On
The Origin of
Syphoid Fever.
By
Alfred Besnard, Mauritius
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On the Origin of Typhoid Fever.

Of all diseases Typhoid Fever may be said to be the one, which has created more sensation and given rise to more discussion in the Medical World from the earliest period of its Discovery. It is in fact one of the most common and fatal affections we come in contact with in Hospitals, in large towns, in the country, abroad as well as at home, although this disease was at one time supposed to be limited to the Continent.

Unlike other affections and like Death itself, it does not spread its ravages among one class of men in particular:

"Le Roi, en sa cabane où le chameau le couvre
Est sujet à ses lois;
Et la Garde qui veille aux barrières du Louvre
N'en défend pas nos Rois."

"Malherbe. On Death."
We are not without knowing that the study of Typhoid Fever has proved a stumbling-block to many an eminent man in the profession. The Microscope, Chemistry, Pathological Anatomy have all been resorted to; but beyond the lesions found after death, no decisive result has been obtained.

Although many a learned observer has seen his hopes baffled in the solution of the question, and however difficult and fraught with danger may be the task we are about to undertake, we shall not shrink from our duty, for in the words of Mons. Delpeau: "Les sciences, formant une république, où chacun doit être libre de chercher, d'examiner, d'avoir ses opinions, et de dire ce qu'il pense."

Before discussing this subject, we think it proper to give a short historical resume of the different names which have been applied to this malady, and to lay down the real meaning which we give to the word Typhoid Fever.

This Fever known to the ancients under the names of "Fæbris Mesenterica Maligna" and "Fæbris Victiida" was described in the year 1760 by Roderer and Wagler under that
of "Mucusus Fever" or "Morbus Mucosus."

Although Mons. Proet in the year 1804 had already pointed out the intestinal ulcerations which are seen in Typhoid Fever, Measles, teres & Petit in 1813 thought they had discovered a new malady and called it "Entero. Mesentericæ" so much was known of this disease, when in 1822-27 Mons: Louis began his researches on that affection and proved without the least shadow of a doubt, that the lesions of Tügel's patches being always a characteristic sign of all the essential fevers of Mons: Pell, was connected with a certain malady which always presented the very same pathognomonic characters, he first called it "Fiebræ" or "Affection Typhoïde," in spite of Bossiers who saw in that affection nothing but an acute "gastro-enteritis," it is described in the present day under different names thus:

Chromel, Andréal, Grisolæ, le, holding the same views as Louis, calls it by the same name "Fiebræ" or "Affection Typhoïde," Bretowneau, Dohiænteritis, Rostan, Typhoïdes or Typhoid Fever, Bouilland, Typhoïdie Entero. Mesentericitis, Cruveilhier, Forget,
Follicular enteritis, Ritchie, Eocectic V. Enteric Fever; Dr. Murchison in his Treatise on Fevers, objects to these names especially to the last as it is apt to convey the erroneous impression that the fever is the result of the intestinal lesions and may tend to revive the exploded doctrines of Bloussard, and has therefore given it the name of "Pyrogenic fever" according to its mode of origin.

We shall in this essay retain the name of Typhoid Fever as it is the one which is generally accepted: but without by any means pretending to give a definition of this malady, we make bold to affirm, that we look upon it as affecting the system generally and characterized principally by febrile symptoms, by different local, but especially by intestinal lesions of a special nature, and lastly by those particular effects on the nervous system to which the name of Typhoid has been given.

The causation of diseases in general the most difficult part of their history, and it is often very difficult (not to say impossible) to appreciate the value of the causes which may produce morbid affections, in fact if we...
we were to refer to some treatises on Typhoid Fever, we meet with an obscure indication of general causes, for the most part common to all maladies, if some authors thought they could lay more stress on certain observations, we soon find out that they have paid more attention to isolated facts which do not permit of being generalized.

(Please note: Louis, Chomel, Andral and others have tried to discover the origin of Typhoid Fever. The age, sex, constitutions and avocations, the consequence of change of habits and acclimation; physical and moral fatigue, privations, insufficiency or inferior quality of diet, self-indulgence, unwholesome and overcrowded dwellings have all been investigated by them, but without throwing more light on the subject under consideration, for were we to cast a glance over the causes above mentioned we find: that every population may be affected. That women are affected in nearly the same proportion as men. That if it attacks the adult in preference, neither infancy nor old age are entirely free from it.

