"Thesis on
Enteric Fever."

by

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Since first differentiated by the late Sir Wm. Jenner from Typhus Fever, perhaps no disease has been the subject of so much special inquiry and study as Enteric Fever.

Much certainly has been both said and written about this disease, but it presents features so numerous and so varied, and the consideration of these may be approached from so many different standpoints, that some excuse is, I think, left, for offering the following observations on the subject of Enteric Fever, — a disease very prevalent in the populous part of the West Riding of Yorkshire in which I have spent eight years in active practice.

I have throughout this treatise employed the name "Enteric" in preference to the synonym "typhoid" for it is better to use that name which has some significance, or special connection with the subject under discussion, rather than one which has been used to describe a group of symptoms occasionally occurring in Menigitis, Pneumonia and other diseases. "Enteric" points to an intestinal lesion, "typhoid" does not.
Enteric Fever (Febris enterica) — Synonym: typhoid fever. "Févre typhoïde" (French); "Abdominaltyphus" (German) — was for long confounded with typhus fever, and has been known by the names "gastro fever"; "low fever"; "slow fever"; "slow continued fever" and "infantile remittent fever", while the name "pyphoeic fever" was suggested by Dr. Marchion, but was probably never employed.

It is a continued fever due to a general infection by the bacillus typhosus (Charth bacillus) characterised,

1) Anatomically: by inflammation and subsequently ulceration of the Peyer's patches and solitary glands of the intestine — the lower part of the ileum being specially affected — by swelling of the mesentric glands and spleen.

2) Clinically: by fever, a rose-coloured eruption, abdominal tenderness and tympanism and generally diarrhoea.

Geography: — Although not confined to any special latitude, it is more prevalent in temperate climates (e.g. Great Britain, the continent of Europe, and the United States) than in tropical or extremely cold countries. It is found in Iceland, is frequent in Egypt and India, while the statement from the British Army Health Reports (BMJ Journal 1898 p. 578) that "high enteric death rates prevailed al-
Mauritius, South Africa, China, Ceylon and Malta", goes to prove that its distribution throughout the world is fairly universal. Reason: Most often occurs during the autumn months, and has been called "the autumnal fever", the greatest prevalence being in England in October, and in America in September (Whitelegg).

Sex: Oliver (3rd edition, p. 3) says "males and females are about equally liable to the disease". Brisbane (1887, p. 210) says "sex is without any influence over it". Whitelegg gives the preponderance to the males. Fagge (1891 edition, p. 168) says "of 415 patients at Guy's Hospital 242 were males and 143 females, but this is not a constant ratio". My own experience gives the males the majority in the ratio of almost two to one, and I have also found that the severity of the attack is greater in males.

Age: The age in my own cases has varied from 2 years to 59 years, and it is well recognised that the greatest susceptibility is between the ages of 15 and 25 or 30. It is generally held that infants under the age of 2 years are very rarely the subjects of tuberculous fever, and the gastro-intestinal disturbances so prevalent at that period of life are usually attributed to faulty feeding. I think, however, that if employed a little more frequently the Widal's
test (vive post) would reveal that many of those cases — as also some of those suffering from "summer diarrhoea" "worm-fever" and "consumption of the bowels" — are really cases of enteric fever, and the cause is to be found in the infected milk or water which has been used in mixing the child's food.

Causes: It was early recognized that insanitary surroundings — such as the presence of cess-pools, ash-pits, foul open drains and the like — played an important part in the causation of this disease, and these, along with over-crowding, want of personal cleanliness, and the breathing of sewer gas, constitute the chief predisposing causes of enteric fever; in fact, where such conditions prevail the disease is apt to be endemic. The narrow courts and alleys of large towns — from which sunlight is to a great extent excluded, in which there is no thorough circulation of air, and in which, very often, the arrangements for the disposal and removal of excreta and refuse are incomplete — are favourable situations for the development of, and the keeping active, the organism which is the cause of the disease. For many years it was held that faecal decomposition and fermentation constituted the actual cause of enteric fever, and this was the theory of Murchison who proposed to apply the name "pyogenic fever"
to the disease. At that time the presence of a specific micro-organism was not allowed, and although now generally accepted that bacillary dysentery has its own peculiar organism, a certain amount of difference of opinion still exists among bacteriologists as to the exact nature of this organism and the part it plays—as well as to the way it plays its part—but the doubts on this subject are daily growing less pronounced. It certainly seems more reasonable to attribute the cause to a specific micro-organism, rather than to a saprophytic poisoning, and in view of recent bacteriological discoveries and experiments in this and analogous diseases to assert that—though some links in the chain of evidence may be incomplete—the Cholera Bacillus is the cause of bacillary dysentery.

A controversy which has been carried on for years, centres round the Bacillus typhosus and the Bacillus coli communis. The Bacillus coli is found in the normal human intestine, and some observers are inclined to look upon it as merely a transition form of the Bacillus typhosus—for these bacilli are very similar in size and shape, and are characterised by similar terminal and lateral flagella. Others hold the opinion that these two are identical, and that under certain conditions, the non-pathogenic Bacillus coli becomes greatly
In virulence and becomes pathogenic.

In a "Report of the Epidemic of Typhoid Fever in Belfast, 1898" Drs. J.E. Smith and F. Tennant (Aug. 26th, 1899) give an account of a series of laboratory experiments which they conducted with the view of gaining further information as to the action of _B. coli_ and _B. Typhi_. They differentiate various "races" of _B. coli_ and _B. Typhi_ and attribute to these different races varying degrees of (a) pathogenicity and (b) power to produce blood reaction. They found (citations missing their paper)

(a) Syphilis of _B. coli_ and _B. Typhi_ increases their pathogenic power.

(b) If a culture of _B. coli_ be planted in gelatine in which a growth of _B. Typhi_ has been, it increases markedly in its virulence - and this is confirmed by Saccozelli whom they quote.

(c) The _B. Typhi_ when inoculated directly from the human spleen into guinea-pigs, possesses little or no virulence, an enormous dose being required to kill - and this is still more true if cultivated.

(d) Such inoculation is rendered much more active if the animal be previously inoculated with the products of metabolism of other _bacteria_ - and Saccozelli found _B. coli_ the most suitable of all for this latter purpose.
They also quote Chaudeure and Widal, who, though attributing a greater degree of virulence to the B. typhi obtained from the spleen, state without reservation that "some factor besides the typhoid bacillus is concerned in the production of bacillus fever," and Dr. Henry Martini (Erasmus lectures '98) says "these two organisms (i.e. B. coli and B. typhi) react on each other, one aiding infection by the other." However, the two organisms are different, and described (in "Vomiting, System of Medicine") tabulates no less than fourteen points of difference. Clinically the most important is that known as "Widal's serum reaction" or "Widal's test." Dr. Widal of Paris found that the blood or blood-serum of patients affected with bacillus fever acquired qualities antagonistic to the B. typhi, causing them to tube and cover glass cultures to run into clumps, and it is this "clumping" of the bacilli which constitutes the characteristic feature in Widal's test. Prof. Greenfield (notes of his lectures, 1897) characterizes this reaction as the most striking distinction between B. coli and B. typhi. I have not actually used this test myself, but have seen it demonstrated in Leeds, and there can be no doubt as to its value as a means of rapid and accurate diagnosis. Prof. Sheridan Dulwich concludes an account of this "sero-diagnosis of typhoid fever" in "Albudo..."
Such a discovery must be looked upon as one of the most remarkable practical applications of the science of bacteriology to the practice of medicine. And yet all bacteriologists are not satisfied. It seems to me that they do not all work from a common basis, and in the interests of science it is probably better that they should not do so. They seem to employ sera differing in strength and media differing in quality, and while one man may find a reaction with certain races, another man may fail to find the same reaction.

Dr. E.H. Durham, who has worked much and written extensively on this subject in a paper (Lancet 91:51-52) on "the serum diagnosis of typhoid" says he is "in decided as to the number of types of B. typhus to be recognized" and that "in diagnosis of bacilli by serum reactions it is necessary to have extremely potent samples of serum and to use minute quantities of them."

Dr. G.O. Smyth (Lancet 99:234, 1911) found B. coli, post-mortem in 50% of bodies examined, and asserts that the B. coli seems to have the power of distinguishing other forms which may have originally been present. He found the B. typhus in the spleen, 24 hours, but not more after death, and says "to ensure success cultures for B. typhus should be made as soon as
possible after death, preferably from the spleen." Until all these questions of race etc. are settled by bacteriologists, it will be impossible to say definitely what the results of all the investigations that are being carried on will be, and at present I am inclined to leave the discussion where it is, and to conclude this part of the subject with the words of the British Medical Journal leading article (March 15th '97) viz. "the weight of opinion among bacteriologists at this time is that the color group of organisms can be sharply differentiated from the typhoid bacilli."

The hindrance to the universal acceptance of the belief that the B. typhosus is the cause, and the sole cause of this disease is, that up to the present time it has not been possible to ful-

fill the third requirement of the pathological law, i.e. to produce the disease experimentally by the inoculation of animals from cultures. Then there is another point requiring con-

sideration. Some authors assert that the toxins produced by the introduction and action of the bacillus in the body play the more important part, and this brings up the question "Is enteric fever a general infection with an intestinal lesion?, or "Is it primarily an intestinal affection only?"

