Thesis

for the degree of M.D. Edinburgh

The Birkenhead typhus epidemic

of 1890-91

by

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I propose to treat the subject of this thesis under three heads:—

I shall make a few remarks about typhus epidemics in general, with some suggestions for the final extinction of epidemics of typhus.

II I shall endeavour to show, by a description of the existing Birkenhead Fever Hospital site management, how a Fever Hospital should not be constructed and maintained.

III I shall give a summary of the course & character of the first typhus epidemic. I shall not venture to describe the general course & symptoms of typhus fever, in the face of Dr. Murchison's classical description, but I shall narrate two or three very interesting cases, that occurred once during my tenure of office as Medical Superintendent of the Birkenhead Fever Hospital. I shall add a few notes on treatment.
Part I.

Remarks on Typhus epidemics in general, with some suggestions for the final extinction of epidemics of Typhus.

It is to be hoped, that, with the steady advance of sanitary science & medical science in executing its beliefs, epidemics of Typhus fever will become things of the past. Smallpox, that terrible scourge, has been almost annihilated by the beneficent discovery of Jenner & it is conceivable, may more, possible & probable, that Typhus fever may become very rare, though by entirely different methods of procedure.

To explain my meaning let us call to mind the chief causes of Typhus fever these can be removed or avoided, which would prove a much more scientific & satisfactory result, than the most enlightened treatment of Typhus cases that have actually arisen.

The chief causes, with which alone we need concern ourselves, are 1. Reckless
(a) Starvation & more important (b) Clove-
crowding, associated as it usually is with deficient ventilation and personal uncleanliness. II. Exercising—A specific poise. Syphilis is a disease of the lower strata of the working classes in towns. Here, a man with a wife and family of 4 or 5, having very moderate wages, rents a single room in which the whole family lives day and night. There is no such convenience as a bath in the house; as a rule, the people relieve any free use of water for the purpose of washing. The supply of clothes is meagre. If the children have shirts, they sleep in those they wore through the day and also in their flannels. So often they have to retain all their day clothes through the night. The changing of their underclothing is a thing of the rarest. The result is, that the clothing gets saturated with the cutaneous exhalations, which decompose. The result is a nauseous, reeking mass, which offends the nostrils of those unacquainted to the effluvium and forms a fine medium for the growth of germs.
were that all, they might still escape typhus, but there is in addition almost complete absence of ventilation. During cold weather, as the supply of coal is limited, the heat has to be husbanded to the utmost that is accomplished by keeping the door and window shut by filling up every crevice by which fresh air, their greatest safeguard—if they but knew it—could enter. This also explains the fact, that typhus is most prevalent during cold seasons. The particulate calculations from their lungs get deposited on the walls and furniture and afford further pabulum for the growth of micro-organisms.

Starvation or want of sufficient nourishment is not nearly so important as overcrowding in the production of typhus. Starvation, in a well ventilated house, with sufficient cubic space could never lead to typhus. But, overcrowding of well fed people, as described above, often results in typhus fever, as was the case in the late epidemic in Boston. It may be classed with ab-
ject fear of the disease as a predisposing cause. Any thing that lowers the vitality or disease-resisting power of the organism predisposes to typhus.

Nevertheless, starvation plays a most important rôle in a typhus epidemic, of which the predisposing to the disease is of minor consideration. Typhus being essentially a disease of profound prostration, the reduction of the strength by previous want of food has a marked effect in increasing the mortality percentage.

The mine is now prepared, the fuse laid, but no explosion can occur till a spark is added. This comes in the shape of the exciting cause, a specific poison. No one who has followed the results of late bacteriological researches seriously believes in the existence of causal activity of the tubercle bacilli; the bacillus of Aurivax & Koch's caseum bacillus, can doubt that this is a micro-organism.

This poison is believed to be exhaled from the skin flanks of patients suf-
faring from typhus. Introduce such a patient into the room above described.

The air being stagnant, the products of cutaneous excretion become more and more concentrated, until the amount of typhus poison inhaled by the other inmates is sufficient to produce typhus in them. It is not, however, necessary for the production of typhus that such a patient should be placed in the overcrowded room. Many cases, investigated by accurate observers, have occurred, in which it could not be shown that the disease had been produced by direct or indirect contagion from a person suffering from typhus. In these cases, therefore, the poison has been described as arising "de novo". At the present day few will be found to have the hardihood to assert, that the genus of typhus can be produced from mere chemical agencies, such as decomposing garments or cutaneous excreta, without the presence of germs to multiply. It is really meant that
the case, not the poison, arises de novo, i.e. without traceable connection with another case. There must be a connexion, however, traceable or not. The genus, which by proliferation produces a sufficient dose to cause typhus, must have come from some previous case of the disease. Of course there are typhus germs in the air, but it is not likely, that a sufficient growth of the germs that infest the clothes of anyone could occur, to produce the disease. A very feasible explanation is, that the poison is carried by clothing. Amongst the class chiefly affected by typhus, pawnage of clothes is a very general custom. Now, suppose the father of a family, the bread-winner is struck en with typhus. He is confined to bed. The money soon runs short, for that class is not provident. The furniture is pawned, there lies outer clothes, which he does not require & which are by this time impregnated with the poison, are pawned. The man probably dies. His clothes are not redeemed, but lie in a stuffy place, along with other clothes.
The poison is preserved within them. The epidemic subsides at some future time thereon, in proportion with the typhus poison, and brought by some one who contracts the disease from no recognisable source. The poison is said to arise de novo.

Having now given a brief description of the principal causes of typhus, let us all endeavour to show how the disease may be obviated.

Ireland is the home par excellence of typhus; probably on account of the frequent distillation from failure of the potato crop, on which they mainly depend for food, and on account of the utter disregard of sanitation, personal cleanliness evinced by the lowest classes. Here then, in its favorite habitat, the disease should be vigorously attacked. The Irish should be educated to the cultivation of other foodstuffs besides the potato, which is so prone to disease. Further, the government should render
timely aid, till they have been trained to take better care of themselves. It is to be hoped, that the vigorous measures adopted by the Chief Secretary during the past winter, to relieve the distresses in the west of Ireland, will avert an epidemic which might otherwise have been expected.

In this country, extreme starvation is not likely to occur as in times past. The great cause here has been strikes, but, owing to the very complete organisation of trade unionism, any body of men striking will be kept from actual starvation, by assistance from unions of the same or allied trades.

It would be striking at the very root of the evil, if the authorities in towns and cities passed bye-laws, ensuring sufficient cubic space per unit of the inmates, not only in common lodging houses, but also, in the houses of the working classes. It would also be necessary to frequent institute frequent systematic visiting of the houses, to see that the regulations were strictly adhered to.
by this action, entailed on a man with a large family in respect of rent, it would be incumbrant on the corporation to erect houses for working men, at a rent which would merely cover the interest on the money expended in building them & fair wear & tear. It would be difficult because efficient ventilators, as the ventilators would almost certainly be concluded in some fashion or other.

Of more immediate practical importance is the judicious management of a typhus epidemic, when it has actually come into existence. These are four important points to be attended to in this connection & the omission of any one of these would seriously militate against any attempt to cut short the epidemic. These are:—

I Notification.