According to Meyers, Barrier, Tanfin, Petit, Andral, and others, we find:}
That it is more prevalent in towns than in the country.
That no constitution has immunity from it.
That non-acclimatization predisposes it.
That overcrowding, defective ventilation favors its development, as has been demonstrated by
Professor Perry.
From what has been said above, it may easily be seen that very little has been discovered
as to the origin of typhoid fever, and we are
not at all astonished, if some authors profess
that the cause of this disease is unknown, that
it entirely escapes our observations and that it
is in fact a mystery to science.
However hidden may be the origin of
this disease we are of opinion that the only
way by which some light may be thrown on
this subject, is by bringing a number of cases
together collected from different parts of the
World, by men whose high position in the
Medical World, leaves no doubt as to the
accuracy of their observations.
We shall begin by exposing the result of
our examinations by stating that typhoid fever
is, or must be originated by putrid or decomposing
Animal and Vegetable matters; we believe that
those substances reach the circulation either by the digestive or by the pulmonary organs; they then become mixed with the blood and after a variable period of incubation, they give rise to those disorders which we observe and the end of which is to eliminate from the body those substances which are dangerous and hurtful to it. That the system is intoxicated by a poison we shall prove without the least shadow of doubt, as we proceed; but before going any further we must lay down, that overcrowding is one of the most common accidental causes, especially in large towns where the atmosphere holds in suspension all sorts of foreign bodies, where the inhabitants are innumerable and where the rooms are small and not so well ventilated as in the country.

Overcrowding, the natural consequence of which is to contaminate the circumvent atmosphere is known to originate Typhus Fever; it is well known that Typhus Fever takes its origin from the prolonged accumulation of either healthy or unhealthy but most especially from the latter.

In the case of Typhus Fever the intoxication
takes place between man & man and in identical circumstances, as it was observed in the Crimea. In Typhoid Fever every time that we are able to ascertain the origin of a case, we observe that the intoxication can take place "all other toxic causes being excepted" not only between man & man but also on only one individual living in a close & narrow room.

Furthermore it is found that the patients we find that the patients had slept in a room either overcrowded or small in which there was hardly any ventilation, and the atmosphere of which was rendered almost irrespirable especially towards morning.

Besides overcrowding we have observed either coincidently or separately, the presence of putrid animal matters to the influence of which we have been able to attribute certain cases of Typhoid Fever; we have traced the cause of this affection in the prolonged influence of miasmata arising either from sewers, water closets, or from egesta allowed to stand too long in the bed chambers.

The following is an illustration as to the influence of overcrowding in the development of Typhoid Fever.
Mr. Boudin says "During the period of 1843-44 inclusively, I observed every year in the military hospital at Versailles a dreadful epidemic of Typhoid Fever, raging towards the month of October, exclusively from amongst the patients coming from the garrison of St. Cloud; there was this remarkable about this epidemic that it used to show itself every year eight days after the arrival of the King and that it subsided soon after his departure from St. Cloud, without ever affecting either the town population or the officers, although those last named lived in the same barracks as the soldiers.

Generally the garrison of St. Cloud amounted to between 400 or 500 men, and the number of the sick was small, but as soon as the King arrived, the garrison was increased to about 1200; the soldiers were then cooped up together in narrow & badly ventilated rooms whereas the officers had not only less to do but were better lodged (always at least a room for two) Ann. D'Hyg. et Med. Lég. Vol. XXXIX. p. 379. Mons. Piorry has shown, in a memoir before the French Academy of Medicine that, in ninety cases of Typhoid Fever collected in 1835-36 by a good many practitioners that: small over-
crowded rooms & the inhalation of impure air gave rise to the development of this dreadful affection.

Besides these causes above specified we believe that the Typhoid poison may be carried, especially in the present day when travelling is done with such facility that a person affected with the disease may go to the two or even three hundred miles from the place where he was attacked, and through him an epidemic breaks out in the locality and this one of the reasons why it is sometimes impossible to trace the disease to its primary cause. This is no hypothesis, for we have had occasion to see similar cases not only through the diseased individuals but also through the clothes of those deceased being sent to their homes and thereby infecting those coming in contact with them. We do not ignore that contagion is not admitted by many medical authors of high standing but we have had sufficient proofs from the cases which we ourselves have seen & of those we have read from different authors.
Redwache, to state that we believe this disease is contagious. Whilst admitting the contagiousness of this disease we do not believe it to be necessarily so in every case nor even so contagious as Typhus, but as it may be transmitted we think proper to look upon this as one of the accidental causes of the Origin of Typhoid Fever. We shall content ourselves with quoting from a prize Essay of Mons. Redwache of Derian, who whilst admitting the contagious nature of the disease very properly remarks that. "Ce phénomène (contagieux) n'a pas toujours lieu."