Dr. Louis Pasteur (Croom's lectures, Bng. '98)
in a series of elaborate experiments which he recounts, found that he could isolate from the vegetable kingdom, from the seeds of the castor-oil plant, and from the seeds of the Abrus Precatorius, a protoplasm ('ricin' in the one case and 'abrin' in the other)—which when introduced into pigeons or produced a blood-stained diarrhoea, great prostration and death, and he found p.m. inflammation of the mucous membrane of the intestine, especially of the adenoid patches— and he also found equally similar symptoms and p.m. necrosis produced by the closely allied organisms, the typhoid bacillus, the Gitternes bacillus, and the bacillus coli, and he 'has no doubt in all these cases the effect on the intestine occurs during the secretion of the poison by the mucous membrane in whatever way it may be introduced into the body'. He also says the poison has a selective action on the small intestine, an action which the typhoid bacillus shares with the two other organisms mentioned above, and with the vegetable products 'ricin' and 'abrin'. He is very strongly opposed to the belief that the disease is a general infection with an intestinal lesion and the black and flourt to whom he quotes, support him in this view. However, the fact that the distribution
of the bacillus is so general throughout the system — being found during illness in the intestine, mesenteric glands and spleen, in the typhoid spots (Osler) almost constantly in the urine (Wright & Temple) and in abscesses which have formed long after the fever has disappeared. It seems to be strongly in favour of the infection being a general one.

Samarelli (quoted by Smith & Tennant (V. supra)) thinks it "probable that auto-inoculation with products of intestinal fermentation is a factor in the causation of typhoid fever." There is still a good deal to be done experimentally on this disease and perhaps it is safer to affirm simply that enteric fever is due to the bacillus and its products. The bacillus leaves the body of an enteric patient in the feces and urine, although it was not until quite recently that attention was directed to this latter, and Dr. Wright & Temple maintain that even yet too little heed is given to the disinfection and careful disposal of the urine. I have often found it difficult to account for the cause of an attack of enteric occurring in a district from which it had been long absent, and medical men in general practice — on pronouncing a patient to be suffering from this disease — are nearly always asked the question "Where has
the infection come from?" and to answer this satisfactorily we must know something of the behaviour of the bacillus outside the body. All authorities are agreed that the bacillus typhosus has remarkable vitality, and that under favourable conditions it may retain this Vitality, and remain an active infecting agent from one year to another. It is uncertain whether or not it has the power of increase outside the body, but it is probable it does increase in the presence of suitable conditions of soil, moisture, and the presence of organic matter. Its chief nidus is in the soil, and in this it may be found at almost any depth, but it is in the few feet just above the level of the "ground-water", and in the "groundwater" itself that it is most prevalent and many interesting observations bearing on this point have been recorded. A connection has often been traced between movements of the ground-water and the rise and fall of the epidemic curve in zymotic charts.

In his country Dr. Monseur Lepesame (Lancet, 1896, p. 166) found that the fever curve increased with a rise of the ground-water, while Whitehead (Public Health, p. 307) quotes Birch of Munich as follow:

"the total of the cases of sickness and death from typhoid falls with the rise of the subsoil water, and rises with the fall of it."

In Munich, Berlin, Paris, Lyons, and Dublin which
have all been the subjects of careful observation.

Under this head, the difference in the configuration of the surrounding country, and differences in the nature of the soil and sub-soil, would no doubt account for different results obtained for Kirch found that "it is not the high or low level that is decisive but only the range of fluctuation".

Most often it is by a fall of the ground water that wells, and other water supplies, previously pure, become infected, and it is by means of infected water that the disease is most often spread.

Numerous indeed are the records of epidemics great and small, of "water-borne typhoids," and this constituted the subject of an inquiry by the British Medical Association a few years ago.

I have given (p. 69) an account of an epidemic which occurred in my own practice in the village of Accrington, and which is a very striking example of the specific pollution of a well, and the subsequent spread of disease, while recent epidemics at Lympne, Maidstone and Belfast (1917-1918) furnish undeniable proof of the very deadly results that may follow the drinking of such polluted water, and also show how a comparatively slight pollution may be followed by a very large and widely spread epidemic.

At Maidstone for example it was proved that the secretory from a gipsy camp, in which
was a man suffering from enteria, had obtained access to one of the main water supplies of the town, the result being that in two weeks 8-09 cases of enteric fever occurred, and in the end the total reached 1900 cases out of a population of 35,000 (Dec. 1895).

An outbreak at the village of Kriedwich in Yorkshire this year is one of the most clearly proven examples of water-borne typhoid I have seen. Here, the village population drank water supplied from Kriedwich Hall. For some time this water supply had been contaminated by water-closet spillings, but no ill effect in the district had resulted. The owner of Kriedwich Hall came home from London suffering from illness which proved to be enteric fever, and his stools were partially disinfected and emptied in the w.c. In a very short time 24 cases of enteric fever were notified in the village, and the number is still increasing (Feb. 99). A sample of the water examined showed "no evidence of contamination" — but 15 minutes after introducing an anaerobic dye into the drainage system of the Hall, its colour was detected in the water tank supplying the village.

In towns, but more frequently perhaps in country villages — the inhabitants may, for years have been drinking water polluted with fecal organic matter, and no enteric fever has arisen, but, let the same water become
fouled with excreta from an enteric patient and an epidemic is set up at once. I have proved this myself, and would like to emphasise the fact that in all these recent epidemics there has been a specific pollution of the water. Whitelegg (p.308) says "the virulence of the water-borne poison is not dependent upon the organic matter in the water but upon the specific pollution", but later seems to contradict himself by concluding (p.309) "upon the whole it is perhaps more reasonable to withhold judgment upon this point, and to affirm only that sewage-polluted water may convey enteric fever without the addition of the excreta of known cases of the disease". However, if it be not always possible in every case to demonstrate the presence of a specific pollution — and other say (p.44) — (Dr. E.H. Durham using almost the same words) "the detection of the typhoid bacillus in drinking water is by no means easy" — the weight of evidence is certainly in favour of its existence — in my opinion it cannot now be denied.

It can be readily understood that many surface-grown vegetables (e.g. celery, rhubarb) are liable to contamination from contact with the mansue, so often used for forcing their growth, collected from ash-pits and foyries, while watercress is also liable to contamination.

The infection of enteric fever is also frequently conveyed by milk. An epidemic occurred...
in Kirkcaldy in 1876, in which there were 191 cases and 20 deaths, and this was traced to a dairy, while I remember an outbreak in a certain district of Edinburgh where the infection was traced to a dairy farm some few miles from the city. In all probability in epidemics of "milker's typhoid" the infecting organisms are added to the milk by water used in washing milking cans, and although Whitelegg suggests the possibility of there being a bovine enteric fever, the infection of which is contained in the milk yielded by cows affected—this is nothing actually to prove this.

Oysters, cockles and mussels have also been found to contain the germs of enteric fever and may account for the source of infection in some sporadic cases. In the Lancet (1897, p. 637) is an account of an outbreak in a district of Liverpool, proved "in great measure to be due to mussels collected by children on the foreshore.

I have met with two cases in which I have strong reason for believing the source of infection to have been in oysters. (1) A boy (a.e. aged 17) had gone on August Bank Holiday to a "gala" in Bradford, and with a companion had partaken of some oysters. The companion became sick half an hour afterwards and vomited his oysters. He was not sick, but two weeks afterwards had to give up work, and went through an uncomplicated attack of enteric lasting 7 weeks, and there was no other enteric in the district.
(II) On Dec. 98, aged 45, went to Newmarket Races, and was then in perfect health. While there he, on two occasions, consumed tenea syrup which seemed to him "all right." Three weeks after his return he developed a rapid and severe attack of enteric which ended fatally. He was a careful diet, and the only article of diet of which he had postulated beyond his usual food, was the syrup.

It has been doubted whether or not the bacilli could be carried and the disease spread through the atmosphere, and although it is not likely to occur very often in this country, it is well recognized in India that the disease may be spread by the dust carried by the wind, and containing dried particles of lymphoid excrement - (Lancet 98 p. 160 - Dr. E. S. Synnott), and recent observations on the action of the bacillus after drying support this.

Contagion. Although nurses and medical men rarely get enteric fever from a case on which they may be attending, such are sometimes met with. It is probable that the germs get on to the nurses' hands while handling the patients' linen or bed-pan, and that the direct contact leads to a direct infection. Formerly, nurses were more careful about the isolation and nursing of enteric cases than formerly, for it has been found to spread, without doubt, by contagion, from one patient to others in the ward.

If, in addition to what has been stated above, it be added that there are in all probability
Other occasional sources of infection (including fish, the butter and meat) not yet thoroughly recognized, then there will be very few cases of enteric fever in which a specific infection by the typhoid bacillus cannot be traced.

**Modus Anamneta:** I have had few opportunities of studying the modus anamneta of this disease, but may mention what are recognised as its leading features. The Peyer's patches and solitary glands in the intestine become swollen and inflamed, the glands in the lower part of the ileum being specially affected. This inflammation may subside, but more often advances to a process of necrosis and sloughing, which results in ulceration. The mucous coat generally sloughs, and the submucous and muscular coats of the intestinal wall are exposed. The muscle layer, most frequently forming the floor of a "typical ulcer" and this ulceration is the most prominent and characteristic feature in the modus anamneta of the disease.

Perforation of the bowel occurs in 5 to 6% of cases of enteric, and it would be interesting to study "the actual process of perforation," but this can only be done satisfactorily in hospitals - not in general practice. The perforation may be due (1) to unusually deep ulceration; (2) it may be the result of extreme distension of a bowel whose wall is thinned and weakened by disease; (3) it may be due to the passage of hard masses of fecal matter or of partially digested food, which
rubbing against the diseased patches cause a too rapid separation of the slough, and a tearing of the floor underlying the slough.

The mucous glands—especially those in direct continuity with the affected part of the bowel become involved, being found to be swollen, but they rarely necrose or suppurate, and the retro-peritonoeal glands are similarly affected. The spleen is nearly always enlarged, while the liver also occasionally shows some degree of increase. I have several times been able to distinguish this enlargement of the liver by percussion, most noticeably in the case of J.R., aged 37, whose liver during a long attack of the disease was at one time 3 inches below the costal margin.

A process of a necrotic nature not infrequently attacks the larynx, and resulting ulcers are found while other occasional complications of the respiratory tract are Bronchitis, Pneumonia, Gangrene of the lung, Pleurisy and Empyema.

The heart muscle may undergo a degree of granular or fatty degeneration—while endo-carditis and peri-carditis are rarely met with. Typhoid bacilli have been found in the vegetations in endo-carditis.

