So many drugs have of late years been put forward as more or less specific in the treatment of Typhoid Fever, that it seems almost presumptuous to take up such a subject for an essay; and yet to accept the old theory that all things are useless to check, control, or cure this disease, and that in careful nursing and dieting alone is hope for the patient, seems to deliberately close the door on all advancement in this direction: believing, as I firmly do, that where there is a disease depending on a specific poison there will ultimately be found an antidote for that poison, and a means by which such antidote can be administered so as to act upon the poison within the system, neutralizing its ill effects and assisting its elimination; and in no class of diseases does this seem to be more possible than in those which are caused by the action of living organisms. I believe that the Physician of the future, with his more perfect knowledge of these living organisms, their life history, and the chemical poisons to which their life in the human tissues gives rise, and with a more perfect armament of drugs at his command, will be able to destroy such living organisms in the system, or at any rate to neutralize the chemical poisons which are produced by their existence, and that so Tuberculosis, Pneumonia, Typhoid Fever,
Cholera, Yellow Fever, and the Allied Diseases will one by one be conquered and brought under control, at least in their earlier stages.

It was in May 1890 that I first obtained a specimen of Salol and began as far as possible to study its properties with a view of using it in Cholera should the opportunity arise. Of the reasons which led me to believe that it would be of little use in fully developed Cholera, it is needless to speak; but it soon occurred to me that it might prove a valuable drug in Enteric Fever, and early in June of the same year I began to use it in that disease. I was led to this by the following considerations of the probable and possible causes of Typhoid Fever:

**Theory.** That the disease is caused by certain bacilli developed in the stools of people already suffering from Typhoid, or as others assert, in decomposing animal organic matter, apart from the presence of Typhoid evacuations. That these bacilli or their spores gain access to the human intestine in food, or more commonly in drink, and thence pass into the mucous membrane, lymphatic glands, spleen, and blood, where they increase and multiply during the earlier stages of the disease, being especially numerous when the ulceration of Peyer's patches begins. In the later stages they gradually disappear and are replaced by other microbes.

These special microbes were first observed by Koch in 1871, but were first fully described by Elberth, and Klebs. Klebs found in Peyer's patches, mesenteric glands, duodenum, and lungs, bacilli which he describes as yellow. - Rods, 0.0002 mm thick, end of various...
lengths forming filaments up to 0.05 mm long. These bacilli form spores.

Eberth describes the bacilli as short bacilli rounded at their ends, and sometimes constricted in the middle. Some of them contain spores and they stain very freely with methyl violet. These bacilli Eberth considers as the real cause of typhoid fever, as they are the only ones he found in the blood and internal organs. He found them in blood, spleen, liver, and sometimes in the kidneys and urine. Other observers have described micrococci in colonies, in the tissues of the intestinal mucous membrane, mærenchymatic glands, and spleen. Gaffky has made artificial cultures of Eberth's bacilli on gelatine and potatoes, and they produced endogenous spores at a temperature of 38.6°. The inoculation experiments, however, failed to produce true Typhoid fever in the animals experimented on. It must also be noted that these bacilli have not been found in much more than fifty per cent of the cases in which they were searched for, and possibly the special microbe of Typhoid has yet to be discovered.

On the other hand Gaffky's experiments were probably performed on animals whose livers were in perfect order, and if they had been performed on young men with well-knit livers, the results might have been widely different.

2. Theory:— Professor Aitken, in his recent work on "Animal Alkaloids," suggests a theory of what may be called auto-infection, without the intervention of bacterial action. He points out that Gautier has shown that animal alkaloids are a necessary product of vital physiological processes,
and that a fifth part of our tissues are cell in the manner of ferments, that is they are unarranged, or potentiactive in their life. He also points out that many of these alkaloids are distinctly poisonous; that the liver is the chief organ concerned in the destruction and elimination of such poisonous alkaloids; that the liver being inactive from any cause, such poisons may find their way unchanged into the blood and system at large; that, in exhaustion from any cause, as starvation or over exertion, the liver is one of the first organs whose functions suffer; and he quotes Lander Bruntin to prove that the vital processes are much more readily arrested by the accumulation of waste products within the organs of the body, than by any want of nutriment of the organs themselves. He also quotes a case of exhaustion fever, cured by simple rest, which M. Chomel diagnosed in the first instance as Typhoid; and he makes the following statement: "It is in special circumstances that bacterial invasion may start from mucous membrane... They-bacteria—we unable to settle in a perfectly healthy body, and can only develop when the physical-chemical condition of the tissues is morbidly altered to suit their requirements." Professor Keighin also quotes experiments of Bock and to prove that Potmaires are present in diarrhoea, typhoid, and normal stools; are absorbed from the bowel, and appear in the urine; and he adds in it probable that Typhoid fever is a sterco-rumic? Beaunomi experiments show that poisonous substances are absorbed from the intestines in health, and are converted into innocuous combinations,
chiefly in the liver, before entering the general circulation. We know that abundance of glycogen in the liver increases its power of destroying such poisons as are presented to it. This power diminishes as the glycogen disappears, and what is true for the liver is probably true for other parts of the body.

