Thesis on

Typhoid Fever:
Theoretical differences and Therapeutic difficulties.

by

John Adam
In 1846 the Rev. Christian writing of an outbreak in Pekkle says that "its want of resemblance to the ordinary habitats of Typhus struck the attention". Sir Wm. Jenner between 1849 and 1853 demonstrated the dependence of Typhus and Typhoid Fever on different causes. According to Dr. Mitchell Clarke (B. M. Smolal Jan 31, 1880) the original discovery of this distinction is not due to Jenner for there were prescarnings of it from as long ago as the year 1836; "but that belongs the credit of making it a firmly established medical".
Typhoid or Enteric Fever, though only within a comparatively recent period, described and recognized as a distinct disease, has perhaps been a subject of investigation attracting more attention than almost any other epidemic disease. Its etiology was, and still is so frequently, shrouded in mystery; its pathology is obscure, and yet so characteristic; its symptoms, so diversified and yet, during its course, so diagnostic; its treatment, scientifically so unsatisfying, yet practically so frequently efficacious, that it is not to be wondered at that a malady such as this should have attracted the painstaking attention of the most successful investigators, both medical and scientific. Already many theories have been advanced as to the nature of the disease, many drugs have been credited with, and soon denied, specific virtues in the treatment; heroic measures have been advocated and abandoned; science has done much to unravel the mysteries of its origin and propagation, while medicine has
Huchinson (page 435) says "Some excellent observers still adhere to the doctrine of identity and maintain that it is impossible to distinguish the symptoms or lesions of the two fevers," Typhoid and Typhus.
attempted to follow in its wake, by adapting its treatment to that view which at the time appeared the most satisfactory. Yet, even at this present day, there is no unanimity, either as to the nature or the treatment of Enteric Fever. Notwithstanding all the discoveries of modern sanitary and microscopic science, antagonistic or inconsistent theories have still world-wide credence. And when so much divergence of opinion exists among those who have so carefully investigated its phenomena, when even they so extensively disagree, it is only natural that the young practitioners, when first brought face to face with an outbreak of Typhoid Fever, should feel a weight of responsibility, and experience unusual difficulties. Having during the past three years, had several opportunities of studying the phenomena of the disease, and of experiencing the practical and scientific difficulties by which it is beset, I intend, by referring to some of the more outstanding Cases, to illustrate some of the theoretical differences as to the nature, and some of the
J. Buchan says "It is impossible to deny that
Enteric fever is in some way communicable by the
sick to persons in health." See page 465.
practical difficulties in the diagnosis and treatment of Typhoid Fever.

Etiology. The cause of an outbreak of a fever is not the first problem to be solved by the physician, but in treating of the disease, historically, its cause and nature first demand attention. That Typhoid is a distinct fever is not generally accepted; that it is Contagious, in a modified form, a likewise seldom called in question. Some septic agency transmits the malady from the affected to the healthy. What that morbid element may be is still a question of mere theory or hypothesis. Some septic matter gets access to the system, and the result is a febrile attack, each fever having its peculiar local manifestations. What then is the nature of this infecting agency? The answer opens up the great question of Contagion. The time has passed when "Infection" was regarded as an invisible, intangible, almost spiritual agency, possessing a mysterious disease-spreading potency, which was most fatally exercised over the weak and panic-stricken of the community.
Opinions on this point vary.
into whose midst it had entered. Its advance was believed to be irresistible, and consequently the only thought of those in an infected district was to have recourse to flight. Having such erroneous ideas as to the nature of contagious diseases, they did not, nor could they, imagine that with themselves lay the powers of modifying, if not preventing, the ravages of infectious diseases.

But now this infecting principle or agency is regarded as a natural entity. It has a tangible existence, though requiring for its demonstration powers higher than those of the modern microscope. Some authorities maintain that any albuminoids or organic matter in a state of rapid change – i.e. decomposing – may become the essential element of infection. But it is by the ability of a theory to harmonise with the several phenomena that it can satisfactorily claim to be a correct one. Tested by this standard, there is no theory which appears to explain the mysteries of Contagion so rationally as the now famous Germ Theory of disease. According to it, all the symptom
Dr. Macleay in the germ theory discussion at the pathological society said "I think, indeed, it is still an open question whether true disease-grens have ever been seen."

An outbreak at Catterham is shown by Dr. Thorne to have arisen from the contamination of the water of the water company by some splashing of typhoid stools - 305 persons being in consequence attacked.

Prof. Haller has demonstrated and described the parasitic fungus of each acute specific disease. (1868) Dr. Audou (page 99) says "This is a firm belief that the specific grens which cause Contagious fevers are, in reality, so many living species."

See Dr. Roberts' Handbook of Medicine, page 87.

Mr.
diseases, and probably some classified otherwise, are their origin to the entrance into the system of organisms, either animal or vegetable, so minute as in the opinion of some authorities to have eluded all the powers of microscopic research, and yet so powerfully noocinetic that introduced into the system even in excessively minute quantity, they give rise to all the phenomena clinical and pathological, of the gravest fevers. A point of great interest is whether each disease has its peculiar germ or poisonous agency. That such should be the case is a priori to be expected, and the results of scientific investigation seem to point to the probability of the existence of essentially different germs in the various zymotic diseases. In the vaccine lymph in relapsing, marasch and typhoid fevers, minute organisms have been detected. Are these the cause, or mere concomitants? Much has yet to be done to clear up this point, but interesting experiments have been made with vaccine lymph which support the hypothesis
At the meeting of the Académie de Médecine, M. Pasteur submitted the results of his experiments on Paul-Cherbon. If a tube containing the virus were allowed to stand, the germ fell to the bottom. If the whole fluid portion, though inoculated, would then sterile. The lower layers, un inoculated, would cause decay and death.

(Professor Race 1865 & 1871. Cameron 1870)

Roberts Page 82

Prof. Smith, at page 363, vol. 2, of M. Journal for 1862, says that "the Bacillus Anthracis is most universally recognized among pathologists as the cause of plague fever." He also says, with reference to the experiments of Pasteur mentioned above, that "this was pretty conclusive evidence that the organism was the cause of the disease, and that it constituted the true infective element."
that these organisms are an essential element in these diseases. Much more, however, asserts that they are the consequence, and not the cause, of the diseases. But the experiments of Pasteur [1] were made after the above was written.