(The above paragraphs are summarised chiefly from a copy of Prof. Greenfield's notes.)

Incubation: It is often somewhat difficult to fix with any degree of certainty, the number of days of incubation. It is generally stated to be from 7 to 14 days or up to 21 days.
I have found it most usually 10 or 14 days, but have met with cases in which I have been inclined to compute it at more than 21 days even. The disease does not, however, attack all patients with the same degree of severity, and it may be that part of the period of advance has sometimes been counted as part of the incubation period.

Symptoms: It is not often that a medical man in general practice finds a fully developed typical attack of enteric or passing a first visit to a patient commencing with that disease. In fact, very often, the patient comes to the doctor's surgery complaining of a feeling of "weariness," and "unfitness for work," loss of appetite, increased thirst, giddiness, or slight headache, and sometimes "shiverings." These symptoms, on inquiry, may have been present for a few days, and the temperature is taken perhaps 1 or 2 degrees of increase are recorded. The pulse may not be quickened, and the face may be pale than usual, though it is sometimes flushed. I have sometimes, even at this stage, noticed the expression of the eyes which is most pronounced during the second and third weeks of the attack. "A gentle, dreamy, "far away," kind of look." I remember a young police constable (West Riding Constabulary) who had only been "passed" by the staff-surgeon twelve days before coming into my surgery and sitting down, in whom, at a glance, I diagnosed enteric fever from his general appearance and expression. The man looked ill.
With cheeks flushed, lips dry, eyes bright and weary, looking, and temperature (when taken) of 102°, and he went through a severe attack of enterica. I do not mean to imply that one can often spot enteric fever as in this case, but frequently even in the early stage the presence of the disease is suggested by this expression of languor. I have found, in the great majority of my cases that the onset of the disease was gradual, in fact it has sometimes been difficult to say when illness actually commenced. I have found that a man may be in failing health—suffering from an apparent progressive weakness—only for two or three weeks before being actually a pronounced case of enterica, and have notes of two such cases:—

(1) T. C., aged 53, shaftsman, a very powerful man, in the habit of working for 16 or 18 hours a day, for days together, complained of tiredness and weakness for 6 weeks before ceasing to work. He then developed a rapid attack of enterica which proved fatal from haemorrhage on the 15th day.

(2) J. B., 34, farmer, was treated for anæmia and sciatica for 6 or 7 weeks during the summer of 1898, at a time when he was working very hard in harvesting operations. At the end of that time he had to take to his bed as his temperature began to rise, and the weakness increasing and he turned out to be a very serious case of enterica. In both of these cases either (a) the disease had been unusually long in its periods of incubation and advance, or (b) the general tone of both patients had been so much reduced by a period of over-work that
they were rendered very unfit to withstand the attack of the bacillus typhosus. I think the latter is the more probable explanation, as I have repeatedly found acute febrile attacks on adults who are run down from overwork. A sudden onset of the disease,—that is when an undoubted attack is recognised in from 3 to 5 days,—I have found to occur nearly always in children or young adults. In four of my cases the disease was pronounced in less than a week, and the ages were 4, 13, 21 and 23, but such as these may sometimes be explained by the impression that at that period of life medical advice is not readily sought for simply "feeling out of sorts," and the first week, perhaps, of illness may be overlooked. However, in all cases, whether of sudden, or of gradual, onset, there comes a time when the patient can no longer walk about but is compelled to go to bed, and it is generally from this time that the duration of the attack is counted and the records of the illness are kept.

If a systematic examination of the patient is now made it is found: (a) that the pulse is quickened, ranging from 85 to 100, soft in character, and sometimes diastolic; (b) the temperature will be 101° or 102° F., and is higher than would be expected considering the rate of the pulse, and this "pulse-temperature ratio" is often important in cases where the diagnosis is doubtful (like first) (c) the patient most often lies on his back, and does not move about much; (d) his worn-out expression is very evident and a hectic flush
suggesting phthisis may be present on one or both cheeks. (1) his nose may bleed from flushing of the mucous membrane. (2) the tongue is coated with a whitish-yellow fur, the tips and sides as a rule remaining clean and even at this stage (first week) may be very dry. In my opinion the state of the tongue is often an index to the severity of the attack - the drier and browner the tongue the worse the case proving to be. (3) The appetite is diminished, and is probably quite wanting, the patient only expressing a desire for "something to drink." (4) the condition of the bowels is very variable, as either constipation or diarrhea may be present, while an alternation or between the two is not infrequent. I have known at this stage a patient complain of a "feeling of heat in the bowels," another of a sensation of "extreme cold in the body," while "unrest, rumblings," and "sticking pains" have also been used to describe to me the unusual abdominal sensations. (5) A certain degree of abdominal distension may be made out, but this is rarely pronounced until later in the course of the disease. (6) a troublesome cough is sometimes present due to bronchial catarrh - (the pneumonia which is sometimes found ushering in an attack of phthisis is spoken of later - p. 35.)

On inspecting the chart of the illness, (and a general practitioner adds greatly to the case and accuracy of his work by keeping proper chart records of all his Feverish or acute cases) - it may be noticed how regular is the rise of the temperature, each successive day giving
an increase. In the majority of cases the evening temperature is higher than that of the morning by 1 or 1/2 degrees, and the so called "typical typhoid chart" is the result, but on looking through my own charts I find some departures from this — e.g. in W.M. aged 38 (chart p. 44), the temperature was always highest at 3 p.m., a full degree higher than at any other time of the day — in case of J.W. aged 14, the temperature does not vary one degree from the time his illness first began (103°) until convalescence, by which is established after an illness of four weeks.

Second week: The illness continues and we now notice the few scattered, rose coloured, lenticular spots which appear on the abdomen, and lower part of the chest, constitute the rash of this fever. These spots are present in nearly all cases of enterica, and taken in conjunction with the other symptoms fix the diagnosis, but it must be remembered that they are generally only few in number, — from 3 to 15 or 20 — and often have to be looked for. They are isolated at some little distance from each other on the skin of the abdomen, lower part of the chest, and sometimes on the back and flanks. — They disappear on pressure. Each spot remains for about 3 days, and by marking their situation with a ring of India ink it can be proved that several successive crops occur. They are generally flat spots, raised slightly above the skin level, but sometimes they become vesicular in character. They are fairly typical in appearance, and, by any one well
acquainted with them, can easily be distinguished from the "flex-bite", "ordinary pimples", and "shots" which have been there for "years", which are apt to be assigned—(especially by patients)—as the cause of the rash. The copiousness of the rash is no index of the severity of the fever; a very severe attack of illness being sometimes accompanied by only slight rash, and vice versa. It is not present in every case of enteric fever. Bristowe says (1870 edition) "shots are absent in ¼ of the cases;"—Blaauw (Dictionary of Medicine 1894 edition) says they are absent in about 30 per cent, and I doubt if the proportion is as large as this, and am of opinion that where shots are small and few they are apt to be overlooked. Elder says simply "the rash is not always present", while Paget (Practice of Medicine 1871 edition) "doubts if it is ever really absent", and there is a concensus of opinion among all these writers that it is more frequently in children than in adults, that the rash is wanting. There may be little alteration in the patient's general condition—his mind being, for the most part, clear in spite of a temperature perhaps reaching 104°; the pulse will be slightly faster than during the first week. The bowels will now probably be moved from 3 to 6 times a day, or even oftener—and the motions will have assumed the "sea-soup" appearance and consistence which is so intimately associated with this disease, and it is important for the medical attendant to inspect them frequently himself, and not be satisfied with a nurse's or relations' description only. I have had two
Cases in which, though diarrhoea was present, the movement of the bowels was accompanied by an intense burning pain at the anus, and in both a large oesophageal mass was found which could only be removed by breaking up at repeated attempts with the finger.

Oster says, "diarrhoea is found in 25-30%". Brissorne says it is "rarely absent". Fagge agrees with Dr. Murchison in placing the number at about 30%, and certainly in this district the large majority have diarrhoea, and is have 2 or 3 - or more - loose motions daily. I have had several cases in which constipation has been both pronounced and troublesome, but such are the exceptions.

The spleen will now be distinctly enlarged, and the palpable distension and general tenderness of the abdomen is more manifest than during the first week.

The symptom of "gurgling in the right clavicular fossa" which is so commonly described and so universally looked for should, I think, not be insisted upon. It seems to me to be quite wrong both in theory and practice to assert any pressure over the region where the gut is in a condition of disease and distension, with the view of eliciting this gurgling, which is, after all, a symptom of little clinical value, as it is found in probably 8 out of 10 people lying in bed who have no enteric fever at all.

Third week: as the time goes on and the third week of the fever is in progress the patient begins to show the effects of the continued pyrexia and diarrhoea. He is much weaker in every way.
and may be quite apathetic. The pulse is faster, 100 to 120, and correspondingly weaker; sleeplessness increases and there may be a decided tendency towards delirium; the abdominal tenderness may be so great that the weight of the bed clothes can hardly be borne; it is at this point that the grave complications of severe haemorrhage, perforation of the intestine, and peritonitis are most likely to become manifest.

Little more need be said in the way of description of an uncomplicated and recovering case. The temperature begins to get lower, and continues to do so by regular stages, sleeplessness disappears, and appetite and strength return, sometimes quite rapidly. In severe cases, not necessarily proving fatal, the temperature remains high (104°-105°), the bowels move 6 or 8 times daily, the stools perhaps containing a certain amount of blood; urine, dark and concentrated, may be passed unconsciously; bedsores tend to develop; sores appear on the lips, gums, and teeth; the tongue is brown, or yellowish-brown, and "baked," and the patient lies in a semi-comatose condition only kept alive by the constant attention he receives. In such cases the duration of the illness is much prolonged, and it may be 5 or 6 weeks before there is a decided remission of temperature, while on account of the extreme degree of resulting emaciation and debility the convalescent stage is also likely to be long. 

Death in septic fever may occur at almost
any period, but is more frequent during the later stages of the disease.