Leuken Biermann holds, that the poisonous products of the typhoid bacillus are secreted into the intestines and reabsorbed from thence.

Now, without adopting Professor Aiths view of auto-infection in its entirety, it is remarkable that bacteria are unable to develop in a perfectly healthy body, is worthy of serious consideration in relation to the above fact; for we know that the bowels are constantly full of bacteria and micrococci, and nutritive albuminous substances. We also know that a large number may all drink water or milk polluted with the special typhoid poison directly traceable to a typhoid source, but only a comparatively small number of them will develop typhoid fever. It is those which escape the liver is properly performing its functions as health sweeper to the internal economy. The bile is the great disinfectant of the contents of the intestines, and prevents the too great accumulation of bacteria and poisonous alkaloids within the bowels. The liver further seizes upon such poisonous products of bacterial putrefaction as are absorbed from the bowels, and converts them into innocuous substances of such a nature that they are easily excreted by the kidneys; but if a person is subjected to excessive fatigue, or starvation, or both combined, what occurs? The liver ceases to act properly; glycogen disappears both from the
Liver and the other tissues of the body; there is deficiency of bile poured into the bowel; the poisonous products of putrefaction in the bowel increase, are absorbed, pass the liver into the general circulation, and still further depress the system. Also it is highly probable that in the systemic famine a sort of exhaust action is produced, and more absorption goes on from the intestines than in the case in well-nourished or unexhausted animals. The whole system is poisoned and vitality lowered; respiration is checked, and waste products from the system accumulate, producing still further depression and loss of general vitality, and still further action of the liver. The vitality of the cells of the mucous membranes of the intestine is lowered, and their physical-chemical condition is so markedly altered as to admit of the invasion into them of the typhoid bacilli, should such be present in the contents of the bowel. With this condition of things there will be fevered tongue, headache, lassitude, fever, possibly some bronchial irritation, and may be, a little drier-hour; and the case will be diagnosed as Simple Continuous Fever, or as Typhoid, according to the particular view taken by the medical attendant; but rest and simple food will cure the disease in a few days. The case is one of exhaustion fever, and is probably in great measure a steroneemia. However, the special typhoid bacilli are present in the bowel while the above processes are taking place, they pass into the altered cells of the mucous membrane of the intestine, gain admission to the weakened system unchecked, and all the symptoms of true Typhoid rapidly develop. After increasing and multiplying for a season, these special bacilli
begin to decrease in number and finally disappear; but they leave a system loaded with jet's own waste products, and also with other forms of bacilli and micrococcii. These waste products are no doubt stored to a great extent in the spleen and lymphatic glands, and are passed into the general circulation at intervals, producing the remittent and intermittent types of fever so commonly observed when the disease is subsiding.

As Dr. Blundon put it, the dust and refuse of the house are being carried periodically through the passages of the house to be thrown into the dust cart outside, and great dirt and inconvenience is caused in the house during the transit. Now it is perfectly conceivable, that, at this period, one or more of the special lymphoid bacilli, or their spores, which have originally reached the spleen, and been stored up there in, may have preserved their vitality, and being given up by that organ, and excreted into the bowel, may there find in the putrefying albuminous matter of the feces, a suitable niche for their continued growth, development, and reproduction, and so the intestines again become filled with typhoid bacilli, which in turn penetrate the still weakened cells of the mucous membrane, and gain access to the system at large, producing a relapse.