Beale and Sanderson are of opinion that these parasites are not the mortific agent, but that the virulence of contagious fluids is due to the presence of minute solid particles from the human body. Beale also holds the opinion that the septic agencies of the various fevers differ only in vital force. Still the parasitic origin of contagion seems to offer the most satisfactory explanation of the phenomena. The incubation stage is easily accounted for, if we assume that the Contagia Viva often enter the system in extremely minute quantity, that they there multiply, and must do so, before the system becomes so affected as to develop the characteristic symptoms of the particular symptomatic disease. It also gives the best explanation of the cessation of fevers - the germs multiply to such an extent that
They exhaust their special habitum, the disease being thus "starved out." But the occurrence of one fever does not protect the system from the others, except where the diseases are believed to belong to the same species. This fact goes to prove that the germs of the various zymotics must have essential differences, as much as the habitum suitable for the germs of one disease may be used up, and yet not prevent another disease from "running its course" immediately thereafter. Accepting then provisionally at least, the germ hypothesis, and the existence of specific organisms as necessary in the causation of each zymotic disease, we come to the question of mediate and immediate contagion. Most germs are held to have the power of transmitting the disease, peculiar to them, to the healthy, directly. They are emitted from the bodies of the affected. These are immediately contagious, and are further believed to be present in the breath and in more or less of the bodies of the infected. But
Dr. Russell, however, at page 38 of work on Typhoid says "all the
symptoms from the rectum are in a certain degree infectious" but "what
a great deal from the intestines is incomparably more virulent than anything
In the Cottman lectures he says "the experience of the
London Fire Hospital pretty conclusively proves that the
rectal stools are innocuous"
See Cottman lectures pages 20-21.
Prof. Grafton Steward in his Practice of Physic lectures
This describes the Etiology of Typhoid. It is "Caused by
Endemic influences, apparently originating from the decom-
pination of organic matter, and certainly Communicable
though only slightly Contagious."
Murchison describes it as "an Endemic disease,
generated and propagated by certain forms of
de-composing organic matter." (Page 417, Fevers.)
Several writers in the B. M. Journal for November 6, 1880
support the theory that Typhoid is direct, and that
consequently Intercussion is not essential to the Septic
germs possessing Contagious properties. Dr. Murphy,
however, writing in the same Journal (page 737) says that
Dr. Callie, who advocates this view, has eliminated a deadly
ventilated but pipe from being a possible of the outbreaks
caused by him in support of direct Contagion.
The germs of Typhoid Fever are believed to be only present in the stools of Typhoid patients, which, when passed are innocuous. The germs have to acquire Contagious properties—i.e., they are only mediately Contagious. Dr. Caffrey says that in twelve hours they have been known to acquire Contagious properties. Antiseptic is essential to the germs becoming Contagia vivax.

In decomposing organic matter, the Typhoid germs multiply and maintain their vitality for indefinite periods. Thus it is that some hold that decomposing organic matter is itself the mutrophic agency in the causation of Typhoid. The advocates of the germ theory, however, maintain that this matter is the habitat of the septic poison; that it acts as the necessary medium of Contagion, not as the Contagious principle itself. The effects following the introduction of decomposing matter are various, however that there must be some explanation of the endless variety of symptoms produced. Typhoid Fever, Dysentery, Gastroenteritis, or merely a passing gastro-intestinal
Overwhelming weight of evidence is at present in favour of indirect Contagion.
intestinal catarrh follow some hygienic defect, permitting noxious gases to be inhaled, or contaminated water to be drunk. If the exciting cause be the same, nothing more and nothing else than organic matter in a state of decomposition, it is difficult to account for such variable effects being produced at different times, and to explain, on the other hand, how the symptoms of a particular ailment should be so uniform. If it be granted that this decomposing matter may contain different germs at different times, a satisfactory explanation can at once be given of this variety of epidemics, and of the reason why one disease should become epidemic any more than the others.

Another question, of much scientific and no little practical interest, is whether the germs of typhoid fever can originate spontaneously from decaying matter, or whether they can arise only from pre-existing typhoid germs. Dr. Huncvon advocates the spontaneous or "pyrogenic"
Trousseau (Clinical medicine vol 2, page 374) says "We cannot refuse to admit the possibility of its arising spontaneously, although we hold that it is acquisitional.

Menzer (Practical medicine vol 2, page 575) says "The miasmatic origin of abdominal typhus is rendered probable by cases occurring in places removed from travel, where no cases of this disease have occurred for years, and where there is not the slightest suspicion of a contagious origin."

b) Continued fevers - page 484

c) Croonian Lectures - pages 13 and 14

d) Vide page 12.
origin of the disease. Dr. Budd opposes this denovo mode of origin. Many cases, at first sight, appear to favour the view of Dr. Murchison, but it has frequently been shown that cases, believed to have had a pythogenic origin, have in reality arisen from an unsuspected but previously existing source - the living, though hitherto latent, germs of a former attack. Indeed so many properties, vital and genetic, are postulated for the germs of Typhoid Fever, that it will be difficult, in almost any outbreak of the disease, to disprove the possibility of its having migrated from the septic poison of some previous case. Dr. Murchison acknowledges that he labors under a great disadvantage; he has to "prove a negative". Dr. Caley, in the German lectures, gives an instance of the germs maintaining their vitality for nine months, and add, that there is no reason why they might not retain their infecting power for an indefinite period. He also adds that cases of undoubted Typhoid occur during an outbreak, which, occurring
The two medical men who attended these cases differed in their diagnosis. One of them calling the illness Typhoid; the other, Influenza. The character of the stools, however, pointed to its being Typhoid Fever.
Sporadically could not be diagnosed. If the supporters of the Pyrogenic Theory were to admit the correctness of these opinions, they would find the difficulties in assailing the opposite theory well-nigh insuperable, since to establish the spontaneous origin of any outbreak they would have to disprove the possibility of the pre-existence, even at a remote period, of the septic organisms of a previous attack. During the last few years I have witnessed several outbreaks of Typhoid Fever. They all occurred in villages and in the surrounding districts. Several of these were situated in the North of Scotland, but I cannot adduce any of these in support of the one theory or the other. In each of them, with one exception, the water supply was found to be contaminated with organic matter. In the case excepted, the epidemic was widespread; the symptoms were somewhat exceptional, and no satisfactory explanation of the cause could be arrived at. Finally, however, I attended patients in two outbreaks of unmistakable Typhoid Fever. In one of these the weight of
Evidence seemed to support the non-pyogenic, or the other, the pyogenic hypothesis.