It is much to be desired, that all towns will adopt the act for the compulsory notification of infectious diseases & that they should bring pressure to bear on the medical men, to enforce...
the notification of such diseases as soon as the case has been diagnosed. I have heard several eminent practitioners declare, that he left over his notifications till he found himself in a particularly good temper & then sent them all in in a batch. Such a spirit, were it to become general in the profession, would largely diminish the benefits derivable from the act.

And here, at the very outset, we are confronted with a serious difficulty. It is an ineluctable fact, that the great majority of medical men are unable, or at least fail, to diagnose typhus when they meet with it in practice. The reason is not far to seek. Comparatively few men, on the completion of their curriculum, have had the opportunity or at least have availed themselves of an opportunity to study typhus. A student, unless he were very enterprising, would not think of attending the fever wards, except during the last year or two of his course, where his attention was specially turned towards clinical
study. During that period there may be no epidemic of typhus and therefore no material to study. Lastly, at that stage of his studies, after three or four years of hard work, the student is reduced in strength, highly susceptible to the poison of typhus and in unfavorable condition to pass through so serious an illness. The result is, that few, except those who have had residence in infectious hospitals or workhouses, know much about typhus till they are confronted with it in actual practice and then it is diagnosed as typhoid, till some more practiced hand discovers that there is a typhus epidemic. I have been told by a Local Government Board Inspector, whose special duty it is to trace to their sources epidemics of typhus, that it is not uncommon for typhus to rear riot in a corner under the name of typhoid, to spread to a neighbouring town under the same designation and sometimes never to be traced, before the real nature of the disease is discovered.

It has been suggested, that each medical student, before becoming qualified to
practice, should be obliged to produce a
certificate of leaving some a certain num-
ber of cases, just as in midwifery. The
objections to that are, that there is not
a constant supply of the material for
study & that it would compel everyone,
who wished to practice medicine, to place
his life in considerable danger, although
that ought to be no deterrent to anyone
induced with the true spirit of the
profession.
I would suggest another means for
the early discovery of the presence
of typhus in a town. The mistake is
almost always made between typhus
typhoid. Each corporation, then, should
pay a reasonable salary to a resident
medical man who has some acquaintance
with typhus. For this he would
be bound to make one or more visits
to each case notified as typhoid, so
that, the question of typhus being al-
ways before his mind, he would be
on the look out for the disease & an
epidemic might be prevented or cut short.
For it is not exactly the intrinsic dif-

Facilities of the diagnosis between typhus and typhoid that lie at the root of the evil are such that, where there is not known to be an epidemic of typhus in the town, that disease is comfortably shelved as it were, does not come within the range of practical politics.

II. Compulsory removal to Hospital.

But notification is only a preliminary in the management of an epidemic. Every case of typhus, as soon as it has been notified, should be removed to an infectious hospital, by a magistrate's order if necessary. The disease is almost limited to overcrowded slums. Treating the patient at home is sure to lead to the communication of the disease to the other members of the family. If by chance they occupy two rooms, an attempt to make to isolate the patient in one of them, the overcrowding is increased by the rest of the family being restricted to one room. Further, curiosity tempts each member of the family to go into the sick room several times daily, thus running frequent risk of taking the disease.
I shall here dwell on the effect of empyema removal & the avoidance of its spread in the head epidemic.

III. Burn the clothing.

The clothes worn by the patients are saturated with the poison & are a fertile source of infection. Formerly, patients convalescent from typhus used to spread the disease, when admitted into the convalescent wards with patients recovering from other diseases. This occurred not from the continued exhalation of the poison from their skin ulcers, but because they had renewed the clothes they had worn before admission, and which had not been disinfected or inadequately so. The clothing is often so greasy & impregnated with filth that it is improbable that it can be thoroughly disinfected. The result is, that if forms a centre for the further propagation of the disease. Therefore the patient's clothes should be burnt & replaced by the corporation.

IV. Thoroughly cleanse the house.

When a case of typhus has been removed
to the Hospital, the other inhabitants of the house or tenement, having had their clothing thoroughly disinfected, should be supplied with a temporary residence by the corporation, till the house has been rendered safely habitable. All the rooms should be fumigated with sulphurous dioxide. The bedding and hangings should be thoroughly staved over doors and windows left completely open for some days, to let the fresh air thoroughly dilute any remaining poison. As a further safeguard the ceiling and walls should be scraped white washed with woodwork, floors & furniture thoroughly washed with a solution of carbolic acid. The house would then be perfectly safe to live in.

Were these measures strictly carried out, whenever an epidemic was found to exist in a town, believe it would be speedily stamped out.

Since writing the above, I heard, in conversation with an old practitioner, the case of a pawnbroker's wife
who contracted typhus from a bundle of clottes, belonging to a person suffering from the disease, which had been pawned with her. Had she, at the moment of receiving the clottes, been insusceptible to the poison, it is probable that the clottage would have been laid away until some one, who would have contracted the disease, as in the supposition case I before described.
Part II

By a description of the existing Blackfriars Fever Hospital site and management, to show how a Fever Hospital should not be constructed and administered.

The Blackfriars Fever Hospital has been in existence some 15 years. In the first instance it was a very modest affair, consisting of two semi-detached villas in a dilapidated condition, belonging to the corporation. Partly on account of their condition and partly because they were on the confines of a densely populated part of the borough, they could not be let; but were considered eligible for the purposes of an infectious Hospital. These villas were deemed fit for 8 patients, & the necessary attendant, & served as the Fever Hospital for two or three years, where a pavilion & contain 10 beds & necessary conveniences was built & over a second of similar dimensions was added. These were greatly superior to the old villas, but even they exhibited considerable contempt
for sanitary laics. The walls were their
the inner surface, instead of being cement-
ed ochreott, was simply whitewashed;
solid, between every two tiers of brick,
was a considerable ledge or crevice for
the ready lodging of dust and miers. The
windows were well fitting, that in
boisterous wet weather a considerable
quantity of water was forced through
the apertures, with the result of occa-
ional pneumonia & sometimes whooping
cough or bronchitis. Apart from open windows,
there was not sufficient ventilation.
The soil pipes were imperfectly trapped,
which lead to unpleasant results and a
certain occasion, to which shall be
referred. One side of the hospital was
separated from a public thoroughfare
by only 4½ feet, instead of the regulation
30 feet. The pavilions were separated
by too short a space compared with
their height. The walls however were
in an infinitely worse condition. They
were so ill repaired, that, during a storm,
most of the vessels in the house were
under requisition to catch the water.
falling from the ceilings of the upper rooms seven or more in the story beneath.

The mortuary communicated with one of the rooms by a crevice. This was discovered during the fumigation of the mortuary with sulphur dioxide, whereby a night nurse sleeping in the room in question was nearly suffocated.

The main sewer of both villas ran underneath the floor of one of them.
A lead pipe, carrying the water from the top of a bow window, passed un-trapped into a side branch of this sewer. As a result, a bedroom was flooded with sewer gas twice a day during high tide, through the window immediately above the bow window. During my tenure of office in the Hospital, before I discovered it, the health of these nurses was seriously impaired by it. It may account for the occurrence of typhoid fever in one of them.