I have taken exhaustion from fatigue, and want of food, as examples of two causes which lessen the functional activity of the liver, and which are at the same time well known predisposing causes of Typhoid fever, but of course any cause which lessened the functional activity of the liver, such as confinement and bad air on board ship, the motion of the ship in many cases, mental depressi
a more, would tend to have the same effect, and a very slight addition to these, in the shape of a little over exertion, exposure to heat, or abstinence from food for a few hours, will bring on an attack of fever. The soldier on his arrival in India is exposed to all these influences, including a daily fast from 5.30 pm till 8.30 am, that is for sixteen consecutive hours, so however perfect the regimental coffee shop arrangements may be, they are of no service to the watchful draft on its way up from Bombay, or say Guereta. After leaving the train box, the men are often exposed to the heat during a fatiguing march in very unsuitable clothing. This is especially so in the case of drafts arriving in March and April, and joining their Battalion at a hill station.

According to this view, the first essential in the production of Typhoid fever, is failure of function of the liver, followed by a certain amount of steatorrhoea, and accumulation of waste products within the system. This is perfectly curable, by remedies directed to the cause which produced the disease. In the one case simply rest and suitable food. In the other a blue pill and mild emetics; unless the second cause be present; this is the existence in the bowel of the specific bacillus of Typhoid.

The next stage, is a specific poisoning of the system by this bacillus or its products, accompanied by local lesions in the intestine; and the last stage, is a continued poisoning of the system, by its own waste products, arising from rapid waste of tissue, and defective excretion combined, and aggravated at pretty regular intervals by flush of waste, thrown into the circulation from the spleen, to be eventually got rid of by the excretory
organs; and gradually tending to recovery as the excretory organs gain strength, and mastery over the load of waste matter presented to them. It will probably be objected, that this theory does not agree with the fact; that Typhoid has a more or less prolonged period of incubation; but it appears to agree well with the fact, that the incubation period is so remarkably irregular. Suppose that a healthy man swallows certain typhoid germs; there is no reason for believing that they will be passed per anum at his next motion. On the contrary, on reaching the lower part of the ileum, they have attained a suitable fecal nidus, and are in a suitable temperature for their continued growth and development. What is more natural therefore than that they should grow, and develop, and infect successive supplies of fecal material, for a considerable period, probably for about a month. All this time if the liver is active, and the mucous membrane healthy, they are as innocuous as if they were in a glass bottle; but, at any period after their admission, should the functions of the liver fail, should there be exhaustion of the system, and lowered vitality of the intestinal mucous membrane, they will penetrate the morbidly altered cells of the latter, gain access to the circulation, and in a few days, or hours, the stage of invasion will be apparent. If this be true, it forces us to the

Note - It must be noted, that the lower part of the ileum is the highest part of the intestine, which contains truly fecal matter, and is at the same time the lowest, from which much aspiration takes place. It is therefore from this point, that a bacillus which requires a fecal nidus for its development, would naturally first invade the system.
conclusion, that a perfectly healthy man, may and
often does, pass typhoid stools, and should these gain
access to drinking-water, one man's meat may become
in the most literal sense, another man's poison. By
typhoid stools, I do not mean those typical stools,
which have not the slightest resemblance to really
good pea-soup; but merely, ordinary stools, which nevertheless
contain typhoid germs in an active state. I hardly see
how we can escape this conclusion, unless we are prepared
to believe that only those persons who dwell on Typhoid
water have swallowed typhoid poison, and that their
compatriots who have all drunk the same water, have
yet in some mysterious manner avoided swallowing
the typhoid bacilli contained in it.

My late friend and fellow student, Surgeon L., was
almost constantly in my company during the six
weeks prior to his last illness at Ablufatneh. We
lived at the same mofa, ate the same rations, drank
the same water, and shared our small stock of
whiskey; we walked, shot, bathed, and fishèd, in
company, and worked at the same hospital. When
not actually with me, his companions were known
to me, and none of them developed Typhoid Fever.
We all drank hill water, unfiltered, freely, and
led active lives, exposed to the full force of the
sun in the open, day after day. Surgeon L. was
in hard condition and excellent health and
spirits, when one morning he started to walk to
a hill which appeared to be some six miles away
across the desert. He got back to Ablufatneh much
exhausted by the heat and distance, which was
nearly double what he had supposed. He had
taken no good in water with him, none was obtainable

by the way, and he was parched with thirst. In company with Surgeon C. and myself, he drank some whisky and until
on his return: he had no appetite, and complained of headache
and a feeling of depression and sickness. On the following
day he had well marked fever, but without any of the
characteristic symptoms of Typhoid. In three days, his
temperature became normal both morning and evening, and
his tongue, which had been slightly furred, became clean;
he however still felt listless, and languid, and a few days
later, developed undoubted Typhoid fever, which terminated
his career in about three weeks from the date of that fatal
walk.