I have had two cases in which the onset of the attack was sudden, where the temperature within 5 days had attained a height of 104° and where death resulted in one case in 10 days, and in the other in 12 days. In both the temperature and all concurrent symptoms, including severe diarrhoea, advanced with marked rapidity and intensity, the patients never seeming to be able to make even any show of resistance. At a later date death may result from:

1. Cardiac failure, due to asthenia, occurring after 4 or 5 weeks of illness.

2. Intestinal haemorrhage. (3) Perforation+peritonitis.

4. Other complications - the most common of which is pneumonia.

Of all these causes of death, asthenia and cardiac failure is the most common. In such cases, the fever goes dragging on for 4, 5, or even 6 weeks, the pulse becomes daily weaker, and irregular, and the patient for a day or two before death lies in a condition of coma! - or an active muttering delirium accompanied by great restlessness may replace the stupor, and I have found this latter condition nearly always in men - especially if middle-aged - who may have been 'free-lancers', and among brewer workers and alcoholics generally. These last - as in pneumonia - have hardly the ghost of a chance of recovery in intense fever.
Haemorrhage: occurs in from 3 to 7% of the cases former fatal. I have had 4 cases in which haemorrhage took place and 3 of these died. It does not occur before the end of the second week of fever and varies from a slight staining of the motions to a profuse discharge of pure blood. The occurrence of a certain amount of soiling from sections of the intensely congested bowel will often account for the blood, generally of a brick-red colour, which is found lying on the top of the motions, while the larger discharges of dark and often clotted blood can only be due to the erosion of blood vessels by the ulcerative process of the disease. The discharge of blood in any considerable amount is nearly always preceded by a sudden fall of temperature and sometimes by a rigour. This was specially evident in the case of F.O. recorded in full (p. 64). In two other cases I found severe haemorrhage preceded by a rigour, and I think that sufficient importance is not attached by many writers to the indication thus given. The blood may not be expelled immediately from the bowel as it can be easily understood that some little time must elapse for its passage from its point of origin in the small intestine or upper part of the colon to the anus.

Although a symptom of considerable gravity haemorrhage does not always prove fatal, and some of the older writers — notably Trouseau, as
quoted by Jagg - even contended that it was a symptom to be construed in a patient's favour, although how they came to make this out is difficult to understand. In a disease so varied in its aspects it is not possible to place all cases on the same level, but other things being equal, any case in which haemorrhage occurs must be more dangerous than one in which it does not occur, for in the former the intestinal lesion - the ulceration - is more severe, and the risk of a fetal termination from this haemorrhage, or from perforation is more palpable. When present, it occurs in the majority of cases as a natural sequel to the ulceration, and signifies, I think, a certain degree of separation of the thong, and I have found slight haemorrhage increased to a grave degree by the administration by relatives of "forbidden fruit". In one of my fatal cases the haemorrhage was increased tenfold by the swallowing of a few grapes given on two occasions in the temporary absence of the Framed Nurse, the seeds and skins of several grapes being passed, unchanged, with about 4, and later 6, ounces of almost pure blood. I formed the opinion at that time that the seeds and skins passing along the gut had rubbed off, or pulled off, some through which if undisturbed moved probably have separated more gradually and with less bleeding.

Alder (98 edition p.25) says "Intestinal haemorrhage may be the indication of a general haemorrhage"
tendency, in which case it may be associated with
haematuria" - and no doubt this
is so, but I have not had any such case.
Perforation occurs in 2-3% (Pelte) - in 3-5% (Tagge) and is the cause of death in 30% of the
fatal cases (Tagge). I have had only one case in which
in which I diagnosed perforation, and it proved fatal
in about 16 hours: - a grocer, aged 23, was in his
first week of illness and had every appearance of making
a good recovery. He was longill for solid food which
up to then had been witheld, but some friends coming
to visit him persuaded him to partake of some roast
pork and potatoes they were having for dinner, plus half
a glass of porter. About an hour afterwards he began
to feel very ill, and "wanted to vomit", but could not.
I was sent for some four hours afterwards, and found
him pale and deathly looking, with weak, fast pulse
and hurried respiration; temperature 99.5°, while his
abdomen which had been free from tenderness and
distension for some days, was now both markedly
tender and tympanitic, the least touch with the
fingers causing him considerable pain. One had only
to look at his face and his attitude in bed to diagnose
acute peritonitis, the result of perforation, and he
died in 16 hours.
Perforation is due to the ulceration in the first
place, and may be excited by the passage along the
bowel of masses of semi-solid and undigested food,
(as in the above case) or of hard fecal masses, or i-
may occur simply as the result of deep ulceration and
complete or partial separation of a correspondingly deep
slough; while many cases seem to have as an exciting
cause the exertion of a sudden or undue pressure
upon the bowel, such as a heavy cough, straining at
stool, or distension with flatus. It occurs most
often in the 3rd, 4th or 5th week of the fever, (i.e. the
time when ulceration is in progress or advanced,) but
other records it as being found "as late as the
4th month, and as early as the first week," as
regards the occurrence of perforation in the first
week. I am inclined to think that the difficulty
of fixing a date for the beginning of disease might
account for this, and that in such a case the patient
had probably been ill more than seven days.

The symptoms of this very grave complication are those
of collapse and peritonitis, and they may come on
without any special reference to the rest of the
symptoms - in other words - perforation is found
not only in severe attacks of enterica, but often
enough in quite mild cases, while it is also said
that patients have been found suffering from
perforation of an enteric ulcer who had made
no previous complaint of illness at all.

Recovery is rare, but is recorded as having
taken place by the formation of adhesions, or by
"the formation of a circumscibed abscess" (Taffo) -
and more recently, as the result of surgical procedure.

(Kemeny in Brit. Med. Jour. 25. '99)
Prolonged Convalescence. The average duration of an attack is 6-8 weeks, but not infrequently cases are met with in which the temperature remains 1 or 2 degrees above normal for several weeks beyond this average time — (and) do not under this head include prolongation due to true relapse, or any marked complication such as encephalitis, thrombosis &c. — the patient seeming to be at a standstill, gaining neither strength nor weight, and having probably no sign of illness beyond the increase of temperature. The most usual cause of this is, in my opinion, pure downright weakness. The enfeebling effects of even 3 or 4 days of fevers, such as may be met with frequently in influenza, for example — are very pronounced in some people, and in influenza the vitality of some individuals is so much reduced by a period of 3 or 4 weeks illness that they seem to have no power of record left — they cannot throw off the effects of illness. Or, something in the patient's surroundings may be at fault — his room may be undersized, badly lit, or badly ventilated — or it may be near or over some W.C., or drain in which the connections are defective. 

Or, a too strict observance of the usual dietary rule — diet may be the cause, part of the large quantity of raw milk which the patient is now probably consuming lying in the intestine indigested and decomposing.
Sometimes an ours anxiety on the patient's part to get well, seems ni neurotics to keep up the temperature as I found out myself in a case I saw with a neighbouring practitioner last summer: - F.B. aged 37 farmer suffered from an attack of enteric of average severity. At no time had he been in evident danger; he had had no haemorrhage or complication of any kind. Harvest time was coming on, and he was anxious to be about his farm, and of course as he had been told that he could not get up "until his temperature was normal," he daily inquired from his doctor "what is it today?" The doctor's visit was generally paid in the evening because it had been found that the morning temperature was practically normal, while the evening temperature always showed about 15° of increase. I saw him just after he had been 6 weeks in bed, and he was then on milk and beef tea and only, and was drinking daily about 3 quarts of rich, new milk. Thinking that the milk might have something to do with the continued rise - (though his motions did not indicate this) - he was ordered to take more beef tea, also mutton broth, boiled chicken, bread, butter, and to dilute his milk with barley water, while 5 grs. of salve were to be given thrice daily in addition to a mixture containing: Portmolt, E. P. A. Hydro. Phos. Chlor., and Ess. Menth. PIP. At the end of two weeks he was no better, every evening bringing it to 15° of heightened temperature. I advised that the same
treatment be continued for another week, with the
addition to his diet of scalf and raw beef, brown bread,
and strawberries. Still the temperature remained above
normal and I saw him again until 3rd. Finding,
after a careful examination that he was perfectly
sound, it was concluded that the lying in bed chasing
about his fowls and his peck or. which he could not see,
together with his married anxiety about the results of
the insertion of the thermometer, that was responsible
for the whole condition. It was then agreed to
"throw physic to the dogs", to give him any food he liked,
with scalf and raw beef, and to let him get up, and go and
sit, or lie, on a couch in his orchard in the sunshine,
and not to take his temperature for a week. He
improved in healthy appearance rapidly, and the
thermometer was only once again, chronically an
increase, and this man I believe, truly worked himself
into a state of health being all day anticipating
the doctor's coming next with the thermometer.

**Sung Complications in Enteric Fever**

1. *Pneumonia:* may be met with (a) early or (b) late,
in the course of an attack.
2. Sometimes an attack of enteric is ushered in
by Lobar pneumonia. I have had 3 cases, all adults,
in whom this condition was present; all were
middle-aged males, two being active business men
and one a retired merchant. The cases were very
similar in their clinical history, and one may be
described as a type of the others, and as illustrative
of the condition under which this complication is
off to arise: - G.A. - aged 35. - Tindall merchant,
had not been well for a few days, but had gone from
Wakefield to London on important business occupying two
days. On his way home he felt very ill in the train,
having severe headache and a feeling of chill, and
when he got to his home that night his temperature was
103°, and pulse 104, and he had quite the appearance
associated with Commencing pneumonia. For five
days his temperature exceeded 104°, while the large amount
of blood-stained sputum which he coughed up was ample
evidence of the severity of the lung lesion. On the 6th
day his temperature was 103°, next day 101°, and the
respiration was easier, but the patient's general
condition showed no improvement, in fact he was
weaker, almost than one would have expected, and
was dull and listless, while the bowels were frequent
in their action, moving 3 or 4 times daily. Distinct
typhoid spots were noticed on the 11th day of illness,
and the patient lapsed rather rapidly into a
typhoid condition, and died suddenly during the
14th night, the preceding evening temperature having
been 105.6

Many writers now that this initial pneumonia is
due to a direct attack of the typhoid bacillus upon the
lung, and have applied the name "pneumo-typhoid" to
such cases, but I cannot find any account of
bacterial evidence in support of this - but I have
seen it quoted somewhere, that the presence of the
Pneumococcus of typhoid could be demonstrated in nearly all cases of pneumonia occurring in enteric fever. No doubt both organisms may be present in the system at the same time, and I think the explanation of such cases is simply this: the incubation period of enteric is fairly long; in pneumonia it is very short. A man in whom enteric may be in a stage of incubation or invasion, is already in a state of lowered vitality, and his power of resistance against the attack of other organisms is diminished: in fact, the insidious undermining of health by the enteric bacillus renders a patient a fair subject for the reception, growth and development of the pneumaticoccus.