The first outbreak (A) occurred in an isolated house situated near the summit of the long ridge which extends through the peninsula, commonly called the Black Isle, in Ross-shire. The house was tenanted by two families, the two men being agricultural servants on the farm on which the horse stood. There were no drainage arrangements, and no water closets, neither was there any explanation of the outbreak in the immediate neighborhood of the dwelling. In the last week of July 1880, the eldest daughter (21) took to bed. Five days afterwards her father was compelled to do likewise, and a fortnight thereafter two sons, boys, took the disease. A little boy of three years old, and the mother also, while the sons were lying, had diarrhoea and temporary feverish symptoms. A still younger child had no symptoms. In the adjoining division of the house, while the father of the family, already mentioned, was laid up, his fellow labourer was seized with similar symptoms.
He had headache, abdominal pain, diarrhoea of an ochre colour, chill, and a temperature of, at its highest, 103. In less than a fortnight he was Caralescent, but extremely weak, and considerably emaciated. His wife also fevered and had abdominal pain and diarrhoea. The daughter, already referred to, had the characteristic tongue, diarrhoea, rose-coloured eruption, enlarged spleen, Bynclitic rales, and a temperature at its highest, of 104.8. The second of the boys was for 7 days almost constantly delirious, with a temperature varying from 102 to 105 almost. He had deafness of both ears and severe Arachnites. The father and the elder son had the usual symptoms well-marked, but not severe. Towards the end of the third week, Caralescence began in two cases. The fever lasted longer in the other. Here then was an outbreak, in which there were typical cases, alongside others, which, occurring separately, could not with certainty have been diagnosed.

The summer having been a dry one, the
well, from which they and several other families drew water, was not sufficient for all, and consequently these affected families had used the water of a well in the garden of a neighbor. This water, on being examined, was found to contain a considerable amount of organic impurity. No trace of a history of Typhoid contamination could be got; but, according to the view of Dr. Macleish, the presence of this organic adulteration was sufficient to account for the spontaneous origin of the Typhoid poison. But it transpired that the first mentioned well, although disused for over a month for household purposes by the infected families, had daily supplied the workers on the farm, who drank freely of the water, owing to the excessive heat. This well was situated immediately beside a ditch or drain, conveying water from the summit of the hill. One part of this open stream was retained in a pond, immediately above the farm steading, for milling purposes; the other part widened out opposite the steading into a duck-pond. These divisions joined each other a short distance above the
well, and drained off all the farm-yard refuse. The well and drain being so close to each other, it is quite possible that the running water may have percolated through the thin partition separating them. But when, in addition to the usual stream, the contents of the mill-pond were let loose, it has often been observed that a part of it fell into the well, the water of which became dark. The well, therefore, very possibly constantly, and certainly periodically, was rendered impure from the addition of decaying refuse of all kinds. Three years previously, eight members of two families, living in a house within a few yards of the stream, had Typhoid Fever. This house was, at the time, occupied by the farm servants. It was distant about 300 yards above the farm-steadying, and about the same distance from, and the same level with, the house in which those infected in 1880 resided. The following summer—1878—a young man, who lived at the farm-house, was cured with Typhoid, and nor—1880—five unmistakable cases of the
same fever occur. It appears also that Typhoid Fever has been endemic in the neighbourhood for about 15 years, but I failed to get an authentic account of any cases beyond those mentioned.

I examined the water of this well during the outbreak of 1880, and found it contained a large quantity of organic matter. Solutions of Permanganate of Potash were quickly oxidised, and the water, when boiled, emitted a disagreeable odor. It is therefore most probable that this water has been the cause of these latter outbreaks. The Typhoid Bivis would be easily by the infecting medium—the stools—Carried from the upper house into the drain, and thereby into the well. It might lie dormant there until the following summer, when the heat would favor organic decay, thus re-exciting the morbid activity of the specific poison. The young man would thus become infected, and his stools would again be carried to the well. Two years thereafter, the drought
Authorities such as Ortil, Andral, Rousseau &c strongly insist on recent residence as a cause predisposing to Enteric Fever.

Marchion at page 456 (Continued Fever) says that upwards of 6 per cent of the patients admitted into the London Fever Hospital had not resided in London three months before the date of their admission.
world once again give the virus a suitable
medium for propagation and the power of infecting
those who might use the water. In confirmation
of this view of the etiology of the outbreak,
it is noticeable that, of those attacked in 1880,
the first to show symptoms of the disease were
the outdoor workers. The young girl and the
two men, alone of these families, partake of
this water, and they developed the Typhoid
symptoms, several weeks in advance of the
others, whom may have caught the disease
from the stools of those already attacked.

An interesting coincidence, if nothing more, is
observable in the three outbreaks specially
referred to. All those attacked have been
farm servants and their families, who, until
some months previously, resided elsewhere. None
of the natives or old residents, although
using the same water, were infected. It is
therefore probable that strangers are much
more susceptible to the septic influence of the
Typhoid virus than those who have constantly
Typhoid Fever is found to be unusually prevalent after summers excessively dry and hot. Numerous outbreaks of this fever occurred during the summer and autumn of 1846, which were remarkable for their great heat.

In the A.M. Journal for January 17, 1880, Dr. Colley supports the view that Typhoid fever is contagious and that it spreads from person to person directly.
resided in the district. Popularly the outbreak of 1877 was attributed to the state of the house, which no new servants could be prevailed upon to occupy. The James had, in consequence, to get possession of the house in which their attacked in 1880 resided.