This Hospital was administered in a fashion entirely befitting its construction. After various miscalculations, the services of an old Crimean warrior and his wife were
secured. For a moderate consideration, they undertook to keep in thorough order two villas of six rooms each, two pavilions containing 20 beds, to each the patient, food, &c. the entire nursing day and night, so long as there were not more than three male as many female patients in hospital. They were a highly respectable couple, but had no previous knowledge of nursing & being quite illiterate, had scarce the bottles of medicine to the patient, to get them to read the names & directions on the labels when the time for administration of the medicine arrived. When the number of patients exceeded three or either sex, the cantaker was empowered to engage nurses to assist. What more natural than that he should engage his own relatives? Accordingly, during the past 11 years of his main tenure of office, the nursing has been done exclusively by himself, wife, & children necessary, their two daughters, who as a rule nursed during the day & returned to their own homes at night, the manifest danger of spreading the infection.
The bedding was in a sad state. It had been in use for 15 years, as the machines were exceedingly worn; the mattresses were usually stained and saturated with the excreta of successive patients.

Where, for the first time, the necessity for trained nurses was recognized by the deputy medical officer during the late epidemic, the two trained nurses who were engaged, refused to serve in such a den. Their successors, more deeply imbued with the professional spirit, spent 48 hours in scrubbing floors, in the intervals giving exercise, before their sense of duty would allow them to take any rest. Their health consequently suffered, they both speedily contracted typhus fever, to which one ultimately succumbed. Two medical men attending the hospital at this time were also taken with typhus.

It was a thing not unknown, for a corpse to be removed from a bed, another patient put almost immediately into the bed, without so much as the linen being changed.

The last point in administration
which I shall touch, is the treatment of the patient's clothing. Whenever a patient was admitted, his clothes were at once removed to the mortuary, where they remained till he was sufficiently recovered to sit up. Thence upon the clothes were returned to the patient in the same condition in which they had been taken from him, except for an increase of virulence. It was only when the patient was ready to leave the hospital, that the clothing was disinfected. Happily for the working classes, most of the above facts were freely discussed in the public press. The existing hospital was condemned by a Local Gov. Board Inspector. It is said will, therefore, soon possess a new infectious hospital, worthy of her present & prospective importance.
Part III

A short summary of the B'head epi-
demic of 1890-91 — Some notes on treat-
ment — A few interesting cases.

This epidemic, as is usually the case,
serves to have existed for some months before its true nature was
recognized. The first cases to be
diagnosed, were two patients who had
been admitted to the General Hospital,
under the supposition that they were
suffering from typhoid fever. Suspec-
tion of the diagnosis was first aroused
by the superintendence of delirium; a more
searching examination revealed the fact,
that they were suffering from typhus.
In the Fever Hospital,
attention having then been directed
to the subject, it was noted, that an
unusually number of cases of typhoid
fever had been notified during the
preceding months, and the occur-
rence of cases of undoubted typhus,
in some where, previously, supposed cases
of typhoid had occurred, showed that
many of the cases notified as typhoidal had in reality been cases of typhus & that what proved to be an epidemic was by no means in its initial stage. Necessarily, therefore, the epidemic could not be traced to its source.

This is a favorable instance, to show what benefit might have accrued, if each case of typhoid had been investigated as soon as notified. In all probability the presence of typhus would have been ascertainable a few or three months earlier. By judicious management, the epidemic might have been averted. If the medical men objected to leaving their diagnosis of typhoid investigated & criticized by an official, it might be made an instruction from the Health Committee, that whenever a practitioner believed he had to do with a case of typhoid, he should call in a medical friend, who had acquaintance with typhus, in consultation. The form of notification would then be signed by both medical men & the Corporation would pay a suitable fee to the consultant. That would undoubtedly be a little costly, but
less expensive in the long run than having to cope with repeated epidemics of typhus. Besides, it would lead to a considerable saving of life, by crushing down typhus.

During the first two months after the recognition of the epidemic, several cases were treated at their own houses, where there were no proper means of isolation, with the result that the disease continued to spread rapidly.

Then, when the scandal about the state of the Hospital appeared in the public press, the people became terrified to enter the wards and positively refused to do so. The authorities, however, seeing that this would lead to an indefinite spread of the epidemic, proceeded to remove all cases of typhus to the Hospital, obtaining a magistrate's order for that purpose in cases of necessity. Within about six weeks, the epidemic seemed at an end. Between the December 21st of the month, no fresh case was notified. The January 1st 1841 a case was admitted, which demands some discussion. The boy had no intimacy
with the family of the case admitted on Dec. 8th, therefore, could not have got the disease from it, which was the apparently latest opportunity in the Borough of contracting infection. The case admitted on the first day of the year came from a house from which another case had been removed on 1st December. After the previous case the house had been desinfected. As the boy was in the 5th day of his illness, he must have had an incubation period of 26 days, if he contracted the disease directly from the patient of 1st December. There are two facts however that militate against the acceptance of so long a period of incubation. The husband of the woman who was removed on 1st December was allowed to visit her in hospital on the 7th, when she was dying. If he carried the infection home, that would still give the next case an incubation period of 19 days. It is very improbable that the contagion was so carried, because the utmost precaution was used during the interviews, which lasted only five
minutes. The ward was well ventilated, the man was provided with a hospital cloak, which reached from his neck to his heels. She was not allowed to touch the patient or bend over her. The real source of infection in this case, I believe, to have been the house, which, as I shall show later, had been imperfectly purified after 1st December. The same remark applies to the next case, which was removed on 15th January, from a house in which a case had occurred on 8th December. Allowing that the patient was a week ill before removal, that would still leave an incubation period of one month, on the supposition that the disease was contracted from the patient removed on 8th December. The contamination may have been got either from the imperfectly disinfected house or from the patient of 8th December, who returned to the house a few days before the fresh outbreak, whose clothes may not have been properly disinfected at the hospital.

Now occurred a case, which shows
necessity for early notification & removal. A medical man, who evidently thought that typhus could be quite well treated at home, failed to notify a case, with the result that three others in the same house acquired the disease & when it began to spread again, was once more almost exterminated by vigorous action on the part of the authorities. The last appearance of the epidemic was in the simultaneous appearance of three cases & soon afterwards a fourth, among patients in the General Hospital for other diseases. This could be accounted for in no way, but on the supposition that the contagion had been introduced by the visitors to the patients.

The epidemic has been a mild one & there have been few complications & sequelae; the reason probably being, that work has been easily got in & lack of late food has consequently been plentiful. The great predisposing cause of overcrowding was, however, present.

After the real nature of the disease
was recognized, 82 cases occurred. Any conclusions drawn from so small a number must be very far from exact. Yet, after making due allowance for that, I think something can be learned from the statistics I shall submit.