The incidence of pneumonia at the beginning of an attack of enteric is a grave handicap, and the majority of such cases prove fatal. All three of my cases ended in death, but the additional fact that in each case the age was over 50 also militated against recovery.

Leukocyte congestion is frequently met with towards the end of an attack, and is induced by the recumbent position of the patient, and the weakened action of the heart whose muscular fibre is flabby. This, though retarding convalescence, rarely proves fatal.

Pleurisy, as a complication is found in about 8%, (80%) and not infrequently empyema or pnuemo-thorax may follow. In the Lancet (1896, p. 488) are recorded two cases of pnuemo-thorax in enteric fever excited by straining at stool and in both empyema was present. This enteric pleurisy may occur early in the disease (cf. pneumonia) but more often, especially when the
effusion is purulent it develops towards the end of an attack or even during convalescence. I had one case of empyema in a boy of 11, in my Acton affair epidemic, in which incision and drainage produced a complete cure, the amount of pus removed being estimated at 21 ounces. It is said that these pleurisy and empyemas are due to the direct action of the bacillus upon the pleural membrane, but it seems difficult to decide why pus should have formed in some cases and not in others, and in all probability the infection of some other organism is superadded to that of the this bacillus.

Nervous System. Other describes a "cerebro spinal" form in which from the outset the disease is associated with "headache, photophobia, retraction of the neck, marked twitchings, rigidity, and then convulsions," but do not find this noted by others. Witness on the subject, neither have I met with any such, as another cause accounted, I think, for the head symptoms narrated in case of 160. (Vide p. 64.)

Delirium, in advance, may be present (1) in only slight degree, as indicated by occasional "wandering" in speech and restlessness in movements; or (2) it may be profound, the patient lying in a practically unconscious condition constantly muttering, and betraying those involuntary twitchings movements of the hands, fingers, etc. (subcutaneous tenderness) which are so well recognized as indications of great danger. Between these extremes (1 & 2) varies intermediate
degrees of delirium may be met with.

In men who have been drinkers, the nervous symptoms are always pronounced, genuine delirium tremens with hallucinations being often present.

Urinary system. The bacillus typhii is found in the urine in the large majority of patients, as has been proved by many writers prominent among whom are Prof. A.E. Wright of Netley, and his colleague Dr. Temple. They assert that infection is more frequently spread by urine than by feces and in a paper in the Lancet (1895, Vol. 5, p. 196) they say that in 6 out of every 12 of the bacilli are found. The B.M.J. (1895 p. 1575) quotes Retnamos who found "enormous quantities" of the bacilli in the urine in three cases quite late in the disease, being "persistently present in one case for two months, in another for one month, and in another for eight days." The same authority also relates how a nurse accidentally drank from a glass a small amount of the urine of a typhoid patient, and after twelve days she developed typhoid fever.

Albureum, due to the appearance of leucocytes, is frequently found in the urine in this, as in many other fevers. I have not met with any case in which this urinary complication has proved troublesome — or in which the disease has assumed the "repto-typhoid" form, occasionally described by continental writers, and quoted from time to time in the epitome of the B.M.J. In this latter class of case the disease is similar to an ordinary attack of acute nephritis and the usual abdominal symptoms may be
entirely absent, but the presence of antero-spot, and Widal's reaction serves to make plain the true nature of the case. It is important to recognize them - more with the view of preventing the spread of infection than with the idea that any treatment differing from that of ordinary acute nephritis is necessary.

The aries reaction of Ehrlich - a urinary test described in most text books - which was advanced by its discoverer as a certain means of recognizing antero has now been proved to be "presumptive evidence only of typhoid" (B.M.J. 1898 p.) as it is found "not infrequently in scarlet fever, measles, and other febrile conditions" (B.M.J.) while bitter (p.31) adds military tuberculosis.

**Differential Diagnosis**: from E. Acute tuberculosis

Including acute pulmonary tuberculosis.

It is sometimes difficult to pronounce between these two diseases, but the following considerations will help us: (a) there may be a family history of tuberculosis, but this is not important. (b) In tuberculosis there are greater daily fluctuations of temperature, and this is important. In most cases of antero the difference between morning and evening temperature, as well as the progressive increase, are fairly regular, but in tuberculosis the temperature in the evening may be 104° and yet be normal or sub-normal in the morning - while the opposite may also occur, the temperature being higher in the mornings than in the evenings. (c) the pulse, in tuberculosis, will be considerably
faster than in encephalitis. (d) The "pulse-temperature ratio" of the two diseases is quite different, for a temperature of 104° in tubercle will be accompanied by a much faster pulse than would be present in an ordinary case of encephalitis with the same temperature, and I think this is the consideration which helps us most in deciding those cases in which the symptoms and physical signs are not sufficiently distinct to make the nature of the disease quite clear. I have quoted (p. 68) the history of the illness of Mrs. D., which has a bearing upon this part of the subject.

From Typhus fever. This, so long looked upon as identical with encephalitis, is now not very common in Great Britain, The more sudden onset, the more rapid development of jaundice and prostration, and the rash, roseolous and petechial in typhus—will serve to distinguish the two.

From Meningitis: (including tubercular meningitis) a headache is sure to be present here (b) in tubercular meningitis there may be other evidence of tuberculous disease. (c) the pulse, in meningitis, is more likely to be slow and irregular, and may vary in character from day to day. (d) the temperature will be more irregular in its alternations, in meningitis (e) the mental faculties become dull more quickly, and if the meningitis be tuberculous, convulsions will probably be present.

It is indeed sometimes difficult to decide between enteric fever and meningitis—especially if we are not called to see the patient early in the course of the illness, and in doubtful cases, in making a diagnosis, the whole
history of the patient's previous state of health, the mode
of onset of the illness, the presence or absence of probable
sources of infection, should all be considered in addition
to these points noted previously.

Peritonitis and tubercular peritonitis are sometimes in-
cluded as giving rise to a certain amount of difficulty
in diagnosis, but I have not met with any such case—
although I lived for a time in doubt as to the exact
nature of three cases of abdominal disease, which
all occurred in young lads. The symptoms coming
on rather suddenly were abdominal pain, chiefly in
the right iliac region, but extending all over the
abdomen, feverish tongue, frequent liquid and foul-smelling
motions, temperature of 101° or 102°—in fact quite
resembling an attack of enteritis with rapid advance.
One on inquiry was found to have partaken of a large
quantity of raw peas a day or two previously, and a dose
of castor oil which was taken cleared all these away
some in a state of only partial digestion and recovery
quickly followed:—while the other two were I think
cases of colitis or enterocolitis.

In all such cases I think a careful weighing of the
whole history to. of the illness will enable us to make
a correct diagnosis.

Aque, molasses, and pneumatic soft drinks are also in-
cluded by some writers as requiring discrimination from
enteritis, but the two former are quite rare in this
country—and the last I have not met with in my
own practice.
Relapse in Early Years: occurs in 3.7% (Alburt) — in 11% (Rye-trust) while others say "the frequency of this condition varies from 3 to 15% in different epidemics and different places." In only 3 out of our 50 cases have I found a true relapse — that is in which there was a distinct interval between the disappearance of the remitting attack and the occurrence of the relapse. One was a case of double relapse (vide chart p. 44). There is usually, but not always, an interval of a few days of normal temperature before the incidence of relapse. It may be found towards the end of 4 or 5 weeks of illness that a patient's temperature shows a tendency to return to the normal, and at the same time there is such distinct improvement in all the symptoms that one is inclined to think — and perhaps to say — that convalescence will be established without any further trouble, but — and it frequently happens without any evident cause — instead of this the temperature begins to rise again and the patient slips back into the same kind of condition as when he was in the thick of his initial attack. In such a case the rash again appears within 3 or 4 more days, diarrhoea returns, and the nervous and other symptoms are even more pronounced perhaps than they were before. The interval after which this may occur is generally about 7 or 8 days, but varies from 5 days (Irvine), 10 days (Ivani), 11 days (Murchison) to 42 days (Other) — but such an interval as this last is, of course, quite exceptional. In my own cases the interval was 7 days in each, though in the case
of double relapse the second interval was 9 days.

It is all probability relapse is a real return of the disease, but it is often found to be excited by a return to solid food, or by the over-excitement of getting up, or of reading or talking too much.

Post mortems in hospitals prove that there is a return of the characteristic intestinal lesion, but whether the infection is spread from actual contact or contiguity with diseased sloughs or (2) by a reinfection of the blood by absorption from the diseased bowel, is not yet decided.

Other quotes (p.) an ingenious theory of relapse: "that reinfection may be associated with the persistence of bacilli in the bile-passages, and an indiscretion in diet may cause their discharge into the intestine."

The case in which I had a double relapse was that of a medical man (aged 30) of not very robust constitution, he had a most severe attack of the disease, lasting three weeks accompanied by haemorrhage and great prostration.