These cases seem to favor the non-typhogenic theory. They all occurred during the hot season of the year, thus supporting the belief that a putrefactive medium is necessary to develop the contagiousness of Typhoid fever germs. But the well in the garden contained putrefactive elements, and yet it does not seem to have been the cause of a single case. No history of Typhoid contamination could be got, and thus, according to Dr. Cayley, re, account for the invincibility of the water.

The second outbreak (3) occurred, in October 1880, in a small hamlet or village on the southern shore of the County Firth. The infected house was the most elevated in situation, and there was no explanation of the outbreak to be got from
an inspection of the house or on the house. The mother and two daughters were attacked within ten days of each other. The family had been using running water from an open drain which passed behind the house, at a distance of about 30 yards. This stream emptied itself into the ditch and ran to one side of, and in a line with, the stable and horses. Several of the villagers, for the sake of its nearness, used this water, instead of the usual water supply—a well at some distance from the village; but, at the time of the outbreak, none would confess to using it except the infected family. Cows were kept by this family, and also by a man who lived a short distance above the village. The occupant of a house further down informed me that he would not allow the ditch water to be used by his family, except for washing with, as he often detected in it a disagreeable odor of the byre. At the time of the outbreak the water contained organic impurity.

Eight years previously, an outbreak occurred in
See Aslam Lectures, page 35.
the latest house in the village, and two years
previously, 1878. Several cases occurred in a
house about the middle of the village. Nor is
it difficult to fancy that the typhoid virus
could be conveyed from the latest house
to those situated at a lower higher level.
Further, no history of typhoid contamination
could be arrived at within a considerable
distance of the village. But the stream arises
in the moss several miles distant, and it might
be urged that typhoid stools might be added
to it during some part of its course. But,
according to Dr. Carley, the germs are sometimes
innocuous by being exposed to the air in an
open stream.
In these cases, then, there is no proof of any
previously existing source of infection. These cases,
therefore, are provisionally, at least, admissible
in support of the Pythagoric origin of the fever.
Dr. Kuchin adduces many similar cases of
sporadic outbreak. And in support of his
theory there is the argument that the disease
Rousseau (Chirural Medicine Vol 2. Page 374) says "It is obvious that Typhoid Fever, at one time or other, had a beginning."

b) At page 26 of the Cosman lectures, Dr. Canby says "According to Professor Negrenin, the meat (veal) had two injurious qualities—first, it was putrid; second, it was infected with the specific typhoid poison."

(Program) "He (Prof. Negrenin) has convinced himself that Typhoid Fever is not uncommon among cattle in Switzerland, and that the flesh is often eaten without any injurious results, some intangible changes being necessary to develop the infectious property."

Professor Sanders Lectures in Pathology 1877-78
gem must at some time have arisen spontaneously, and that, consequently, the condition which brought the disease into existence, may conceivably still exist. But the investigations of sanitary science are daily lessening the number of these apparently spontaneous outbreaks, by showing that such cases often arise from some unsuspected source, such as a case of ambulant typhoid, or an analogous disease affecting cows, &c. Thus the outbreaks last described may possibly have arisen from such causes, although it is impossible to ascertain it. It seems therefore that typhoid does not rarely occur spontaneously, but in the great majority of cases it arises from a pre-existing cause. Although the typhoid, like other syphitic poisons, has eluded all attempts to isolate it previous to its entrance into the system, yet Dr. Klein has succeeding in detecting minute vegetable organisms in the intestinal ulcers, which he believed to be the infecting principle, the contagium vivum of typhoid fever. Proof
Such a discovery would have startling therapeutic results, at the least. The experiments now going on with the micro-organisms of Spleenic fever point in that direction. Professor List, at the Cambridge meeting of the British Medical Association, referred to M. Fournier's experiments. Blood, taken from a sheep dying from Spleenic fever, deprived of its germ, the Bacillus Anthracis, is injected into the circulation of a healthy sheep. It produces a true vaccinating effect; it secures an immunity from Spleenic fever. Professor List has expressed the hope that these experiments may yet be the means of discovering "the appropriate vaccine for Measles, Scarlet Fever, and other acute specific diseases in the human subject."
Moreover it is yet wanting to establish these being the cause, and not the accompaniment, perhaps only occasional, of the disease. Klein is further of opinion that each typhoid disease has its peculiar tyne, germ, or organism, and that these may be detected by the microscope. Pake holds, on the other hand, that the disease-germs are not parasites, but particles of trophisms, only differing from each other in vital power. Other authorities hold that the true disease germs have never yet been seen.

All of these, however, agree that a germ-theory is the most satisfactory hypothesis to explain the phenomena of typhoid diseases. It may therefore not be absolutely chimerical to hope that, by some means, if necessary more searching than the microscope, the various disease-germs may yet be recognised and distinguished.

**Symptoms and Diagnosis.** Typhoid fever has fewer more insidious in its early stages. Its incipient symptoms may be endlessly diversified.
(a) Muchison mentions a case where the eruption was Copias. I have also seen a similar case which was also a favourable one.
It may begin abruptly or gradually. Premonitory symptoms may be almost or entirely wanting. The initial symptoms are generally so obscure that a sporadic case is frequently not diagnosed until the characteristic tongue, or the scattered pathognomonic eruption, has unmistakably revealed the nature of the illness. Most of the typhotic fevers have one or more early and external diagnostic marks, which make a prompt detection of the disease always possible, and seldom difficult. Scarlet Fever generally presents a characteristic rash on the 2nd day; Measles, on the 4th day; Typhus, on the 4th or 5th day; Varicella within 36 hours; Small-pox on the 4th or 5th day, etc. These eruptions are only exceptionally absent, and they are, as a rule, distributed over the whole body. But the rash of Typhoid Fever, though characteristic is often wanting during the whole course of the disease. When present, it early appears before the 7th day, and, instead of a diffused eruption, in the great majority of cases only a few scatteredspots appear. The mode of ascent of the temperature
H. Münchm. had a case, where the glands were enlarged, which is depicted on page 613 (Continued there).

