponents of this theory.

Needless to say both regard causation as "Home Manufacturing

Briefly it is - They interpret spontaneity by assuming that every person carries in intestinal tract a quantity of putrid material which under normal circumstances, is constantly neutralized as fast as it is formed but under certain circumstances this material may cause typhoid fever. - So really it is an auto-typhisation or self infection due retention of effete material in fatigued organism

Criticism

If this theory is correct then typhoid should be an everyday

occurrence, as hundreds  
 of people all their lives  
 suffer from constipation & the  
 effete matter being absorbed  
 into organism must produce  
 poisonous effects but is there  
 any relationship between this  
 & typhoid, - I think

Bacteriology has exploded  
 this theory & at present time  
 the consensus of medical men  
 are in favour of microbial  
 origin & so biology of microbes  
 becomes interesting study.

As regards theory held by many  
 medical men especially  
 army surgeons amongst whom  
 are Mackie & Gore who regard  
simple continued fever as  
a mild form of typhoid

and probably as precursor  
of a severer form of typhoid  
to follow & who say that it  
ought to be treated by preventive  
means.

Criticism

Probably some of these cases  
may be relegated to category  
of typhoid but surely there are  
other causes for instance  
(1) In tropics & Egypt statistics show  
continued fever occurs in  
June & July so this is after  
and not preceding the typhoid  
season.

- (2) Mortality of these cases are nil
- (3) Excessive heat & with occurrence  
of heat apoplexy
- (4) Duration of patient in hospital  
which averages 9 days

The discovery of typhoid bacillus by Eberth did much to settle the vexed question of aetiology of typhoid. — At present we are divided into two classes

(1) Those who maintain that Typhoid bacillus (Eberth's) is specific & is only cause of typhoid

(2) Those who dispute this & claim origin *de novo* & the other class who dispute specific value of Eberth's Bacillus & represent it as a transformation of Bacillus Coli Communis & if this is so then surely we have a resurrection in the field of Bacteriology

— Bacteriologists have been able to determine & show differences between those two & of these the following is a brief account



Typhoid Bacille

- I No reaction of Indole
- II Causes no formation of Gas in media containing Sugar
- III Does not curdle milk
- IV Does not grow in bouillon containing a  $\frac{1}{1000}$  part of formalin

Coli Commune

- I Gives reaction of Indole
- II Causes abundant evolution of Gas in media containing Sugar
- III Ferments milk in 1-2 days at 37°C.
- IV Grows in Bouillon containing a  $\frac{1}{1000}$  part of formalin (Schild)

Now that we have seen the differences let us consider the matter. I try to help us reaching a conclusion.

Criticism on diff. Theories

According to Roudet & Roux of Lyons the Coli Commune without losing its general botanical character it can acquire within

The human system alone nature  
 it becomes in fact Eberth's Typhoid Bacteria  
 - Their researches show that it may  
 exist in harmless condition in  
 body yet it can become virulent  
 & infective when introduced into  
 water hence they conclude  
 that not only typhoid infection  
 but simple faecal pollution  
 of water may produce typhoid  
 to those who drink it this  
seems to favour Murchison's  
Theory of Pathogeny but really  
 I think when we consider the  
 matter it is different as in  
Murchison's Theory it is assumed  
 that toxic principle of typhoid  
 may originate in decomposing  
 faecal matter but according  
 to Roulet & Rous a harmless

Saprophytic organism acquires  
 by mere contact with water new  
 infective properties. - We know  
 according to Local Government  
 Reports 1894-96 & from experiments  
 by Klein & Percy Frankland  
 that certain inorganic elements  
 as salt, nitrates & potassium  
 salts favour vitality & multiplic-  
 -ation of some microbes. - So that  
 the fact that the Coli Commune  
 by mere contact with water  
 irrespective of its nature acquires  
 infective properties is a fact  
 that has not been explained  
 satisfactory - These organisms  
 maybe harmless until <sup>they</sup> undergo  
 transformation in the system or  
 it may be immediately infective  
 & such is nearer akin to what.

we know of the microbes of malaria than to those of Gonorrhoea as in the latter soil & water have little to do with recovery to these & many other infective diseases (as measles etc) but I think it has much to do with intermittent & typhoid & perhaps also with dysentery —

No doubt Budds theory is too limited, but when we consider the spontaneous theory I think it also falls short — when we look around us do we ever see nature work by this means, do flowers trees or corn spring from nothing? Can we realize that the origin of typhoid is spontaneous or more definitely that it arises

on its own account without any external influence. Yet many military surgeons & others, especially medical men in country from clinical reasons cannot accept Budd's Theory in its entirety while many who like myself see cases arise sporadically even after the most careful investigation as to origin often fail yet we cannot accept the de novo origin - Military surgeons of experience in India, Egypt West India's claim with Maiston that Budd's Theory is inadequate to explain the