We shall not insist any longer on the contagiousness of this disease but return to the subject of the influence of decomposing matter in the development of this Dreadful affection. Mons. Bouchut speaking of this influence of putrid emanations says: "Dans le monde soumis à leur influence, ne les subit pas nécessairement. Elles ont pour réaction morbide: l'entérite simple, la colite ou Dysenterie, la Fièvre Typhoïde, et quelquefois la mort immédiate. En 1745 au moment d'une inhumation dans l'église de Saint-Saturnin, le cercueil souffit en même
It was to the presence of oniæmas arising from the earthen works (travaux de terrassements) round the college of Amiens, that Professor Rostan attributed the origin of the dreadful Typhoid epidemic of 1840.

A similar epidemic at Lyons in 1847 was traced to the putrid emanations from the open sewers during the repairs. From what we have said above, it is evident to us that Putrid animal matters, overcrowding, and Deficient Ventilation, all circumstances tending to vitiate the atmosphere by generating midalmata, predispose the system for the invasion if they are not the exciting causes of Typhoid Fever. But what the poison is or how it
At acts on the system, we are not prepared to say for it would be mere speculation on our part and medicine has not yet reached that degree of perfection which enables us to know Causes through Effects.

We beg leave to quote a few cases in support of our opinion as regards the Origin of Typhoid Fever. We shall glean our facts from the observations of our predecessors and we have no doubt that it will be obvious to everyone that, that dreadful malady may take its origin from the causes above specified.

Case I.

On the invitation of the prefect of the Lower Province of the Rhine, Mons. Rieuf and Mons. Blum, both conveyed to Bischoffshausen on the 2nd October 1832 in order to take charge of the patients labouring under an epidemic "Typhoid Fever" which raged during the months of August, September and October of the same year. The next day (3rd Oct) they found 93 patients on the following days 22 & the Deaths among the patients already amounted to 24.

The place where the disease raged was situated on the declivity and at the foot of a very fertile hillock and appeared to all appearance very
sallubrious. The streets in general are clean, well aired and the houses well kept. The inhabitants 1680 in number, live frugally and comfortably, but there was one thing which was not foreign to the development of the epidemic: it is the situation of the Cemetery in the centre of the village (the most populous part of it) which is surrounded by houses on all sides. In those houses there were the greatest number of sick and deaths. I must remark also, as a cause, the disposition of the pipes which convey water to the two fountains of the place (situated one in the centre, the other at the lower part of the village). Those pipes are made of wood and lie at a small depth under cesspools and dung-hills.

Gazette Med: 1834, page 38.

Case II.

In autumn of 1867 an epidemic of Enteric Fever occurred at Windsor, which was made the object of special enquiry by the Medical Officers of the Privy Council, and an account of which, founded on my own investigations was communicated to the Epidemiological Society. It was calculated that, during the last four months of the year 1440 persons, or about 120 of the entire population, were attacked of whom 39
The characters of the fever were well marked. The fever was due to the emanations from the sewers was the undisputed opinion of all who investigated the circumstances. Most of the cases and all but one of the fatal cases, were confined to two of the three districts of the town, the low-level and high-level districts. Both of these districts had a complete system of drainage, with water closets within the houses, and sinks in the basements and kitchens. The drains in these two districts were flushed partly by a continuous flow of water through them from the Thames and partly from artificial tanks. But in consequence of a long continued drought, the Thames had fallen greatly in its level, while the tanks had from neglect been allowed to get dry. The result was, that the sewage accumulated in the sewers, in consequence of their ventilation being very imperfect the sewer gases escaped directly into the houses. In the two districts mentioned the fever attacked the rich and poor indiscriminately, but the causes were more numerous in that part of the low-level district, where they had the least inclination all the drains of the town converged, and where they had the
least inclination. The inhabitants in these districts complained of the offensive smells from the drains in their houses, and particularly in the houses where the fever occurred. The district of the town which remained almost exempt from the fever was the worst & poorest where cholera had raged with greatest severity in 1849. Although the drains of this district also suffered from want of water, the water-closets were almost invariably outside the houses, & there was no direct communication by sinks, or otherwise, between the drains and the interior of the houses. With few exceptions bad smells were not complained of in this district.