At Clapham Münchm. says enlargement was found at the end of the first day.
is distinctive during the first four or five days, but the first case, in any outbreak, in which an early diagnosis is specially difficult as well as desirable, is generally not seen until after the first few days are over. The lesions of the intestines are said to be invariably present in every case of Typhoid. No other symptom or pathological condition exists, which may not be wanting. Dr. Murchison states that the characteristic deposit has been met with on the first or second day. Irons says, gives the earliest date of deposition as the fourth day of the disease. But unfortunately, if this pathological condition be so invariably present, it frequently gives no palpable evidence of its existence during the life of the patient. Cases are often met with, which, throughout, are characterised by little tympanitis, gurgling, or abdominal pain, and by a total absence of diarrhoea. In the outbreak (3) already referred to, an interesting example of this indifference of the early symptoms, and of the abnormality of a cause, of Typhoid Fever.
At the Medical Society of the College of Physicians of Ireland, on January 7, 1880, several examples of this want of correlation between the pulse and temperature were brought forward.
presented itself; while the endless dissimilarity of the phenomena of the disease is well illustrated by a comparison of the three cases.

The youngest daughter was first attacked. Her mother brought her across the first for advice, and informed me that for ten days she had been "falling off" and losing her appetite. I found her pulse quiet; respirations not much accelerated; tongue purer posteriorly, edges almost normal. She had a dull, listless expression; she persistently hung down her head; and her gaze was fixed on the floor. The symptoms simulated the incipient stage of Tubercular Meningitis, especially as the bowels were constipated and the abdomen not distended. Two days afterwards, I visited her, and found the emaciation increasing. She was pale, with a dry skin. Her respirations and pulse were natural—the respirations were somewhat increased in number, but extremely quiet, but the pulse was 76. Hearing that both her mother and sister were feverish, I used the thermometer and found a temperature
<table>
<thead>
<tr>
<th>Nerve Symptoms</th>
<th>Occasional</th>
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<tbody>
<tr>
<td>Occurrence</td>
<td>Right foot</td>
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<tr>
<td>None</td>
<td>Sleep. Rule good</td>
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<tr>
<td>Intermittent</td>
<td>Clear.</td>
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<tr>
<td>Baby</td>
<td>Clear.</td>
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<tr>
<td>Fever</td>
<td>Clear.</td>
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<tr>
<td>Age</td>
<td>10</td>
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| Age            | 23        |
| Sudden Chills  | Fever. |
| Headache       | Characteristic. |
| Fever.          | 14.6    |
| Sudden Headache | Characteristic. |
| Chills.         | Fever. |
| Characteristic. | Fever. |
| Characteristic. | Fever. |
| Characteristic. | Fever. |

| Age            | 10        |
of 103.4 in the axilla. Thus, instead of Tu-
bercular meningitis, the disease gradually turned
out a case of Typhoid Fever. The inflammation
became extreme, as there was great anorexia. But
at the end of a month, convalescence set in by
a rapid lysis; the appetite immediately im-
proved; there was no relapse, although an
attack of diarrhea supervened three weeks
afterwards. During the course of the fever, the
Constipation was persistent, and no bad effects
followed from periods of 8 to 12 days intervening
between the motions.
The symptoms of the three cases — occurring as
they did in one family — were so variable that
they present an interesting example of the
proverbial dissimilarity of the clinical phenomena
of the disease. Instead of describing each
case separately, I made an attempt on the
opposite page to tabulate the most important
of their symptoms.
The dissimilarity of symptoms necessitated
different modes of treatment, and under that
Dr. Waters, thermometrical has found that, in a large majority of cases of Measles, the temperature attains its maximum about 7 P.M.; whereas, as a rule, the temperature in Encepha fever is higher at 9 P.M. than at 5 P.M. This difference may help in the diagnosis of a doubtful case. (Footnote, American Medical Journal, Aug. 14, 1880.)
heading they will again be referred to.
Thus the detection of Typhoid Fever, especially during the first week, and while there is no suspicion of the presence of the element of "Contagion," is often a matter of much difficulty. It is often confounded with Acute Phthisis, Tubercular Meningitis, Influenza, &c., but as a rule its real nature eventually becomes quite apparent. Though an early diagnosis, for hygienic and other reasons, is desirable, still, in the present state of therapeutics, it is not essential, as the treatment of the disease is as yet symptomatic, not specific or radical, as it may yet become. As a further example of the difficulty of an early diagnosis, the first case in an outbreak of Typhoid in the village of Inverloch, three years ago, may be adduced. A man, about 20 years of age, complained of loss of appetite, and disinclination for work. The tongue was furred, and the stools constipated. The pulse and respiration were not noticeably accelerated, and as the patient was walking about
The temperature was not ascertained. Four days afterwards he had copious epistaxis, which was stopped by injecting Bichloride of Iron. Next day it recurred, and, although again checked, the patient in about 36 hours succumbed.

By that time his sister was ailing, symptoms of Typhoid soon developing. Very soon thereafter the fever became general throughout the village.

All the patients treated in 1860 recovered, and as I had no opportunity of examining the intestinal and other lesions in the fatal cases which occurred in Berkshire and Berwickshire, I shall next refer to the subject of the Treatment. The treatment of Typhoid fever has already been said to be unsatisfying from a scientific point of view. All that therapeutic skill is at present able to do is to prevent the occurrence of non-essential and dangerous phenomena, and to modify the severity of those which are unavoidable. There is no method of treating Typhoid which can yet claim to
The laxative or eliminative treatment has been recommended by Dr. W. T. Dunsley and J. Johnston. In certain cases, it seems to be that of Dr. Dodd's. Restraining diarrhoea and haemorrhage in typhoid fever, and when you have fairly locked up the bowels, keep them so. Patients will go on well.

For four or five days longer, without suffering in convenience from this state of constipation. (See Clinical Lectures, Dr. Bristow, in the A.M. Journal, Volume 27, 1880.)

"To look on the diarrhoea which is due to the entire lesions as eliminative into look upon these lesions as centres of elimination, and is equivalent to regarding the eruptions of the eruptive fevers, which are mere foci for the growth of the poison, as organs developed for the discharge of poison pre-existing in the blood-vessels, which is manifestly absurd when applied to the pustules of smallpox or the tubercles of syphilis."

Also says, "The motions are not, except in a specific sense, primal.