His temperature reached the normal, and remained sub-normal for 6 days. In the seventh day he had a slight rigor, and began to feel ill again and in the evening his temperature had reached 101, and with the exception that he had no haemorrhage the chief features of the relapse were the same as in the initial attack. He had been so ill that no one beyond the nurses and medical attendant had been allowed into his room during the last two weeks of the fever but after his few good days (i.e. during the interval) friends were admitted, and I think the emotion and excitement of talking
to them, and the partaking of one meal of minced chicken and bread, were the cause of his relapse. - Probably the diet was the actual cause. He was quite well for 9 days, and had another relapse which lasted 6 days.

Prognosis: As soon as a diagnosis of enteric is made it is well to warn the patient relatives in all cases that the disease is one which is beset with many dangers and difficulties, and although it is possible from day to day to say whether a patient is doing well or badly, it is not wise to desist from giving a most guarded prognosis until the invalid is actually out again. The more one sees of this disease the more firmly does the fact impress itself, that it is never safe to prophesy. I have tried it several times and have proved wrong - (as no doubt have other young practitioners), - Cases which were condemned as certain deaths, recovering, and death taking place in apparently mild cases in which there seemed to be no cause for anxiety. I have seen patients lie in an absolutely comatose state for two or three days in the height of a severe attack, with flagging pulse which seemed to point to a speedy dissolution, yet get well; while a case of sudden death from perforation during convalescence, and an almost equally sudden death from Carcinæ embarrassment from melena in a man who seemed to be recovering, enforced upon me the fact that it was not safe to assume the prophet's mantle. The general practitioner finds this
one of the most trying diseases he has to deal with — as he is oft to be badgered with questions and suggestions from relatives who are naturally anxious — and I have found that it is for the patient’s good where the nursing has to be left to friends alone to give a more than grave prognosis — in short I think it is justifiable, in this disease, to exaggerate the danger. However, one or two facts which should always be borne in mind when considering the probable sequel of any attack are:

1) Age: in children, the prognosis is favourable; in young people generally, if the constitution is sound to begin with, and they are put to bed and treated early in the course of the attack, the prognosis is also favourable, but a great deal will depend as noted above on the strict observance by the nurses of all the points of treatment laid down by the medical attendant. The older the patient, the greater the danger.

2) It is well recognised that for attendants — in this, as in other acute diseases like pneumonia, small pox, scarlet fever and the like — the prognosis is bad — and of course nearly all these will be affected by the age.

3) The condition of the pulse must also be considered. I have said previously that the pulse is not fast for a few and so long as it remains regular and not too fast (i.e. not exceeding 100 at most) he must not be alarmed at a temperature of 103° or 104° lasting for 10 or 12 days. But if the pulse in an adult gets faster than this and especially if it becomes small, easily compressible and intermittent, the danger is great.
(4) Marked affection of the nervous system is dangerous - the presence of coma, or muttering delirium (coma vigile) being especially dangerous signs.

(5) The severity of distention, haemorrhage, and abdominal distension must also be taken into consideration when forming a prognosis, while of course symptoms of perforation will point to an almost ineluctably fatal issue.

Treatment: Enteric fever is emphatically a disease in which "prevention is better than cure", and since we now know so much of the nature and mode of growth and spread of the invading organism we should be able to do a good deal in the direction of prevention. Due to the more general employment of the water-carrnig of sewage the disease is less endemic than formerly, and I see little reason why - with the most careful use of antiseptics, with the employment of all the excellent modern sanitary fittings and appliances of the present day, and with the use I hope of a certain anti-typhoid vaccination - this disease should not be banished altogether from our country.

Prophylaxis: The recent large epidemics mentioned previously have shown how important it is to have the water-supply of a town - or any community - absolutely free from even the suspicion of fouling by specific infections. No doubt this can, and will be accomplished, but it can only be done by remedying what may have been proved to be existing defects. The collecting grounds, storage tanks or reservoirs, filter beds, delivering and distributing mains should
all be subjected to careful supervision, for it is only by the most unremitting attention that a water supply collected from an area of many square miles, can be kept, and delivered to consumers in a condition of purity. Individual precautionary measures consist in boiling all drinking water, and milk, or in not drinking any water at all – (after Prof. Amandale, who after a visit to the United States where the purity of the water was doubtless informed his clinical class on his return that “he was careful never to drink any water at all.”) It is often advisable to use, and to recommend the use of beer, wine, or some Table water – (such as Salterris, affolter’s, Puritas, etc.) whose source and purity are authentic.

In the actual conduct of a case of this disease one of the most important considerations is its early recognition and notification, for it has frequently happened that one case, not early recognized and isolated has been the starting point of quite an epidemic. As soon as the medical attendant begins to have even a suspicion that the disease he is treating may, perhaps, turn out to be enteric fever, the case should be treated as an infectious one from that moment. The nature of the case need not be publicly announced, but all means should be taken to arrest the spread of possible infection. These may be stated to be as follows, and the medical attendant must be strict in his insistence that everything is done thoroughly and as he directs.
1. The patient should be put to bed in a room, well-let, large, and having a fire place, and as far as possible from that part of the house occupied and used by the family. The difficulty in private practice very often consists in the finding a suitable room, or in prevailing upon a patient to allow himself to be removed to hospital where the hygiene conditions are much more to his favour than at his own home.

2. A nurse—or two nurses—should be appointed whose sole work it should be to attend to the patient and the sick-room. Where all possible proper trained nursing should always be obtained for relatives are notoriously apt to disregard instructions, and then to blame the doctor for any untoward result.

3. A liberal supply of disinfecting agents should be provided—for mixing with the motions and for cleaning bed-pans and all utensils and instruments in contact with the patient; for boiling with the bed and body linen, and for use generally in the sick-room. "Santus," "jeyes fluid," "soap," "condy fluid," carbolic acid, chlorineated lime and mercuric chloride are the agents most commonly employed, and of these I have a great preference for carbolic acid and mercuric chloride. "Santus" and jeyes fluid may be used as adjuvants for their odour is refreshing and wholesome, and as a rule, agreeable to patients, but the actual work of disinfection can only be done effectively by the stronger pure chemical agents.
be used to wash out all commodes and urine bottles employed, and should be mixed freely with all the
patents' secretions before the latter are emptied.
Therapeutic chloride (Hydrochloric Perchloridum), which can
be so conveniently kept in the tablet form of Dyers and
Wellcome — 1 tablet dissolved in 1 pint of water — a solution of 1 in 1000 may be used in the same way.
Where there are privies, or where the secretions are to
be deposited on the land, the disinfectant should be
clorinated lime or that mixture of chlorinated lime
and crude carbolic acid which is now so largely used
by most local sanitary boards.
(4) All linen in use about the patient or his bed —
draw sheets, napkins, handkerchiefs, &c. when removed
should be at once put into a disinfectant solution
and subsequently boiled.

Treatment of the Patient: (a chart should be obtained
and systematically filled in for by this means both
time and memory will be saved for the doctor). The
patient should be allowed to waste no unnecessary
energy either by talking or reading; his strength
should be economised from the very beginning.

Diet: The staple diet should be milk. The
digestive power of a feverish patient, however, seems
to be in inverse proportion to the height of the temp-

erature, and many patients cannot digest pure
milk, and I have found a patients own feeling
in the matter of diet very often the most correct
guide. They like water, and it is often advisable
to dilute the milk - either with plain water, which is probably the nicest, or with barley water, or with some aerated or table water, or a lump of ice may be allowed to melt in a cupful of milk, and no doubt ice is one of the most grateful adjuncts to the diet - especially if the attack occurs in the height of summer. I have found that there is a strong feeling among the genuine public that it is very unadvisable to allow any one who is feverish to drink cold water, but I always take particular care to impress upon such persons the fact that water may, and often should, be drank in large quantity by any one who is "sick of a fever," while I have many times heard patients say in the height of pyrexia that they "comes not with ice it nor for the ice." The amount of milk to be given will depend upon the age and age of the patient. An adult should have 24-32 pints in 24 hours, taking about 4 ounces at a time, diluted at intervals of 2 or 3 hours. Should the patient sleep fairly naturally, he need not be awakened to have his milk, but if he be in a state of semiconsciousness he must be roused and fed regularly. Weak beef tea and chicken broth are often greatly relished, as they seem to have a sort of cleansing effect upon the tongue, mouth and stomach, and they should be given alternately with milk when there is a tendency to constipation - or when the milk is found in the motions in a state of curd.
This diet will be quite sufficient to sustain the patient during the period of pyrexia, but as fever subsides a ravenous appetite is often developed and may be satisfied by the addition of some boiled bread, milk, or some well cooked arrowroot or corn-flour. In making this "bread and milk" for an emaciated patient the bread used should be at least two days old, and after being mixed with boiling milk should be allowed to stand or simmer for two hours. For this renders it much lighter and easier of digestion. When the temperature has become normal a little white fish may be added, and this, if causing no increase of temperature or bad symptom, may be followed in two or three more days by some boiled chicken and plain bread. By this careful increase we establish convalescence and return to ordinary diet.

I cannot agree with Dr. Barrs of Leeds in his "plea for a less restricted diet in typhoid fever" (BMJ. Jan. 16, 1897). I was well acquainted with Dr. Barrs during winter before the publication of his lecture, and have cause to regret the upshot of the only case in which I tried the experiment of giving mincéd meat, poached eggs, etc., during the middle period of an illness because the patient expressed a desire for "something more than slops". Dr. Barrs urges us "to venture to depart from the orthodox and customary dietary of typhoid fever and its convalescence", but no other writer on the subject that I can find supports his views, and
I am not at present prepared to adopt them in their entirety. It may be advisable to push feeding in some of those cases of prolonged convalescence in which a slight increase of temperature is persisting, but very satisfactory results have in my experience followed the careful adherence to a milk and beef tea diet until a normal temperature has been reached and maintained for several days.