Case III.

An epidemic of Typhoid Fever broke out at Mayence in a barracks, which had been built ten years previously, and was situated near the Rhine. In October 1843 there were 6 patients, in November 9, in December 23, in January 1844, 86, and in February 5; total 129. The soldiers in that barracks were in hygienic conditions identically similar to those of the rest of the garrison; there was not a single case of fever either among the other soldiers or the population.
It was therefore difficult to explain the cause of the disease in which the abdominal symptoms were prevalent, until the bad quality of the water in the well had been found out; the water deposited a brownish sediment on standing and was in total putrefaction in twenty-four hours; this was owing to the well communicating with the cesspools, the pipes of which were blocked up. Sick soldiers who were taken to the hospital communicated the disease to soldiers coming from other quarters.


Case IV.

An epidemic of Typhoid fever at Church Park and Oswaldtwistle, two villages near Blackburn (Lancashire) and according to the enquiries made by competent authorities it seems to have declared itself in October last between which time and the present (November) there has been under the treatment of the two resident Medical men upwards of three hundred cases of Typhoid fever. At the present time there are more than one hundred under treatment and this in a population of little more than 12,000 people. The fever has been of the ordinary Typhoid, in some cases with enteric symptoms.
scarcely existing, but in by far the majority presenting the characteristic diarrhea early in the disease."

Let us now see what was the cause of this dreadful epidemic.

"The conditions under which the inhabitants are placed are exactly such as one would have expected to find coexisting with an epidemic of this severity. The wonder being, not there is fever but rather that they are ever free from this or similar diseases, arising from the most scandalous neglect of the simplest sanitary precautions. As an illustration of the effects produced by want of drainage we may mention a single case.

In one house, forming part of a row, which has suffered perhaps more severely, and which certainly suffered earlier than the other parts of the townships, five cases of fever occurred: the father died; the other members of the family are yet ill, and probably some will die. Under this house is a cellar in which no one had lived for twelve months; and upon examining this cellar after the outbreak of the fever, it was found that it had been converted into a natural receptacle for all the drainage
of the adjoining houses. For more than a foot deep
the floor was covered with a semifluid mass of the
most disgusting filth imaginable; the stench from
which was, as may be conceived, enough to overpower
the most seasoned. This is only a single, but
striking example of the filthiness which abounds,
and its natural consequences; and yet there
are people resident in the neighbourhood who
can rade wonder why fever has here a constant
chronic existence, and why death rate should
be twenty-seven or twenty-eight per thousand.
The privy accommodation is miserably defective.
In one instance, close to the spot where the
severest cases have occurred, the privy is open
to the thoroughfare, and the drainage from
which makes its way into open gutters, poisoning
the air in every direction. Rigs, as might be
expected abound, in many cases close to the
houses, adding materially to the other general
causes of unhealthiness. The paving of the street
is as bad as possible. In short, the characteris-
tics of the whole place are extreme filth and
extreme carelessness, proclaming with no
uncertain sound the scandalous ignorance, or,
what is worse, the more scandalous neglect of
Case V.