The mildness of the epidemic is shown by the fact, that of more than the half of the total cases, whose ages were 25 years or under, not one died. How comes it then, one would ask, that the mortality percentage for the whole epidemic should be so high as 18.7 per cent, which is within 1 per cent of the average mortality of mild and severe epidemics collectively? That question is adequately answered by an analysis of the cases in the two periods. 1st while the nursing was done by incompetent hands, and 2nd, while it was done by a sufficient staff of trained nurses. Curiously enough, just over half of the total number occur in each period, making the comparison more easy. Of the 111 patients of the first period 11 or 26.5 per cent died, or, omitting the 9 who were treated at their own homes
wilt n deaths, 10 or 31 percent died. While of the 44 patients of the second period, who were almost all treated in hospital, only 4 or 9.9 percent died. It is but just to remark, that a larger proportion of the patients of the first period than of the second, were over 30 years of age; but that is not by any means sufficient to account for the difference.

The average mortality of patients between 30 and 55 years of age, in the London Fever Hospital, has been 30.5 percent. In Bland, of the 9 patients between 30 and 55 (there were none older) who were treated in hospital during the first half of the epidemic, 9 or 56.3 percent died. As the epidemic was a mild one, the mortality, instead of being nearly double the average, ought to have been considerably under it. After making full allowance for the smallness of the numbers dealt with, it is still abundantly evident, that the mortality was excessively high during the first period. Explain these results in this way. The patients had been tolerably
...of the warfare, the experimentation and progress.

End: The war was not just a conflict of armies, but a struggle of ideologies and values.

The peace that followed was fragile. The world was not ready for a new order. The

Agreement reached was not sufficient to bring peace.

Peace was not just the end of the hostilities, but a beginning of rebuilding.

The world was not ready for a new order.
with a view to preventing overcrowding, have, within the past few years, passed a by-law constituting every house that contains more than one family a lodging house, which must be registered. These houses are thereby brought under the surveillance of the inspectors, who can discover at any time, whether a house or tenement is overcrowded. As few houses here consist of less than 20 or 25 rooms, there is little danger of overcrowding when a single family occupies a house. This brings matters nearly up to my suggestion of systematic investigation into the numbers inhabiting all houses in the lower parts of large towns.

Hitherto the borough has not had a quarantine establishment for the inmates of infested houses. Accordingly, the process of disinfection of houses has been very defective. The method has been, to restrict all the inmates of the house to one room till the rest of the house was fumigated. This is to disinfect that room. The inconvenience of
such a procedure are obvious under quite impossible the thorough process of disinfection imperatively demanded by the highly infectious nature of the disease. The evil effects of this are shown by the two cases I cited in speaking of the course of the epidemic.

When the new hospital is built, the present one will be utilized as a receiving house. Other infected houses will have a chance of being properly purified.

My connection with the hospital began when the second deputy medical dept. was attacked by typhus. There was a difficulty in finding a successor though, after so much sickness amongst the staff (two medical men & two nurses having become affected with the disease within three weeks), the post was not without risk, I did not desire that the traditions of the University of which I have the privilege to be an alumnus, permitted me to refuse the post for the purpose of avoiding the danger.
My predecessor in the post left me a legacy of 15 cases, during my two months of office, I admitted and treated to a termination a like number. One would not expect to find much variety amongst sixty patients during a mild epidemic. But I had the good fortune to find amongst those a few unusual cases, which will, I trust, make the remainder of my paper not without some interest.

The effects of a gale.

During the night of November 9 the preceding and succeeding nights, the district was visited by an unusually severe gale. This had a most marked far-reaching effect on the inmates of the Hospital.

Owing to a very high tide interfering with the outflow from the sewers and heavy rain, an imperfect trap on a sewer within the Hospital premises was forced. The sewer gas was forced into a window and into the corridor uniting the two pavilions. Here, the smell was decidedly offensive, but, by the time it had
reached the pavilions, being diluted with air, it was not perceptible. She first suffered from it was seen of the nurses who was exposed to it in the corridor. She was a woman of relaxed fibre whose had very hard work during the fortnight she had been in hospital. On the previous day she had an attack of faintness and trembling. The sewer gas acting on her in a state of depressed vitality, resulted in the immediate effects of headache, sore throat, cough, tongue dry and diarrhoea. With a day's rest in bed, generous diet, plenty of exercise in the fresh air & for 2 days' exception from duty, she regained her health & spirits as it appeared as if she had completely recovered from the effects of the sewer gas. But the effect was more disastrous than had been suspected; for on Nov. 19th, 10 days after the gale a 20 day average incubation period, she was struck with typhus; the poison which she had previously resisted, leaving probably obtained power over her during the state of depression caused by the sewer gas. I shall describe her case at full
length later. The other nurses, who were in perfect health, were totally unaffected. Driving to its position, the pavilion for female patients had one side exposed to the full force of the gale. The windows on the sheltered side were open for ventilation; owing to the windows on the exposed side fitting very ill, there was a gentle draught across the ward, in the direction of the gale. As the sewer gas diffused into the ward, it was gradually carried towards the side with the open windows, through which it escaped. Therefore, although the ward was full of patients, only three who lay nearest the source of the gas on the side of the ward towards which it was blowing, were affected by it.

The gas being diluted with air had not an immediate effect, as in the case of the nurse who inhaled it in a concentrated form in the corridor.

Two of the cases were mild ones, although they continued in a favorable condition during the day of the gale, they were much depressed on the following day.
The depression was only temporary, passing off in 24 hours, without further affecting the course of the fever, which terminated favorably three days later. The third case was a woman of 52 years, who had till that time done well, but became very ill from the effects of the gale. I shall detail her case when speaking of digitalis.

The male ward was so well screened by the other, that there was no through draught in it. There were only 5 patients in it & the effects of the sewer gas was not discriminated. Only one case was affected, which I shall now describe.

A relapse of typhus.

Relapses of typhus are so excessively rare, that Dr. Murchison, after his vast experience, wrote “I have never met with a case in which, after complete convalescence, a relapse of febrile symptoms has been reached by the return of an unequivocal eruption or could not be traced to some local complication.”

It is rather unfortunate that lean only personally vouch for the alleged second
First attack of typhus.

Theonias, Act 17.
attack in this case, as the first had been terminated 14 days prior to my appointment to the Hospital. There were no notes taken of the first attack; but I collected the following information about it, before those concerned had time to forget the case. The boy was visited on the 3rd day of his illness, just before admission to Hospital, by two medical men who were in the way of seeing typhus cases at the time; they diagnosed it as typhus. While in Hospital he was successively under the care of my two predecessors, who had no doubt of the correctness of the diagnosis. My immediate predecessor informed me that he had a well developed rash. This diagnosis is completely borne out by the temperature chart, which I insert here.