(1) extreme vulnerability of young soldiers in India

(2) Immunity of natives &

(3) impossibility of tracing one case

from preceding one as cases  
 often have occurred in isolated  
 spots which previously have  
 been <sup>un</sup>occupied hence they  
 claim for spontaneity but do they  
 consider trying climate, - filthy  
 natives, - & the fact that  
 the bedding & clothes of many  
 of the soldiers who died from  
 typhoid are sold to others  
 without proper disinfection &  
 even if done is the disinfection  
 sufficient to kill germs, as  
 we know these can live for  
 long periods, - so that the  
 whole matter becomes reduced  
 into (1) whether typhoid bacillus  
 alone is accountable or  
 whether (2) Coli is Bacilli Typhoid  
 in another state

Latham, - Lesage + Macaigne  
 (Bacterium Coli Commune Son rôle dans  
 la pathologie Paris 1892) all obtained  
 Coli in large numbers in cases  
 of typhoid & in typhoid they found  
 they multiplied in an extraordinary  
 way but we often get Coli  
 present in other diseases ~~but~~ <sup>while</sup> we  
 never get Typhoid Bacillus in any  
 other disease so that I think  
 there is little doubt as to  
 specificity of "Typhoid Bacillus"  
 - Bacteriologists & pathologists  
 have as yet never been able  
 by laboratory experiments to  
 prove that Coli + Typhoid Bacillus  
 are the same. -

Conclusion

Granting that bacteriologists  
 have found Eberth's Bacillus & that

so far it has never been found present in any other disease, yet when we know the differences in vitality of microbes how some soon perish when detached from animals in which they have been developed while others are more persistent & that in some the spores long retain like vegetable seeds their vitality & power to develop under suitable circumstances, as when supplied with suitable nourishment material as potato & gelatine - so that we may infer that pathogenic microbes may when detached from animals become deposited by accident in dead organic matter capable of affording suitable nourishment to them, - but from our knowledge



we may assume that the great majority of pathogenic microbes would soon perish if the animals with which they were associated ceased to exist & it is moreover certain that the microbes which produce some diseases as Malaria ~~would~~ continue. No doubt bacilli producing all kinds of intermittent fever have an independent existence & they are found in soils of many districts. These organisms clearly belong to soil yet we have them producing specific diseases in man.

- I think Woodhead's Theory (Bacteria their products) - keeps us pretty - he regards all bacteria as primary saprophytic (ie having independent existence apart from animals) & that

under altered circumstances  
become pathogenic & prey on  
tissues -

While both sides stand apart  
each claiming their correctness  
do they not really fit into  
each other & do they not come  
into line if we lay aside  
the necessity of contagion by  
one single specific bacillus &  
admit possibility of the  
evolution of disease producing

properties the successive  
generations & be entertained

Klein while showing differences between  
Coli & Typhoid Bacillus & in all  
his bacteriological examinations  
he has never been able to observe  
any evidence of transitional or  
intermediate forms between the two

still he does not deny possibility  
 of their existence both morphological  
 & cultural - but because  
 Specifists have not been able  
 as yet to communicate the  
 one with the other why should  
 they maintain that they are  
 two definite & separate species.  
 - In my mind the whole question  
 of specificity in regard to the  
 relationship of function of time  
 & environment is a most debatable  
 ground even in regard to  
 organisms whose complexity  
 of structure makes modification  
 of type far more difficult  
 than in case of those now  
 under consideration -

again & I think more important is fact  
 that claim for non specificity

of typhoid rests only on bacteriological  
 grounds evidence while there  
 is a large & increasing number  
 of observers (especially Medical  
 Officers of Health & Country practitioners  
 of large experience) who make  
 this claim on clinical ground  
 quite apart from overwhelming  
 considerations founded on general  
 force of the Great Law of Evolution  
 in regard to the minute  
 organisms with which the bacteri-  
 -ologist has to deal to which every  
 day helps to strengthen the  
 argument — again is it  
 not possible that these microbes  
 may exist in nature in partially  
 developed forms & under certain  
 circumstances may impart  
 protection without disease arising

when they gain entrance into  
 animal system under  
 ordinary circumstances may  
 produce more or less obscure  
 symptoms of disease incapable  
 of being referred to any known  
 disorder. — Much I think  
 depends on soil (i.e. constitution  
 & hereditary proclivities of the  
 animal on which the seed is  
 sown) — This may seem  
 contradictory to the rigid specific  
 dogma but surely it seems  
 more in accordance with  
 natural biological science  
 generally, as recognizing that  
 amongst microbes as amongst  
 plants & animals the inclusion  
 of every of every individual among  
~~some~~ <sup>certain</sup> species divided off from

each other by fast & hard  
distinctions is not always  
possible - I think it recognizes  
the greatness of the subject  
& does not require that every  
manifestation of zymotic  
disease should be capable  
of being recognized and labelled  
as already known because  
it must belong to one of the  
limited recognized species and  
I think it also helps to explain  
differences in type, in manifestations  
& in ~~infectiousness~~ that characterize  
certain diseases as seen in  
temperate and tropical climates  
as seen now a days & in time  
gone by.