Vide Munchian on Typhoid Fever, page 394."
do more than heal the various symptoms. The Eliminative method does attempt something more. It views the various phenomena - the eruption, the diarrhoea, etc - as efforts on the part of the system to get rid of the poison, and the aim of treatment, according to this theory, should be to encourage these eliminative attempts of nature. But the theoretical defects and practical dangers of this view are sufficiently manifest to deter practitioners from acting on it. The diarrhoea, e.g., though it may eliminate a part of the poison, helps to weaken the patient, increases the intestinal peristalsis, and thus favours the occurrence of haemorrhage and perforation. So that the evil effects of diarrhoea seem to much outweigh any benefits which theoretically might be anticipated from its encouragement. And further, the existence of constipation throughout the course of the fever does not appear to lead to any injurious results.

Dr. Murchison says: "No fact appears to me the better established than that the severity and dangers of this disease are in direct proportion to the intensity of
the diarrhoea.

Thus the practitioner, generally, devotes his skill to modify or mitigate the symptoms characteristic of Typhoid and the other symptomatic diseases. He guards against complications and sequelae; he uses disinfectants to neutralise the poisonous eliminations, respiratory or secretory; suitable food and stimulants to support life until the septic agency is literally "starved out" of the system. No treatment is entirely symptomatic or expectant. The effects, and not the cause, are operated on. And yet this method of treatment, theoretically weak though it is, is fortunately in the great majority of cases so successful that the lives of the infected are saved, treated and emaciated though they be by the fever "running its course."

The first thing, in every case, in addition to securing a clean, comfortable, and airy room, is to pay peremptory attention to the Diet. Milk is now regarded as almost a sine qua non in dieting Typhoid Patients. On it alone, they subsist satisfactorily for weeks, without
it, none can be well treated. It is well tolerated easily digested and assimilated; and at the same time eminently safe and soothing to the diseased and ulcerated intestines. Patients, fed on milk alone, resist the emaciating effects of Typhoid as well, if not better, during the continuance of the fever than those allowed a mixed diet. One of the patients whose outstanding symptoms have been already tabulated—the eldest daughter presented an example of this. She, along with her mother and sister, was at first allowed beef tea, farinaceous food, along with milk. The beef tea had pain to be stopped, as it brought on a tendency to diarrhoea. The farinaceous food caused a sense of weight at the stomach, abdominal pain and swelling. Casley gives a reason for these effects—the starchy food is not assimilated because of the deficiency of the salivary and pancreatic secretions. The patient thereafter, for five weeks, had nothing except milk with lime water, and small daily quantities of Brandy, except on
The infants whom I attended were allowed as much milk as they cared to drink.
one occasion, to which I shall afterwards refer.
At the end of the fever, she was better nourished
than either her sisters or mother, the former of
whom had a mixed diet all along, because of
her repugnance to milk, she took very little
of it. After the mother had been restricted to
milk, a later period, however, than her daughter,
the symptoms were more favorable. Except in
cases of prolonged Constipation, I ceased giving
beef tea. In these cases it acted well, when
given cautiously. Except for this purpose, it is
saefer, while the febrile symptoms, and even for
a few days after defervescence, to withhold all
fluids of food, except milk, which should be
taken at frequent intervals, and may be safely
taken in large quantities.
The condition of the tongue is often regarded as a
guide in liberalizing the diet, but, isolated to
alone, it may prove misleading. This was well
shown in the case of the daughter, already
referred to, whose tongue was unusually clean
throughout the disease. During the third week
of the fever, a nurse of much experience in the care of cases of fever, came to attend the patients. Seeing the tongue so clean, and hearing bronchitic râles, she had disbeliefed my diagnosis, and pronounced the case to the friend to be one of Bronchitis. They, thereupon, without time, gave the patient, among other things, porridge and milk, biscuits, and some fancy bread. Two days thereafter, an alarming attack of haemorrhage from the intestines appeared. Nothing but milk was of course thereafter given, and the haemorrhage soon ceased. But a severe relapse followed, accompanied by abdominal pain, more or less constant, and which generally foretold an attack of diarrhœa, when severe medicines. So far as I have seen, medicines, if there are no symptoms so severe as to demand special remedies, do not have much effect on the disease. Dilute acids, and belonging mixtures, though generally given in such uncomplicated cases, did not appear to materially
Sympathetic was treated by turpentine stripes. Insomnia by Promise of pitch and Chloral, or Opium.
affect the course of the disease. But when any symptoms, natural or accidental, become severe, it must at once be checked. The diarrhoea often requires appropriate remedies. In my first cases I used a mixture of chalk, opium and Kino. But in one case the pain was even more urgent than the diarrhoea, and both were at once relieved by a large dose of morphia. In that and other similar cases afterwards administered one grain pills of opium every 2, 4 or 6 hours, according to the severity of the symptoms. They seemed, in several cases, to exercise almost a specific virtue, so great was the alleviation of all the disagreeable symptoms. Sleeplessness was often removed; the delirium was lessened in consequence, and the patients in every way felt refreshed. Hemorrhage is generally believed to be a dangerous complication and one demanding prompt attention. Graves however thinks that some cases are benefited by it, but the great majority of treaters look on it as a cause of
Machismo a-leveiro, page 027.
imminent danger. Much of opinion that patients are never benefited by losing blood, and that those who survive from an attack of bleeding run an unusual risk of dying from Peritonitis. In the few cases of haemorrhage I have had, although Copious in several, it did not occasion any well-marked peritonitic symptoms. Lead and Opium pills are recommended, but simple Opium pills appear to act quite as beneficially. The cessation of the bleeding seems to be due more to the action of the Opium than the lead. The Opium lessens or even checks the peristaltic intestinal action, the blood in the ruptured vessel coagulates, and the clots are not so readily displaced. By continuing the opium for some days, the decreased activity of the intestines favours the healing process.