Excepting three curious occurrences to complete my appendix, during the course of the disease, the temperature curve shows nothing peculiar when compared with the typical typhus chart. It ends by a well defined crisis during the night of the 13-14th day of the illness.
Thomas H. was a timid, intractable lad, 14 years of age. He had passed the crisis of typhus 21 days before the gale; but had convalesced very slowly. During the third week of convalescence his pulse, when I examined it, was always unduly frequent, sometimes as much as 120 beats per minute, although his temperature remained normal. This was solely due to the excitement of having his pulse felt by the doctor, because, when the nurses counted it at other times, it was found to be of normal frequency. On the morning of the gale I found him trying to make his bed, though evidently hardly able to stand. While feeling quite well in other respects, he was so weak that he had to be supported to a chair. As he was ordered back to bed in the evening, as in the morning, his temperature was normal. Next morning he complained of headache and sore throat. His temperature was 102°. The throat was pretty acutely congested, the tongue covered with a thick, white fur. The pupils dilated. The front of his chest was cou
...erved completely, with a confluent, prunelike, scarlet rash like the rash of scarlet fever, most characteristically so in the region of the clavicles. In the evening I found that the rash persisted about the clavicles and upper half of the chest. During the next two days it diminished gradually, till there was only a little in the supra- and infra-clavicular regions. On the 4th day of the illness it had again spread all over the front of the chest. In the neighborhood of the clavicles the rash was confluent, but over the middle and lower parts of the thorax the red color was discharged in spots, as if a number of three-penny pieces had been laid on the skin, about 6 cm apart. The intervening spaces had been reddened, while the parts covered by the coins had remained fair. At the same time there appeared on the abdomen black and elevated, red spots, disappearing on pressure. Next day the spots had become larger, red, elevated, more bluish, having, like measles, a...
brownish stains on pressure. They had also invaded the front of the cheek and upper freckles. For 2 or 3 days the spots continued to increase in number, size, and became bluish, till there was a copious petechial efflorescence.

The course of the illness was particularly uneventful. It was an instance in which a well marked petechial eruption did not, as usual, indicate that the case was a severe one. The headache and sore throat disappeared in two or three days, the tongue cleared up, withstanding a temperature of 104°, his tongue remained clean, his appetite good. He seemed always bright. In fact he felt so well after the first 2 or 3 days, that he considered it a hardship to be confined to bed.

The temperature curve was curiously cyclical. The temperature rose gradually for 2 or 3 days, it maintained the highest level for two days, then declined gradually for 2 or 3 days. It passed through two such cycles, each lasting 2 or 3 weeks.
Relapse in typhus.

Thomas H. act. 1st.
by crisis on the 15th day. The temperature rose again 40 in the evening of the 36th hour, finally reaching 104.5. This is not an uncommon termination of typhus. There are other charts showing an almost exactly similar mode of termination. No doubt the typhus poison had been in his system for some days, probably had not been completely eliminated at the end of the first attack and its activity was renewed by the depressing effects of the seer's gas.


Nursing. That nursing is of the first importance in typhus is, I think, clearly proved by the comparison between the two periods of the Blackhead epidemic. The enormous decrease in the mortality percentage, this in part accounted for by the fact that the proportion of cases over 30 years of age was less in the second period, was mainly due to the great improvement in nursing. The first essential in typhus nursing is
the regular or frequent administration of suitable nourishment, without which all else is of no avail. And, indeed, in the case of young people, in a mild epidemic without complications, this is absolutely all the treatment necessary. The nourishment on which I place most reliance is milk, with 1 or 2 eggs in the 24 hours, swissed and added to the milk. Most authorities seem particular about giving as much variety as possible to the diet, as in health. But, as a rule, especially in severe cases, the sense of taste is so dulled that variety is unappreciated or recalled for. As all the substitutes for milk are of less nutritive value, I consider it highly injudicious to vary the diet, unless circumstances imperatively demand it. Especially, I must condemn the favorite practice of giving large quantities of beef tea. It is in no sense a food with stimulating properties, which are its sole recommendation, can be got more conveniently, via small bulk from pharmacopoeal preparations. Even a thinsy patient can dispose of
but a certain quantity of fluid if this capacity be taxed by copious draughts of beef tea, the amount of milk taken will be seriously diminished & the patient will run a considerable risk of dying by starvation. The legitimate use of beef tea is in those cases, where the stomach is overtaxed by the frequent administration of milk & begins to get exhausted. Then the occasional substitution of beef tea for milk gives the stomach a rest & acting as a stomachic, gives relish to the succeeding meal.

Another point of great importance is the frequent turning of the patient. A typhus patient, especially if there is any congestion of the lungs, should pass only a very few out of the 24 hours on the back. He should be turned from one side to the other every 2 or 3 hours, unless nourishment is given, care being taken that he is turned entirely by the nurses & does not exert himself during the process. The lungs, being specially prone to hypostatic congestion in typhus, keeping the patient
on the side turning frequently empties the lungs alternately of the venous blood & gives them a chance of recovering tone or, at least, prevents their getting rapidly more engorged.

Again, the nurse should be very attentive to patients who pass their excreta involuntarily, as so frequently happens during the second week of the fever. Otherwise, if the sheets are not changed frequently, the patient becomes uncomfortable, whereby his rest is lessened, which is exceedingly detrimental to typhus patients.

Sleeping draughts:— Insomnia is a frequent symptom of typhus in adults. I have scarcely seen a case of any severity in adults in which this did not obtain at some period of the illness. On the other hand, children, in my experience, sleep excessively. The effects of insomnia are very evident very pernicious. After a sleepless night a patient looks dull worn out & enquiring usually says that he feels low. It is said that 3 days or even 2 passed
without sleep is almost certain to lead to a fatal result. That must mean absolute sleeplessness; for I had a patient who, in spite of sleeping draughts, did not sleep one hour in the 24 during 14 days, yet she recovered. It is not wise to wait till the patient has passed an absolutely sleepless night before administering a hypnotic. A patient who has only had scratchy sleep, being awake most of the night, will feel unrefreshed in the morning.

There are two drugs that will be found in most cases to give the desired relief. They should be used during different periods of the illness and the use of one or other must be determined mainly by the state of the lungs.

Opium usually prescribed in the form of Dover's powder, 1/2 drachm being a sufficient dose. It is most generally useful in the first week of the fever, when congestion of the lungs has not yet subsided. It may also be used during the second week, when there is no cough.
There is one exception to the contraindication of opium when the patient has a cough. That is in those cases where patients cough most at night, have no congestion of the lungs, bring up no sputum. In those cases, the irritation which produces cough militates against the action of Chloral Hydrate. Here opium demonstrates its superiority by first stilling the cough, then inducing sleep.

Even in cases where there appears to be no pulmonary complication, opium, given alone, may lead to unpleasant results. In the case of a prostitute, who had no cough nor congestion of the lungs and was said to have had no sleep for 3 nights, a dose of Dover's powder led to congestion of the lungs and lividity of the cheeks and lips in 12 hours. She was a stout flabby woman and was no doubt on the borderland of pulmonary congestion, which was determined by the opium. A mixture of ammonium cyanate, with Sr. Digitalis 1/5, every 4 hours, removed the
congestion & fluidity after 3 doses there was no return of it. In such cases the addition of Fr. digit. m10 to the Dacon's powder will avert this result.

Moreover, I believe that the digitalis not only prevents the congestive effects of opium, but is of itself an aid to obtaining sleep. In typhus the pulse being very compressible & the heart weak, there is an anemic condition of the brain which is probably one of the causes of sleeplessness. This view is borne out by the fact, that a patient suffering from insomnia, the only ascertainable cause of which is a weak heart, will often be readily relieved of the distressing symptoms by the exhibition of digitalis.