This might perhaps be looked upon as supporting profoun
d within view of auto injection, in which case, the
exhaustion, would be the sole cause of the Typhoid fever.
On the other hand it might be argued, that Surgeon L
had swallowed Typhoid bacilli, which his constant
companions, Surgeon C. and myself, escaped. Against the first
view: I do not think that the theory of auto injection, can be
upheld in its entirety, as a positive cause of Typhoid; and
would point out, that the primary fever differed in its
symptoms, and had subsided, before the Typhoid
manifested itself. The second conjecture, my intimate acquaintance
with Surgeon L, his bacilli, and surroundings, leads me to
believe is extremely improbable, and my conviction is, that
the intestines of all three of us contained Typhoid bacilli,
at this time; that Surgeon L's liver, failed in function
owing to the exhaustion, and that he in consequence suffered
from poisoning by alkaloids of fecal origin, and by its own
waste products; that he was recovering from this poisoning,
and would have done so entirely, had it not been for
the presence in his intestine of the Typhoid bacilli,
which were enabled to fasten on his system in its
Temporarily unguarded state, and produce true Typhoid fever; else that had benefited C. or myself, been subjected to like failure of hepatic function, we should have probably developed the same disease.

Assuming this view to be correct, there is every reason to hope that we may, by thorough disinfection of the contents of the bowel during the premonitory stage of languor, headache, and malaise, prevent the absorption of putrid active alkaloids, and so save the system from that preliminary poisoning, which is needful in order to enable the Typhoid bacilli to fasten on the mucous membrane, and that should such bacilli actually be present they may be destroyed. It seems that on some such view as this, the practice of giving aperients in the initial stage of Typhoid is based.

Unfortunately, it is very rare for patients to seek advice in this stage, and later, when actual lesions exist in the intestine, the effect of aperients is most injurious.

I have myself seen several cases of severe haemorrhage, and one of perforation, follow the administration of purgatives, given under the impression that because it was the first day on which the patients applied for advice, it was therefore the first day of the disease; when a little careful questioning would have elicited the fact—that the patients had suffered from languor, slight headache, want of appetite, and a general undefinable feeling of being unwell, for from ten days to a fortnight previous to their application for help. In fact, I believe that this premonitory stage, in which alone aperients may be given with safety, is rarely seen by the surgeon, and still more rarely recognized. In any case, a suitable antiseptic, would be as effective as a purge, and far safer. If however this premonitory stage were the only one in which
intestinal disinfection was of use, it would be of little advantage to the practical physician, but assuming the theory of Dr. Laudef Bruntton, that the poison is excreted into the bowel, and reabsorbed from there, it may be correct; there is every reason to hope, that a continued and thorough disinfection of the contents of the intestine, will to lessen the intensity of the poison, as to reduce the disease to a comparatively mild type; will shorten its duration, and will guard against relapse. In any case where ulcers exist, it is obviously of advantage to have these ulcers bathed in aseptic products of digestion, rather than in a soup of putrefying alimentary substances. I have especially confined myself to disinfection of the contents of the intestine, as our knowledge of the general disinfection of the system, is at present too vague and unsatisfactory to be of practical use.

Having satisfied oneself that a thorough continuous disinfection of the intestine is likely to be productive of good, the next question which presents themselves for consideration, are; first; to what extent can the contents of the bowel be rendered aseptic? and secondly; what are the most suitable antiseptics for the purpose? We can answer to the first of these questions; that probably the contents of the whole bowel can be thoroughly disinfect, and rendered aseptic. The proportion of combined sulphates in the urine, is the measure of the amount of putrefactive product which are absorbed from the intestine; Baumann has caused these combined sulphates to disappear entirely from the urine of a dog, by clearing out, and disinfecting its intestine, with Calomel. It is doubtful if this could be done so completely, in the longer intestine of the human subject, by such a drug as Calomel.
alone, without giving such a quantity as would be harmful to the patient; but combined with other disinfectants, and with careful disinfecting, no doubt it may be accomplished. The problem is to find the best disinfectant, or combination of disinfectants for the purpose, and among these, sodium is certainly by no means to be discarded.