Aperients and Enemata. In many cases of Intestinal fever there is Constipation throughout the disease. Unbroken Constipation may last for over a week without any harmful effects. In some cases, Castor oil may be safely administered,
but in others it may cause severe and even alarming diarrhoea. The presence or absence of abdominal pain seemed, in some of the cases attended by me, to be an indication for its being administered or withheld. If there be no pain at any time complained of, Castor oil may be given with hopes of a satisfactory result. But if there have been pains over the bowels, it seldom occurs he uses. A patent of mine had been ten days without a stool. Large quantities of beef tea had failed. A small dose of castor oil was ordered. The bowels were naturally evacuated, but an attack of almost intractable diarrhoea supervened, followed by a relapse of the fever. She had occasionally complained of pains in the abdomen, which pointed to the co-existence of an elevated intestine and constipation. During the relapse, she again had constipation. An emetina was substituted for the oil, and a single natural movement of the bowels was the satisfactory and sole effect. Since then I have used suppositories in preference to aperients.
Stimulants were administered in many cases, not as a matter of routine, but because as a rule, at some period of the disease, the vital powers began or threatened to show signs of exhaustion. In cases where the sounds of the heart became mumbled, and the pulse irregular or compressible, they undoubtedly did good, while in no case did they seem to act injuriously.

Antipyretics. One of the most general and patent symptoms in all symptomatic diseases is the marked elevation of temperature, and consequent increased cardiac and respiratory action. Since these diseases are universally denominated "Fever" though the fever is not the essence of the disease, but no doubt is an almost constant phenomenon of these diseases. Cases of what is termed "Fever, non febrile" do however rarely occur. Consequently, an antipyretic treatment, be it never so heroic, cannot be upheld as an example of one acting directly on the essential element in the disease - the fever itself. Indirectly, the reduction of
Temperature may weaken the activity of the person. Practitioners have not generally treated the temperature directly, beyond giving febrifuge mixtures, and hanging the body in cold water solutions.

Large doses of Arnitine, Digitalis, and Salicylate of Soda have been tried, but too much division of opinion as to their efficacy exists among those who have used them to encourage their extended use.

Baths have lately been much extolled, chiefly on the Continent, where they have largely been employed. Striking cases of their apparent efficacy in almost hopeless cases have been adduced, but many such cases have recovered by the usual treatment and careful nursing. Dr. Cooley strongly carries their use. They are said to be most beneficial, when used from the commencement of the fever. But they are said to do good, when used during the third week or even later. According to Brand of Lettin, and Leberechte, the grave nerve symptoms, such as delirium, stupor, etc., are due solely to the temperature.
"It lies in our power to prevent the temperature throughout the whole course of the disease from rising above a very moderate height, and hence we may obviate those ominous effects which are directly or indirectly caused by the febrile state as such. The great acceleration of the pulse and breathing, the fetid oppression and malaise, the dry from tongue, the thirst, the headache, the delirium, the stupor may all be counteracted. Nay, not only can we prevent the accession of these symptoms, but sometimes we can prevent them after they have supervened."

b) Under the Reaug-obath, higher temperatures than those are referred to.

At page 62 of the Corian Lectures he says: "In many of the Cases throughout, the temperature was abnormal, and in others never exceeded the normal point. The pulse was usually profuse; the more symptoms were of marked severity and were in inverse ratio to the temperature, consisting of violent delirium alternating with stupor. "The abnormal symptoms were slight, but the characteristic lesions were found in postmortem examination."
Cayley, however, is of opinion that hyperpyrexia minor is not a very important factor in their production. He, however, at page 91, says (vide opposite page) the following: 'Yet it is often that these symptoms occur when the pyrexia is slight or even absent, and are wanting when the temperature reaches great heights. Muchison mentions at page 356, under Relapsing fevers, that high temperatures in that disease “entail little or no change to the patient and do not produce serious cerebral symptoms.”

But on the other hand, Dr. Cayley gives the details of an Epidemic of Typhoid Fever, which broke out among the German troops during the siege of Paris. He, in the authority of Dr. Stodart, mentions the following peculiarities (vide opposite page). Then when the fever of temperature was wanting, and not only so, but the lower it fell, the deeper the delirium and stupor became. The question at once arises, Could the accessions of these symptoms have been prevented, by antipyretic treatment? Dr. Cayley however says that both have a twofold effect; they lessen temperature, and act as stimulants to the nerves, symptoms centres. It is
This factor is doubtless the virus or disease-germ.
not said whether in the cases mentioned by Chirche they were tried, but it is difficult to imagine that they could have acted beneficially. Although they might act as stimulants to the nervous system, they would also lower the temperature. But the lower the temperature fell naturally, the worse the delirium became. Would the same effects not have followed an artificial reduction? I have myself seen a patient, with a temperature of 104.4, not delirious, and yet be delirious with a lower temperature. I have also seen a patient, with a temperature sometimes of 104.6, have her intellect as unimpaired as when in health. This baths must be shown to have the small effect attributed to them by Dr. Couley before they can claim to be able to prevent such symptoms as delirium and stupor. A facts exists in Typhoid Fever which can cause them independently of the temperature. And it is uncertain whether baths, even if they do act as stimulants to the nerve centres, have any influence over this agency. And the treatment by baths is still in its trial.
Mr. Scale of Scarborough (B. M. Emmal. January 24, 1880) records cases of extra-ordinarily high temperatures, in which the patient recover'd did not at the time appear to be in imminent danger of dying. Dr. Conklin records a case in B. M. Journal December 20th, 1899, where temperature was 117. Mr. Scale says that these cases seem to establish the conclusion that these exceptionally high temperatures usually end in recovery.

Dr. B. M. Emmal. Nov 27, 1880.

In the B. M. Journal of December 4, 1880, two cases are recorded in which baths were employed. In the first they appear to check the upward rush of temperature & the delirium. In the other, the administration of the bath was followed by considerable perspiration, perspiration, and a speedy recovery (Dr. Os's cases).
Shifting results of this mode of treatment were obtained during the Franco-German war, showing a difference in mortality between the ordinary and antipyretic treatment of between 20 and 40 per cent for the former, and 30 to 40 per cent for the latter. Similar results have been obtained at the German Hospital. Douches must therefore be tried more extensively in this country, and yet practitioners will often be chary to have recourse to them, while the only indication for their use is a temperature exceeding 102° 2°F., especially until it is shown that they are not the cause of pathological phenomena, such as Dr. Burstone refers to. In two cases in which he employed them, he says he could not help attributing the fatal result to their use. The lungs in both cases were in a condition in which he never recollected to have seen them before in endemic fever.