Stimulants: Beef tea really acts as a stimulant both on the heart and nervous system but it is the question of alcoholic stimulants that is now referred to. The majority of cases do not require them at all, and are better without them, but cases are met with in which not only does the administration of brandy or whisky do good, but in which it is an absolute necessity. Middle-aged people will almost to a certainty be helped by the use of regular doses of good whisky or brandy, and those who have been addicted to the use of alcohol may have their lives prolonged, or may "rally through" an illness by the help of free stimulants. In ordering stimulants the guide is the patient's general condition, special attention being paid to the state of the pulse. A weak, flagging, intermittent or irregular pulse indicates the need of brandy. A parched and brown tongue also is an indication for the use of alcohol.

The stimulant employed should be good whisky or brandy, given regularly in measured doses according to the age of the patient, and the urgency of the
indication; it may be mixed with the meat or diluted with a small quantity of water.

Medical treatment: I have found that medical men in charge of cases of cutaneous fever may, as a rule, be placed in one of three classes as regards their views of the drugging of their patients: viz.
1. Those who employ as a routine in every case one class of drugs - the drugs all being of an antiseptic or suppurated antiseptic nature. (2) Those who make the patients symptoms their guide and treat symptoms only. (3) Those who employ all of the preceding means - and no doubt those in this class are the most successful with their cases.

I can speak from experience of the good results obtained by adopting a routine antiseptic treatment and have found Chlorine and Salts, especially valuable. About five years ago I was presented with six bottles of a patent medicine named "Massilia," made by the electrolysis of brine or sea-water, which was vaunted as being especially curative in all fevers, especially typhoid fever. The active agent in this was Chlorine; which from the analytical reports was present in solution in fair amount. I had at that time under my care an entire patient in the second week of fever, a rather bad subject for the disease - (Mr. A.G., 41, a cashier, and "son of bee.") His evening temperature was then 106, and his tongue was in the dry and yellowish-brown condition which betokens danger. He had diarrhoea and looked as if he would have
a hard struggle to get well. For want of anything better I put him on "medetoma" and was surprised and charmed with the sequel, for from the very next day he began to improve; his tongue was moist and nearly clean in 3 days, and remained so; his temperature never again reached 104°; the condition of the bowels improved and a hard struggle was nächsten for the man made a good recovery. I shortly afterwards used the same medicine for a young man of 23 and he also did extremely well—he used to "feel better for every dose he took."

I shortly afterwards read Burney's articles on the treatment of enteric fever by antiseptic remedies—and now, as a routine, put a patient on chlorine at once. I make the medicine as directed by Beyer in his "Practical Treatment" (1845 edns., Vol. II, p. 635), using powdered Potassio Chlorate and some Hydrochloric acid, sometimes adding quinine, as advised by him, and I am of his opinion that this mixture exercises a certain amount of general as well as intestinal antiseptic. While (Review of Treatments, p. 924) "has seen excellent results from this treatment in hospital." Beyer and Rye Smith are both rather inclined to scoff at this antiseptic idea and I think this is a pity for my own clinical experience convinces me that the therapeutic value of this mixture is indeniable.

I Salol acts as a good intestinal antiseptic, but I have found it more suitable for use in the milder forms of the disease in children, than for adults—from 2 to 5 grains in powder or tablets should be given 4 times a day.
Of other antiseptic remedies similarly employed Carabolic acid is the most prominent. It is most often given in full or pared form — but Coffin (2nd ed., p. 888) describes a series of 79 cases treated by 4 y. doses of the pure acid, quinac in water simply, with 11 deaths — a mortality of 13·9%, which is considerably lower than the average mortality for encephal in India.

Mercurochloride, Thymol, B. naphthaline, Sulpho-carbolic of Zine, Bori and Carbolic of Gumacol and Turpentine are included in Yer's list of useful antiseptics, but my experience of any of these is limited — in acute fever.

**Treatment by Baths.** The use of tepid and cold baths has been very prominently brought before the profession by many writers, the majority of whom have been hospital physicians, in the medical periodicals during the last ten years, and very favourable results have been recorded. Zinac (Dictionary, 9th edn.) quotes the mortality statistics obtained by Jorgensen by the routine treatment by cold baths. He reduced the percentage of deaths in hospital from 16·14% to 3·1%, while Beschmeyer, quoted also by Zinac, obtained a reduction in death rate from 27·3% to 8·2%.

Ritter (p. 445) says “by hydrotherapy 6 or 8 patients in 100 in hospital who would otherwise have died, are saved” and he quotes a 2·3% rate of Breslau Hospital whose mortality from encephal was reduced by hydrotherapy from 14·8% to 7·5% — and this last figure seems to be about the average mortality in all hydrotherapy statistics. It is also claimed that by this cold bath treatment, for it is emphatically a cold bath treatment—relapse,
haernostage and perforation are less frequent — and in all probability this is so, as any circumstance which tends to mitigate the intensity of each attack, must help to lessen the liability to the complications mentioned.

It is chiefly on the Continent and in America that this treatment has been adopted as a routine, and Yes, Zaggo, Hulshoff and Bristow are all opposed to its adoption as a routine treatment.

I cannot speak on this subject from a hospital experience or exhibit any elaborate statistics, but I am convinced that it is quite impracticable in private practice. No doubt cases of hyperpyrexia pure and simple can, and must, be treated by cold baths but in the great majority of cases of enteric fever the bath can be dispensed with altogether. Certainly in hospital, under the eye of a skilled house physician, and in the hands of capable nurses (and plenty of them) there can be little objection to the employment of a treatment for which so much is claimed, but it seems to me that it is chiefly in hospital practice that its proven lies.

But in private practice an almost equally successful, and certainly for the patient a more grateful means of treatment consists in tepid and cold sponging, and in applying an ice-bag to the head. For some years I have adopted sponging as a routine — being at first led to do so by observing the refreshing and soothing effect which followed sponging of the face and arms. Individual cases of the disease vary so much that no hard and fast line can be drawn as to further
treatment by the application of ice-bags and cold water - but in the majority of cases where the temperature reaches 105° or in any case where there is much headache and restlessness - the use of an ice-bag for the head, and the four times daily, sponge of the face, arms, legs and back with a large sponge squeezed out of ice-cold water are always followed by a fall of temperature, and a feeling of less illness and discomfort in the patient. All such cases should be sponged for ten minutes night and morning only, the nurse doing each part of the body carefully and systematically. More severe cases should be sponged 4 times a day - or if the temperature be high, every 3 or 4 hours. In any case in which there may be a tendency to hyperpyrexia a "four hours" chart should be kept until all serious symptoms have subsided - for it is important to attack hyperpyrexia early, and to keep up the attack until the temperature keeps within reasonable limits. I generally sponge the face and neck first for two minutes - then the thighs and back, especially down the spine between the scapulae, for five minutes each, and have found by this simple means a temperature of 105° reduced to 100°. One nurse can do this, and can repeat the operation as often as may be necessary whereas to lift an adult patient into a cold bath requires three people at least. I have said the sponge should be squeezed out of ice-cold water, but advise that a few strokes with a sponge soaked in tepid water be used first, as this is less of a shock.
Treatment of Complications (includes the chief points in "symptomatic" treatment)

I. Sleeplessness: we seldom require to interfere artificially as the diet is so easily digested that sleep comes naturally but there are cases that require hypnotics. If two successive utterly sleepless nights occur we should give a dose of bromide, 30 to 50; or of Hygro Chloral. 20 to 30; and in cases of great excitement and delirium we may find it necessary to double this. "Imbrosq


Chloral" is a useful preparation for the sleeplessness and delirium of children.

I have found a combination of Phenacetin and Sulphonate act very well in severe cases, giving 10 grains of each at the same time; probably the Phenacetin has a primordially soothing influence on the headache and temperature, and the Sulphonate works in later and keeps up the effect. Or 30 grains of Sulphonate may be given with 10 grains of Phenacetin, the 5-grain tablets of "Bromides Wellcome" being very convenient for use in adults.

Brandy, in cases where ferment is due to pure exhaustion, may be found useful, while the ice-bag and cold sponging mentioned previously are also very helpful in inducing sleep.

I. Diarrhoea: The management of this is often a question of the management of the diet. If curds are found in the stools lessening the supply of milk by one or two units, a day, and adding barley water or lime water instead will have a good effect, or some well-made arrowroot gruel may be used to replace
one of the meals should be having much beef tea, the amount should be diminished—or it may be stopped entirely for two days, and the effect observed. Should the diarrhoea still be proving troublesome I have found a mixture containing T.C. Opium, Acid, Bichlor. Form. and T.B. Chloroformi, act more effectively than either Bismuth or Dover's powder which are recommended. Small sugar enemas containing 10-15 grains of Dover's powder are useful in children who may have any difficulty in swallowing medicine—but it is very rarely necessary to employ them for diarrhoea.

If haemorrhage should this occur we must insist upon absolute rest, the patient not even using a bedpan but passing his motions into some old linen which can be removed and burned. The abdomen should be covered with a light layer of cotton wool secured by a thin, firmly applied bandage, and the amount of food allowed for one or two days be reduced to a low level, small quantities of iced milk or iced milk and barley water alone being given. Stimulants should not be given during haemorrhage unless the indication is very strong indeed. Acetate of lead—(gpp. 1/2 to 1/4 T of dilute acetic acid) is probably the best medicine, this dose being given every 2 or 4 hours for 24 hours. I have found this very helpful in two cases of haemorrhage. Tartrazine in ten minims doses is also recommended, but I have not used it. I have tried the enemas of mucilage, starch, tannic acid and Dover's powder advised by Geo.
but did not satisfy myself that they were of any
special utility — in fact I once or twice thought that
they excited the bowel rather than otherwise, and they
certainly disturbed the patient.

Perforation: Prompt operation may occasionally save
life. Keen (B.M.J. Mar. 25 1899) says “one third of the
cases if operated upon promptly showed recovery”; Osler
(p. 45) says “no case is so desperate, unless actually moribund,
as to be without some hope in the hands of a good
surgeon” — but as a matter of fact the number of
successful surgical interferences is very small.
The patient shown at once have a hypodermic dose
of opium, and opium in full or solution must be given
freely every one or two hours until all symptoms of
shock have disappeared. Small quantities of water
or barley water only should be administered and the bowels
must be kept constipated for eight or ten days, to be
moved at the end of that time by means of repeated
olive oil enemas.