On the 26th of December, following Christmas a great number of families were more or less seriously laid up. The character of Typhoid fever began to show themselves in the midst of these indispositions; but it preyed especially on two schools, one of girls and the other of boys, which were situated at a short distance from the cemetery. Out of 90 children scarcely 10 were spared. The fever showed itself at a later period and smote a lesser number of children in a third school, situated at the highest end of the village, further from the church yard and on a fine site. Numerous cases of fevers suddenly appeared in the village and went on increasing, especially in the neighbourhood of the Cemetery. This cemetery which is situated in the centre of the village is remarkable for its extreme antiquity. The inhumations in it are by far too close to each other; the ground is seldom left three years without being starred. The soil does not always allow graves to be dug to a convenient depth; the earth thrown over the coffin is generally only 18 inches deep. The remains which are disengaged during the putrefaction
of the bodies buried in those graves float and are stirred in its turn which was the case at the time of the epidemic of 1835. Those miasmas may enter the church and affect those who frequent it, especially on days of grand ceremonies as that of Christmas when Masses succeed each other and are protracted from midnight until the next day at midnight, a great number of people affirmed that they felt while at church on the Christmas day which preceded the invasion of the disease, a bad and peculiar smell which excited in them nausea, vertigo and malaise. Dr. Faurré adds that he has already had occasion to observe the obnoxious influence of that cemetery during another epidemic of Typhoid fever which took place at Vieille-Vigne in the year 1830. That epidemic was remarkably like the one of 1835 and all the people in the neighborhood who were first laid up with the fever had carried it from the village. Of 500 inhabitants who were attacked 147 perished—(Journal de la Société médicale de la Loire-Inférieure, sur la fièvre typhoïde qui a régné épidémiquement à Vieille-Vigne en 1835, par le Dr. Faurré). Gazette Méd. 1838, page 152.
With all these facts in hand, we are astonished that any one can entertain a doubt as to the origin of Typhoid Fever. We are aware that those who differ from us, will argue, that the concurrence of the circumstances we have just stated above may have been nothing but coincident. We shall not follow our opponents on the field of suppositions. It is a remarkable fact that all those who deny the influence of miasmata (arising from animal decomposition) as originators of Typhoid Fever are nevertheless very reluctant in stating what, in their opinion, is the cause of the scourge, which according to statistics sends in Britain alone hundreds of our fellow creatures to their grave every year. In our opinion it would be absurd to think that the miasmata which for the presence of which had been observed during the epidemics above mentioned are the result of a mere coincidence. It may be objected whether the disease was really Typhoid Fever and not some other affection assuming the Typhoid character. To this objection our answer is: the reputation of the observers leaves no doubt
as to the accuracy of their diagnosis.
Dr. Lovet and Dr. Bourgeois, who witnessed
two epidemics in Belgium and Beauvais 1846-47
and 1848 respectively, both come to the conclusion,
that gronds of stagnant waters in a state of
putrefactive fermentations matters such
as the dung and urine of beasts, vegetable
and animal debris lying on the streets and
yards adulterating the waters intended for
the supply of beasts and men; low, damp
and over-crowded houses in which poultry,
rabbits and pigeons are kept, disgusting
shrewdness etc. are all hygienic conditions
which give rise to the development of most
fatal diseases. L'Union Médicale 1848: page 121.
Dr. Martin goes a little deeper into the subject
and justly calls our attention to the meteorological
conditions. He says: 'If rain falls assiduously
during three months (as it happened this
year) with a low temperature followed by
a really tropical heat, we have immediately
and necessarily the formation of miasma
and effluvia which cannot fail to evaporate.'
Mons: Louis who has devoted almost more of his time than any one else to the study of Typhoid Fever, unconsciously admits the influence of miasmata in one of his cases in which Typhoid fever was caused by the use of putrid water in which straw had been steeped for some time; he says: "Les symptômes aussi bien que les lésions observées lors de l'autopsie cadavérique, étaient les mêmes que ceux que l'on observe chez les sujets qui se trouvent dans les meilleures conditions hygiéniques" (Recherches sur la fièvre Typhoïde 2nd edition 2nd volume, page 631). Mons: Louis calls this a coincidence while we hold it to be a conclusive fact in favour of our doctrine; for if the symptoms during life and the lesions found after death are the same in subjects who are in the best hygienic conditions, as in those whose system has been contaminated by putrid matters, therefore it is evident that we must look upon putrid animal and vegetable matters as a direct and immediate cause of Typhoid Fever.
From what we have said as to the Origin of Typhoid Fever we cannot conclude (without saying a few words about the prophylactic treatment) for the noble mission of the physician does not only consist in the art of treating & curing diseases, but also in using means to shield our fellow creatures from them. The means to defeat the pathogenic causes of Typhoid Fever belong to Public as well as to Private Hygiene. It is the duty of the former to prevent as much as possible the accumulation of decomposing animal matter on the public thoroughfares, against stagnant waters either from rains or otherwise, against dunghills and above all against bad drainage. So the latter we must look for the prevention of infecting the habitations from putrid emanations proceeding from improper arrangements or attendance to the Water closets, from over-crowding & in fact from all means which may give rise to putrid exhalations, and we firmly believe that when these precautions will be more attenda
to if Typhoid Fever is not erased from the Medical Practice, they will at all events have the benefit of diminishing the number of victims, (not only in this but in other maladies as dreadful in their results,) and thereby we shall see and feel the whole benefit of the ancient proverb:

Cleanness is next to Godliness.