Clenalin hydrate should be given where opium is contraindicated by the conditions already pointed out. Closely to its depressing effects, it should not be given without a few (10 m of Fr. digitalis.

The dose is gr 20. Where delirium is a prominent symptom a second dose will often he required seven that may
fail &tsc; theret is necessaty to give opium. Europe opium requires to be rapidly pushed in these cases to have the desired effect.

The effect of a sleeping draught is usual-ly as evident as that of a sleepless night. The patient usually looks brighter & feels better & there is not in frequently a fall of the temperature to the extent of 1° to 2° below the usual morning temper-ature, especially where the draught has been administered towards the end of the fever. Once in a while on occasion it has occurred to me, that a sleeping draught given on the evening of the 12th day of the disease, has been followed by a good night's rest & the arrival of the crisis on the 13th day. Whether a hypodermic administered shortly before the crisis is expected, has an effect in determining its earlier occurrence, or whether this observation is the preceding ones are merely instances of coincidence, I am not prepared to state.

Alcohol: I do not hold extreme views on the use of alcohol in disease, but I am certainly not much in favor of its
use in typhus, especially as a routine practice. As far as my observation goes, when there is pulmonary congestion present, alcohol seems to increase it. There is only one circumstance under which I care to prescribe it. When a patient, under stimulation by phenacetin preparations, is still sinking & becoming very prostrate, an occasional dose of brandy will help him over a difficult place; for instance, a dose at 3 a.m. would tide him over the most dangerous period of the day.

Digitalis: - I consider digitalis to be a drug of the utmost value in severe cases of typhus. I would place it along with the hypnotics as one of the indispensable agents in the treatment of the disease. While being given in heroic doses in Germany, it seems to have been comparatively neglected in this country. The only mention I find of it in such an authority as Pagge is a recommendation that it should sometimes be prescribed along with chloral hydrate, to obviate the depressing effects of the
latter. The indications for the exhibition of digitalis are exactly those usually given for the use of alcohol. When the patient is getting very low & sunken in bed, when the first sound of the heart gets shallow & the pulse is very feeble & frequent, these digitalis is indicated. Perhaps it might be advisable to begin the administration of it before matters come to such a pass. One might thereby be enabled to prevent the patient from becoming very prostrate. Usually within twelve hours of the first administration of the drug an objective & subjective improvement takes place. The patient looks & feels better, the temperature slightly falls & the pulse becomes less frequent & firmer. That occurs in severe cases with insignificant affection of the lungs. But it is mainly in cases with grave pulmonary complication that it shows itself of most value. As a slight instance of that I may cite the case of the prostitute before mentioned. The effect was even more marked in the case of the
nurse who died. She was a stout woman, who
for years had been subject to attacks of
bronchitis every winter, with intermittent
symptoms. The back of both lungs was
congested & there was consolidation at
one base. When I saw her on Nov. 2nd she
was very feebly, with a soft pulse of 140
& considerable lividity of the face. In dig.
mg was added to her cough mixture every
4 hours & as usual, after a few doses
the lividity had almost left her face
& she continued in an improved condition
for 2 days. She passed the night of
without sleep & on the evening of the
5th she was again very livid, breathing
with great difficulty & with the death
rattle in her throat. I was convinced
she would die in the early hours of
the morning; but, to give her one more
chance, I prescribed Chloral hydrate 20
+ tr. dig. m 10. She slept well next morn-
ing the lividity was slight & she was
breathing with tolerable comfort &
without any rattle. She sank & died in
the afternoon; but I feel sure that her
life was prolonged 12 hours by the conc-
bined effects of the hypnotic & digitalis.
The following case shows how digitalis
saved a woman from one kind of death
almost to kill her in another fashion.
Sarah J., aged 52, was one of the female
patients affected by the sewer gas. Up to
the time of the gale the case had not
been severe, but on the following day
she was much worse. Two evenings later
she was very weak, sunk in the bed,
with feeble pulse, muttering delirium,
unconsciousness even when an attempt
was made to raise her, an occasional
cough, well-marked Cheyne-Stokes respira-
tion. Dr. digit. m 5 were added to her cough
mixture, to be administered every 4 hours.
Next morning she was sensible & felt
better. Her respirations were 32 per min-
ute, but quite regular. In the evening
she still felt pretty well & there was no
return of the delirium. Her respirations
were 40 & irregular in the following
manner. For the most part breathing
was natural, there, for 1 or 2 minutes, she
would breathe loud enough to be heard
distinctly at some distance, but regularly,
breathing, as if were on two keys. Rarely
occasionally she intermitted or 2 respirations.
Next morning the crises occurred the
digitalis was stopped. On the following
morning the pupils were dilated, she
had a vacant stare complaining of se-
vere occipital headaches. The pulse being
heard & the urine showing a trace of
albumen, I feared that cerebral hae-
orrhage was impending. The exhibition
of calomel gr. x in 2 grain doses, every two
hours, moved the bowels copiously &
reduced the pulse tension. After a day
almost complete starvation, the pain
had disappeared as she felt well. Food
had to be given cautiously for two weeks & the bowels had to be well
attended to, the headache returning
if they were confined for two days.
This was evidently a case of chronic
Bright's disease, in which digitalis,
by raising the pulse tension, had al-
most produced rupture of a cerebral
artery.
The two following cases, with which I shall conclude my thesis, are of great interest, as bearing on the question of the coexistence of two specific fevers in the same patient. Hunter held that the doctrine, that one specific fever, as it were, shut the door against all the others for the time being, so that it was impossible for one person to be the subject of two specific fevers simultaneously. At late years evidence has accumulated showing that two of the specific fevers may coexist in the same person. And not isolated cases, but epidemics occur, in which, for instance, scarlatina and measles are commonly so associated.

In the cases which I have read, of coexistence of typhus and typhoid, there has simply been an overlapping of the two diseases during a few days. In the two cases which I am about to describe, the two fevers, if they were both present, must have commenced about the same day. For in each case, as I take it, the typhus
terminated on the 13th day of the illness, while the typhoid element continued to the 21st or 22nd day. It may be objected that such an extraordinary coincidence, especially as it is alleged to have occurred in two cases in a short experience, is not to be entertained. I would suggest in answer to that objection that, supposing the poisons of both diseases were present in a person, the supervention of the febrile symptoms due to one of the fevers would bring the organism into a condition favorable to the immediate activity of the other poison; although, but for that occurrence, the poison of the second fever might not have manifested its presence till some days later.

In these two cases I was, fortunately, not able to confirm my diagnosis by post mortem examination. But, if it is considered that I have not proved my case from the course of symptoms, it must at least be admitted that they were very unusual cases of typhus.
Supposed existence of typhoid fever.