Cardiac Failure: this — which generally is not with
late in the disease — is generally overcome by a
little extra attention to the matter of feeding and
stimulating. Beef-tea, chicken-tea and whisky should
be given at frequent intervals according to the
state of the pulse, while the regular administration
of doses of a mixture containing strychnine and
digitalis will always be of assistance.

Anti-typhoid Vaccination: this subject is at present
occupying the attention of many experimenters, and w
all probability success in this direction will be attained
in time. Dr. T. S. Rosebank (Lancet 1898 p. 107) in a
paper read before the Pathological Society of London described
a serum he had obtained which although not an antitoxin
had conferred a certain immunising effect. Dr. Chautemas
of Paris (Lancet 1898 p. 1363) claims to have obtained an
antitoxin serum, which he says "has given the best
results in patients suffering from typhoid."

Dr. A. E. Wright, and H. Kelly (Lancet 1897) publishes a
paper giving an account of an "antitoxin serum",
which "although the bacilli of typhoid are not killed
by it -- yet acts such a deleterious influence on
them as results in the effectual protection of the
patient against typhoid fever." In the recent
Blackstone epidemic Dr. Wright vaccinated 88 inmates
of Boringy Asylum with his serum and all escaped,
while 16 cases of enteric occurred in 120 not vaccinated.

But a little further evidence is necessary to assert
definitely that a genuine antitoxin vaccine has been
obtained. I believe the serum is being used in
the British and native army in India in districts
where enteric fever is prevalent, and the results from
this direction will be anxiously looked for.

In conclusion I show suggest that the best means
at present at our disposal for combating this disease
are (1) a careful adherence to milk diet - (2) the
administration of antiseptic medicines - (3) the
routine employment of cold and tepid bathing,
and above all (4) that the physician
should give as much of his own personal attention to each case as his time will permit, and insist that every detail in the management of the patient, from first to last, is carried out rigidly according to his instructions.
J. O. from farm, a fair man, aged 47, from about August 12th until late in the month, had complained of loss of appetite and loss of strength, and had carried on his usual work, being out in the fields engaged in harvest operations for 10 or 12 hours a day at a season when the heat was unusually intense. On August 20th he suddenly became very ill, while out of doors being attacked with severe headache, vertigo, and vomiting. After having his head and face in a running stream he succeeded in mounting his horse, and rode home 15 miles, though he afterwards had no recollection of how he reached home. His wife put him to bed, but did not send for me until the following day (Aug. 21) - then sending a message that she thought her husband "must have had a stroke." I saw him at 8 a.m. He was then unconscious and breathing shallowly; face deeply flushed; pupils equal but rather dilated and sluggish in their reaction to light; pulse rapid and extremely unregular; and temperature 105.6°. His pulse was so unsatisfactory that it looked as if he could not possibly rally, but a hypodermic injection of strychnine and digitalin was given and repeated in 15 hours - while ice, which luckily was at hand in large quantity, was applied in a rubber ice-bag to his head. He was sponged with cold water, down the spine for 20 minutes and his temperature fell to 103°. At midday his temperature was 105° and he was again cold sponged down the spine and over the thighs and body until the temperature in the rectum was
100.4. He could now be made to swallow and a
dose of calomel was put on his tongue and an
effervescent mixture containing acetate of ammonia was
prescribed - to be given every 3 hours. A rash somewhat
like that of scarlet fever was noticed on his arms and
neck, but it was looked upon as being due to the
intense heat - (although there were some cases of scarlet
fever in the adjoining village at the time). I formed
the opinion that he was suffering from meningial
trouble due to sunstroke. He remained in much
the same condition as when first seen for four
days, his temperature generally reaching 105° at
some period of the day, and only being kept down
by repeated sponging. By this time, however, his
pulse had improved a good deal, averaging 96 per
minute, and being quite regular, and he also now
showed occasional glimpses of consciousness. He lay
on his back and except for occasional delirious
mutterings never spoke: but he swallowed little
appetizing meals, barley water, weak beef tea and
his medicines. Urine and faeces were passed involuntarily
and sores developed about his lips and teetn in spite
of every attention. After eight days he was noticed
to be feeling "free" on arms, legs, and body, thus
showing that the supposed "red rash" had really been
that of scarlet fever. During the next few days his
brain condition was much better and he was able
to tell of his longing to feel ill in the fields and
take a little about his work but his temperature
still kept up, ranging from 101° in the morning to 103.6° at night, and he began to complain of a feeling of painful distension in his abdomen. On examination, this was found to be very tympanitic. He was now kept on a rigid milk diet carefully administered by two trained nurses, provided by his employer, and as the motions began to be frequent, 4 or 5 a day, a mixture of Tr. Biph and Ac. sulp. ars., was prescribed, along with 5 grs. of Dover's powder every night. The evacuations were light yellow in colour and semisolid in consistence and the presence of typhoid fever was evident. On Sept. 25 his temperature rose to 104.4° and he had a distinct rigor and a slight haemorrhage from the bowels. Dover's powder was given three times a day now and an enema of starch, tannic acid and Dover's powder was given, but only retained for about three minutes. He had again relapsed into a semi-conscious state, only talking or drinking when roused up. On Sept. 26 when his morning temperature was 104.2° another rigor occurred and was followed by the discharge of about four ounces of bright cherry coloured blood, that evening his temperature was 105.6° and he died early on the morning of the next day—his death being preceded by another severe rigor and the expulsion of several ounces of dark blood. His temperature an hour before his death was 100°.

This man seemed to me to have suffered from
Meningitis, due to meningitis. 21. Scarlet fever, which attacked him while he was already incubating an enteric fever.

I think he must have had meningitis – or at least an intense intra-cranial congestion – due to the onset of the scarlet fever and aggravated by the action of the sun for the degree of pyrexia was not, of itself, sufficient to produce the grave effects upon the higher nervous and cardiac centres, which were present at the beginning of the illness; the scarlet fever was proved by the sickness, rash, and unusual typical feeling; while the later phases left no doubt as to the presence of a severe attack of enteric fever.

It is unusual to find scarlet and enteric fevers running together as in this case, but there seems to be no special reason why such a condition should not exist. Scarlet fever and diphtheria are not infrequently met with in the same patient, at the same time, the one disease in fact seeming to pave the way for the other – while measles and scarlet fever have also been recorded as occasionally coincident.

Dexter (3rd edition) says that of 48,366 cases of scarlet fever 11 enteric was also present, so that the proportion is certainly very small.
Mrs. J. - aged 43 - married, with a family of six children, living in a healthy part of the Village of Crofton where no enteric had occurred for 14 years - requested me to see her on June 13/97.

She complained of feeling "weak and languid" and was unable to do her ordinary house-work. She was very pale, and delicate-looking; had no pain; but had lost all appetite; bowels had been irregular in action for some days, constipation and slight diarrhoea alternating. Her tongue was dry and coated with a white fur; pulse 86; temperature 101°. She was ordered to bed - to be dieted on milk and beef tea and a treacle acid mixture was prescribed. After four days her temperature in the evening was 102.5 and her pulse 96, and the bowels were in much the same condition as at first. She was now put on the treacle mixture, and as diarrhoea was pronounced beef tea was discontinued and milk and barley water alone were given. Her temperature was fully one degree higher, but the pulse never exceeded 100. A troublesome cough was present, and as a sister had died of phthisis a few months previously, her relatives, in spite of my assurance that the disease was enteric fever, began to be uneasy, and asked that a neighbouring, older and more experienced practitioner than myself, should see her in consultation with me. Unfortunately I was prevented from being present when Dr. S. paid his visit, but I was told by the
friends in the evening that after a careful examination he had informed them that the disease was "galloping consumption" and that the patient could only live for a very few weeks at the most. — and a letter from Dr. A. the following morning confirmed their statement. Except for occasional slight cyanosis his breath sounds were normal, and she had not the small, quick-rising pulse — up to 120 perhaps — that was associated in my mind with acute pulmonary tuberculosis. Considering carefully the whole history of the case, especially the pulse rate and the pulse-temperature ratio, I could make no other diagnosis than enteric fever, and in the end I was justified for the temperature gradually came down, and a good convalescence was followed by a complete restoration to health — and the patient is still alive.

The following is an account of an epidemic of "water-borne typhoid" which occurred in the village of Accrington, the facts of which were communicated to me by the late Mr. Ernest Hall, at his request, at a time when he was engaged in collecting statistics of water-borne and milk-borne epidemics.

A youth of 19, working in Leeds, came to his home in Accrington on June 24th, and a few days afterwards was found to be suffering
from enteric fever. His mother, who nursed him, was instructed to bury all his excreta in the fields opposite the house and well away from the road. The weather was warm at the time and for several days no rain fell, but in the first week of July severe thunderstorms accompanied by heavy downpours of rain visited the district. About the middle of July my late partner, George Wors M.B., and myself, found several other cases of enteric fever in houses in the immediate vicinity of the first case. Within three weeks we had 27 cases under our care and the number eventually reached 43. A little inquiry soon discovered the cause of this epidemic.

The one thing common to the community was the water supply, which was drawn from a deep covered well - or rather partially covered well. The houses are in double rows on each side of the main road; - the fall here being about 1 foot. An open gutter runs along one side of the road, and passes the well at a distance of three feet. The house where the original case occurred is situated at the top of the hill, on the opposite side being a high bank and beyond this the fields in which the motions should have been burned; but what happened was really this: - Instead of being always conveyed into the fields the motions has sometimes been carried across the road only and defecated
on the bank; here they remained for a few days until the heavy rain came and washed them into the gutter; this in its turn, conveyed them rapidly down hill towards the well, situated about two-thirds of the way down. During to the unusually heavy rainfall the gutter overflowed and part of the entire debris found a way into the well.

We had five deaths out of the forty-three cases, a mortality of about 11.8 per cent.