Again a certain amount of movement is necessary in using baths, and this movement may possibly be the means of causing haemorrhage which otherwise might have not occurred.
Roman lectures page 84

vide pages 113 - 118. 02

vide Antwerp fever page 280 (Huchinson)

vide Cayley - pages 79 - 85
Further, relapses are said to be doubly frequent in cases antipyretically treated. It must therefore be taken into account whether it be more advantageous to allow the temperature exceed 102.2, or to persistently keep it reduced, at the risk of almost doubling the probabilities of a relapse.

But in certain cases the use of baths is avowedly contra-indicated. Dr. Carney says that when profuse intestinal haemorrhage, peritonitis, typhoons are coming in late in the disease, exist, baths should not be employed. Dr. Munchin holds that they should not be employed when the patient is aged, or when the extremities are cold.

Relapses, either with or without antipyretic remedies, are frequent occurrences in Typhoid Fever. They are said to be of two kinds: 1) true and false. In the true there is a fresh infection of the blood with the poison; in the false there is merely an increase of the local mischief. Errors of diet, mental emotion, and other extraneous circumstances may cause a false relapse, but Dr. Carney and Munchin are of opinion that a true relapse is never brought
Dr. Burnet, however, in his address gives one of the reasons why "Great Caution should be exercised" in allowing patients "give full play to their lust for food," that "relapses are not infrequent" during early convalescence.
by any of these causes. It is, however, frequently observed that a true relapse follows very closely some imprudence on the part of the patient or the friends. There is no disease in which the dietary rules are more apt to be infringed. Malt, and milk alone, is popularly regarded as starvation and additions to such fare are viewed, even by nurses, and as both justifiable and imperative. Further, errors of diet are more studiously concealed than any others, the medical attendant being often kept in complete ignorance as to their existence. Relapses do notoriously occur spontaneously, but so many are found to occur co-contemporaneously with dietary and other errors, that there is founded for at least the suspicion that the relapses are the natural effect, and not the mere accidental concomitant, of these imprudences. In several cases in which I believe there was a rigid adherence to the dietary rule, there were no relapses. In a case in which potatoes were eaten, a relapse instantly occurred. In a case already mentioned in which porridge was partaken of, hemorrhage
and a true relapse occurred, two days afterward.

A young man in the south of Scotland, convalescent from Typhoid, ate several under-ripe mangos. He immediately had severe diarrhea, a relapse super-
tened, from which he died.

Dr. Cayley is of opinion that the increased frequency of relapses after baths is due to the typhoid process not being completed. It is, therefore, conceivable that a rigid adherence to the primary methods of treatment may, in a less degree, check the typhoid process. The direct effects of an error of diet may be, then, to cause an increase of the local mischief i.e. a false relapse. The gastric and intestinal mucous membranes are irritated, and temporary pyrexia is set up. Nothing further occurs in these cases where the specific virus has exhausted or almost exhausted its special tabulae.

But, in cases, where, by means of the antipyretic, or the ordinary treatment rigidly observed, the typhoid process is not exhausted, this temporary fever, with its accompanying systemic derangement, may give rise to the conditions most favorable for a fresh
Armenian lectures - page 84.
infection of the blood with the poison, which being latent, is deposited in the mesenteric glands and glands of the ileum.\(^2\)

These are some of the many difficulties met with in the treatment—a treatment, when carefully followed, resulting in the recovery of over 80 per cent of the cases. But in England alone, 5000 people annually die of Typhoid. The prolonged strain of the "fevers among their course," slowly evacuates the patient, until at length the vital powers become exhausted. Can then the "course of fevers" not be stopped; the septic poison rendered innocuous; the cause, and not its effects, treated?

Sanitary Science has already done much to demonstrate the conditions which favor the propagation and contagiousness of the Typhoid poison. But these conditions not being, primarily outbreaks, preventable, Medical Science must "fear, adopting the germ theory of disease, destroy the contagia viria and thus cause all fevers to "aborted" in a true sense. Microscopic research has demonstrated the probability of each typhotic disease having its own disease germs.
Dr. Anstome says "Enteric Fever one of the many
other diseases for which as yet no specific is known
and for which I think no specific will ever be
discovered."
May there exist an antiseptic or septicide for each disease-germ, so far as all? Some authorities are of opinion that such a specific will never be discovered. But the success of surgical antiseptics may reasonably give rise to the expectation that some therapeutic agency, used internally, may act equally efficaciously. To attain this, it does not appear essential to detect, discover, or disease-germ. Immune acts as a specific in malarial fevers. It probably kills or removes the poison concerned in their production. But these miasmata have not, with any certainty, been discovered or demonstrated. In like manner, the germs of typhoid fevers may yet be destroyed by some equally antagonistic remedy, indiscoverable, though they may be believed to be.

Dr. Burnett, Edinburgh, has made use of the surgical antiseptic - Carbolic acid - in cases of Scarlet Fever. He administered it in the form of Sulpho-carbolute of Soda, and apparently with success. But the great difficulty is to use poisons antiseptics in such quantity, that they will kill the germs without dangerously affecting the living tissues and
functions. In surgical practice the germs are destroyed more easily, prevails to, than after, their deposition in the tissues. Hence the increased difficulty, when the germs are circulating in the blood, stored up in the glands, and multiplying in the intestinal lesions.

I have frequently seen satisfactory results, in cases of Diphtheria treated by the local application of Sulphurous Acid. It appeared to act like a specific, and if a suitable case of Typhoid were seen, that is, at an early stage, it might act likewise on the intestinal ulceration. Were a powerful and safe septicide discovered, an early diagnosis would be much desired, so that all exposed to the infecting influence might, by using the specific, anticipate the entrance of the germs into the system. Such a discovery would revolutionise therapeutic science; would enable it to combat successfully the essence of fever both typhoid and malarial, and thus annually save the lives of multitudes.

Improved Medical and Sanitary Science, then going hand in hand, would as minimise the ravages of Typhoid and the other fevers, as to cause
them in times to come to be as much scenes of the past as the plagues of mediaeval times have now happily become. Here, says an American physician, referring to this subject, is a field for the loftiest ambition and warmest philanthropy. Who shall be its successful occupants?

John Adams, M.D.

Thesis for graduation as M.D.