Annie L., aged 29, nursing maid at a nursing institution for the last 14 weeks, acting as nurse in the Fever Hospital, was attacked with typhus on Nov. 14th. Her experience in the hospital had rendered her ill-fitted to bear up against so prostrating a disease. She entered the hospital at the time the two nurses were laid up with fever and as she found there was no assistance but that of a charwoman to nurse 22 patients, she remained on duty for 42 hours till another nurse was procured. Her only rest during that period was obtained by swathing two hours sleep, with her head on a patient's pillow. She had besides difficulty in getting sufficient food. For a week, up to Nov. 24th, she slept in a bedroom which was, as before described, fumigated twice a day with sewer gas. On Nov. 6th she insisted on carrying one end of the stretcher on which her deceased friend, nurse J.C., a heavy woman, was borne to the mortuary. Whether she
overtaxed her strength or was overcome by her feelings or whether both causes were operative is uncertain, but when she reached the mortuary she was seized with a fit of faintness, with chilliness & shivering which lasted for several hours. Next day, Nov 7th, she was, as already stated, subjected to the action of surergest was laid up with headache, sore throat & diarrhoea. Add to this series of misfortunes, that she was a stout woman of relaxed fibres, that she had a weak heart after two attacks of acute rheumatism & that she was subject to frequent attacks of acute bronchitis & one could hardly picture a person more unfit to successfully withstand the assaults of typhus.

I conclude that the depression of her vitality, occasioned by the events of the 6th & 7th Nov., determined the acquisition of the typhus poison, which would give the average incubation period of about 10 days for typhus. The date of infection was
typhoid might have been any period of the week preceding 1st Nov., when the sick in all atmosphere united with severerias. This would give a minimum incubation period of 14 days. Or it might have occurred on the 7th Nov. from the severerias, which produced some throat, giving an incubation period of 20 days.

On the first appearance of the rash, it consisted of a few scattered, elevated rose-coloured spots disappearing on pressure, some of these lenticular, & apparently quite characteristic of typhoid. During the next 1 or 2 days it still presented this character in part, though getting masked by the predominance of the typhus rash, amongst which the lenticular spots could not be found later.

During the first 9 days she presented the usual appearance of a patient suffering from typhus, except that the pupils were dilated & there was a good deal of abdominal pain. This was due mainly, if not entirely, to flatulence, the
abdomen being much distended; for there was no tenderness in the right iliac fossa. I had a suspicion that there was a typhoid element in the case. I imagined that the reflex phenomena, that serve to distinguish typhoid fever from tubercular meningitis, might distinguish typhoid from typhus. I found in this case exaggerated palmar reflexes and marked ankle clonus; but on investigating the matter, found this to be a quite common symptom in typhus. On the 9th day, finding her becoming very feeble & the pulse frequent (32), I exhibited digitalis. After taking m50 of the tincture in 26 hours, it was reported to me, that during the last 12 hours she had passed 7 liquid motions, each of over a pint in amount. They were grass green, witte with flocculi. A nurse experienced in nursing typhoid cases stated that they smell like typhoid stools. As the bowels up to this period had been rather constipated, it was considered that the diarrhoea might have been occasioned by the
digitalis, the administration of which was accordingly stopped and bland and astringents resorted to. Notwithstanding this state of things, the patient felt stranger and better during the administration of the digitalis. The diarrhoea continued for several days unabated. The pulse became progressively more frequent, the patient much in bed and more feeble. In the afternoon of the 11th day she had a fainting fit, in fact was for a time supposed to be dead. There was a recurrence of the syncope during the succeeding night. In the morning of the 12th day the pulse was 148 and very feeble. The patient was in bed exceedingly reduced. The only favorable symptoms were, that the tongue was moist, nourishment was taken in sufficient quantity. The mind was clear. As the diarrhoea seemed to be draining her strength, a further endeavour was made to check it by adding rice water to the milk, exhibiting 0.58 opii and changing the diet.
She refused however to take any nourishment but milk & eggs.
In the evening the pulse was 168, the respiration 56 (without pulmonary complication) & the temperature only 101.4°. She had scarcely slept for 48 hours in spite of opiate, & chloral hydrate made her excited. In her state of profound prostration she believed an opiate would probably change sleep insensibly into death & gave her no draught. I did not expect her to survive till morning, indeed, by chance, the crisis should occur 24 hours in advance of the usual time, which indeed happened. During the night she slept about 10 minutes. She could swallow only with great difficulty & through conscious, was too weak to speak till early morning.

Next morning, the 13th day, the temperature had fallen only 1/4°, the pulse was 148 & the respiration 32. The patient had evidently passed through a crisis, however incomplete.
Support concurrent of typhus & typhoid

Typhus crises on 13th day

Annie C. age 29.
She was still sunk in the bed, had a dirty grey discolouration about the mouth & clinch twitching of the oral muscles. Nevertheless, there was a great change. Her eyes looked brighter, the pulse was much stronger, she answered questions in a distinct tone. She took some interest in her surroundings. Lastly, she felt better stronger.

In the evening the temperature rose up to 2°, to 103°, pulse 160 & respirations 42.

Yet she continued to improve in strength, the improvement continuing for 24 hours longer.

On the 14th day the flesh colour round the mouth & the twitching had disappeared. The temperature began to fall & in a rather irregular fashion, continued to fall till on the 22nd day it became subnormal. Thereafter it continued to lie about 10° above normal during the first 3 weeks of convalescence. The pulse being for 1 week over 120 & over 150 for the two succeeding weeks. Both symptoms were probably the result of extreme
weakness, as there was no organic disease to account for them.

On the 14th day, for the first time, the tongue, previously moist though covered, became dry and brown, and remained so for two days. After the 16th day it was moist and rather bemused, beginning to clean on the 22nd day.

In this case there was a close rank of large petechial covering the trunk and upper limbs. The spots had increased in size and depth of hue till the 12th day. On the 13th day they began to fade, by the 15th day the phlegm was generally fair, with a few of the most petechial spots still showing.

After the 14th day the motion, though still uncomfortable, were reduced in quantity, but from being always quite fluid, because occasionally semi-solid. The diarrhoea ceased about the 19th or 20th day.

The reasons that lead me to conclude that this patient suffered from typhoid as well as yaws fever are:
1. The fact that she was exposed on two occasions to the contagion of typhoid.
2. The typhoid-like character of the rash on its first appearance.
3. The dilatation of the pupils throughout the illness, the pupils being usually contracted in typhus, especially in severe cases.
4. The character of the stools & the occurrence of profuse unrestrained diarrhoea, which ceased only when the temperature approached normal.
5. The occurrence of abdominal distension & pain.
6. The occurrence on the 13th day of a crisis in symptoms, though with no marked subsidence of fever, indicating the termination of the typhus fever.
7. The disappearance from the 13th day of the typhus rash, also indicating the termination of typhus.
8. The gradual subsidence of the temperature by lysis, extending over a period of 7 days.
9. The exceedingly slow convalescence, unusual in typhus.
I have in a curious point to be noted with regard to the temperature. It fell gradually 3° during 48 hours, from the evening of the 10th to the evening of the 12th day, immediately preceding the crisis. During this period the patient was steadily getting worse & the frequency of the pulse increasing. Accordingly, it cannot be looked upon in the light of a prolonged crisis, but rather as one of those cases of typhus, without much delirium, in which a gradual lowering of temperature occurs during the 2 or 3 days preceding death. I look upon it as an ominous sign.

As regards pulse rate:— At the evening of the 12th day the pulse was so feeble & the beats ran so much into one another, that for the most part it was impossible to count it. On two occasions, however, during my visit, it became countable for the space of about half a minute & then the frequency was 165. At the three succeeding evenings it
registered respectively 160, 150 & 152, the
morning pulse during that time
being 148. Moreliano says that a
case is severe if the pulse rate con-
tinues as high as 120 & that a rate
of 150 maintained for 3 days is fatal.
Here however the pulse for four
evenings registered considerably over
150, the morning pulse being almost
150, yet, instead of a fatal issue, the
patient actually began to improve
during that period. I think this
is a further argument in favour of
the view that it was not simply a
case of typhus.
The following case, which was ad-
mittted weeks after that just de-
scribed, bears in several points a
strang resemblance to it.
Supposed existence of typhus typhoid.

Margaret R., aged 19, was admitted into the Fever Hospital on Dec. 8th, 1890, on the third day of her illness. She came from a low congested part of the borough. Her sister, who lived in the same house, had just recovered from an attack of fever. Her medical attendant, who had considerable experience of typhus, could not determine whether she had typhus or typhoid; but notified the case as typhoid as it resembled that disease rather than the other. Margaret R. certainly had typhus, as two sisters subsequently contracted the disease.

At admission her temperature was 102°. She complained of severe frontal headache, pain in the abdomen, which seemed to be due to flatulence, constipation. She had also a frequent hacking cough without expectoration. She said she had not slept for 2 nights. A Dover's powder gave her a good night's rest, settled the cough, which disappeared in the course of two or three days.
The pupils were dilated & the tongue 
furrowed & moist. Sleen was slight 
red mottling over the chest. The 
temperature rose gradually till on the 
evening of the 6th day it was 104.8°. For 
6 days it remained between 104° - 105°. 
Thereafter a modified crisis & subse-
guent elevation, it descended to normal 
in the space of 3 days. 
On the 5th day a papular rose rash ap-
peared on the trunk. Some of the spots 
disappeared on pressure, others list 
a brownish stanic like necules. The 
rash gradually increased in severity, 
by the 8th day was very copious on the 
trunk & limbs, both upper & lower.
The efflorescence was so thick on the 
distal half of each foreamce, that the 
spots were for the most part confluent.
The spots became more & more petechial 
till the 13th day. The knee jerks were ex-
aggrated & there was ankle ecyclus. 
The pupils remained widely dilated 
all through the illness.
The tongue, at first moist, coated & 
smooth, became dry in the centre on
the 5th day 2 or 3 days later because typically typhoid, dry, brown, deeply fissured.

Her husband said she was a great sleeper, i.e. fast came off a sleep, faintly but, although her eyelids were kept closed day and night & she appeared to sleep well, she complained of want of sleep. It was difficult under the circumstances to arrive at a just conclusion on the matter, but after an opiate she always admitted that she had slept well.

She was fed on 3 eggs beat up in 3 parts of milk in the 24 hours. From the first time was great difficulty in getting her to take nourishment, but as the nurses insisted, she did take it grumblingly, apparently to get rid of the annoyance. She was frequently sick without nausea. The vomited matter appeared to be the yolk of egg, the rest of the food being retained. By leaving the yolk out of her food for 2 or 3 days & giving 2 or 3 doses of tea biscuit before meals, this serious
symptom was relieved almost at once. Her bowels remained constive during the whole course of the disease.

The pulse after admission became rapidly more soft & compressible, at the same time increasing in frequency. A mixture containing &r. dig. m.5, thun. v. m.5, &c. nit. lud. dil. m.15 & et. Gent. col. administered every 4 hours, diminished the rate of failure; but still she soon became very helpless when being turned in bed.

On the 8th day the urine became watery, high colored, smoky from admixture with blood & albuminous. Sphacelitis was administered every 4 hours & slacks fomentations kept constantly applied over the kidneys. Next day the urine was more copious, paler, less smoky & in two or three days had again become normal.

The pulse gradually increased in frequency till it was 136 on the 11th day.

By the 10th day the patient was in an anxious condition. She slept little, even after the exhibition of opiate, complained of severe headache & had
Supposed commencement of typhoid & typhoid

typhoid crisis on 13th day

Margaret A. aged 19
a frequent, very feeble pulse. The dose of digitalis was increased to mgs. of the tincture, every 14 hours.

On the morning of the 12th day the temperature was 104.6°, the same as on the preceding evening. The patient felt very low and was stuck in the bed. The face was flushed, the respiration steamed up visibly from the forehead. The pulse was 125 in frequency and very feeble. The tongue was dry and brown protruded with great difficulty. The headache was very severe.

By the evening the temperature had fallen to 104.0°. The patient remained in the same reduced condition.

During the following night she slept but little. The temperature had fallen to 103.0°, a fall of 1.6° in 24 hours. The change in the patient's condition was remarkable. For the first time since her admission she kept her eyes open, looked about her intelligently, took an interest in what was going on in the ward. The headache was quite gone. She said she felt much better, was hungry
asked for bread & butter; whereas, previously, it was with difficulty that she could be prevailed on to take food. She rash, which had made her body appear of a dusky red colour, faded rapidly, that, by next day, the skin appeared fair with scattered, faint, fading petechial. The pulse rate had fallen from 125 in the evening, 105 in the morning, the least frequent state since the 5th day. The pupils remained dilated. The tongue was moist at the tip, edges were protruded without difficulty. In the evening the temperature was 2° higher & by the evening of the 13th day the thermometer registered a temperature of 104.6, the pulse being correspondingly more frequent. Still the improved condition was maintained. From that time the temperature gradually fell, becoming normal on the 24th day. The discharge was interrupted on the 18th day after a night of active delirium, during which she constantly tried to get out of bed. It was
interrupted again on the 20th day. By a reference to the chart it will be seen that, notwithstanding these interruptions, in the absence of the temperature, the general condition continued steadily to improve, the pulse on each occasion being considerably less frequent than on the preceding day.

During the first week of convalescence the ramblings occasionally, but during the ramblings was able to answer questions intelligibly. The eye and the tongue became completely moist under the temperature, after an evening rise, finally became normal.

As already remarked there is a great similarity between these two cases. There are two or three facts common to both, that seem to preclude the idea that they were merely cases of typhus. In each, on the 13th day, there was a crisis as regards symptoms, with a slight fall in the temperature, a considerable abatement in the frequency of the pulse. Again, in each, in the absence of any
of the ordinary complications of typhus, there was a subsequent elevation of the temperature followed by a gradual decline during 7 or 8 days. But notwithstanding this remission, if fever it was abundantly evident that each patient had been relieved of the greater part of her illness by the crisis on the 12th day.

Lastly the rash was dusky petechial in botte instances. In such cases it may persist a day or two after the crisis but will not disappear prior to it. Yet in botte cases it faded so rapidly that within 24 hours after the alleged crisis on the 13th day the skin was generally of a natural fairness with only a few of the more deeply petechial spots remaining.