The antiseptic which we require, must be so far non-poisonous as to be capable of being given in considerable quantities without injury to the system at large.

It must be non-eating to the bowel.

Its depressing action on the heart, if any, must be slight, and easily counteracted by stimulants.

It must have no irritant effect on the liver or kidney.

It must not act so as to check the digestion of milk in the stomach.

It must not be given in such a soluble form, as to be readily absorbed from the stomach and upper part of the intestine. The ideal antiseptic, indeed, would be insoluble in gastric juice, and capable of only slow solution by the bile, pancreatic juice, or intestinal secretions, during its passage along the small intestine.

The first means of securing this asepticity of the intestinal contents, which occurs to us, is a judicious selection, and careful regulation, of diet, and very much can be effected by this means alone.

The next is the natural bile, and no doubt could we stimulate the hepatic functions much good would result, both from disinfection of the content of the bowel and by restoring the power of the liver, to convert the poison absorbed therefrom into harmless substance, before they reach the general circulation. In the very earliest stage we may do this and often cut short the
diarrhoea; unfortunately in fully developed Typhoid I
know no means of effectually housing the time to a
full sense of its duties; all the usual hepatic stimulants
fail, and most of them are inadmissible, owing to their
violent action on the bowel.
Of the chemical disinfectants, there is a large number
to choose from, of which I have only had personal
experience of six; namely, Turpentine, Iodine, Carbonic
Acid, Colonial, Pure Tellurium, and Salol. The action of
Tellurium, I have watched in the practice of others; chiefly
when the disease was called Remittent fever; and never saw
any effect, which would induce me to try it, while there are
manifest disadvantages attending its use. I have, in that,
said to be a very soluble drug, occupied a good deal of
my attention at one time, but from its retarding action
on digestion, it would appear that it is readily soluble
in the stomach at any rate, and indeed it appears to
have been fairly tried without success; as might have
been expected, since the two properties mentioned above,
readily solubility in the stomach, and power of retarding
digested anything, whilst in Anticere fever.
I well employed freely in 1854-55-56, in all cases in which
there was no renal complication, and though the result as
a whole, failed to satisfy me, I still consider it to be
a most valuable drug in certain conditions, as
pneumonia, typhemia, hemorrhage, and extreme debility
with congested lungs. As a disinfectant, it probably fails,
through being absorbed too rapidly, to reach the
lower part of the bowel.
My next experiments were made with Iodine and
Carbonic Acid combined, a mixture which was highly
commended, by in the Retrospect of Medicine 1851.
My colleague, Surgeon Lendrum, had used it with apparently excellent results, in a series of about fifty cases, and I was induced to try it. I used his formula (1 in 4,000 of the 7-year 8-4 hours, and made a careful record.

A long series of cases. On the whole, the results were disappointing. Certainly I had a lower death rate than those of my colleagues who were using similar cases and diuretic treatment without antiseptic, and the drugs seemed to act favourably in those cases which were brought under their influence early, and in those attended with marked diarrhoea, but I could not see that much benefit was obtained from them in those severe cases which only came under observation and treatment when the disease was fully developed. Cases only too common in an Indian hospital. Probably as with turpentine, the greater part of the drugs was absorbed, before reaching that part of the intestine in which alone they could be of much use. At that time the estimation of the amount of post-absorptive absorption, by the proportion of aromatic sulphite in the urine, was unknown to me.

My next series of experiments were made with Calomel, and here the results were distinctly favourable. In all fair cases, tongues cleaned, pulse and weight, and temperatures fell, in a regular manner that was highly satisfactory, and at the same time, the Calomel never seemed to cause, either diarrhoea, or constitutional symptoms.

I have never seen a case of salivation, produced by the use of Calomel in Typhoid Fever, though I have given from 3-4 grains daily, for as much as twenty days in some instances. The favourable influence of the drug appeared to be due to a general stimulating effect on the secretory organs (though its influence on the hepatic secretion was hardly perceptible) as much, as on its
direct antiseptic action on the contents of the bowel, and for the former reason, I still use it in a modified degree, in conjunction with Salol. The dose used was one grain of Colonel, combined with extract of Neoscyamus, and extract of Tenaxodum, given in pill, every five or six hours.

In first using Salol my belief was, that owing to its somewhat inedible character, it was likely to pass the stomach at least, unabsorbed, and that in its further progress, it would be gradually broken up by the pancreatic fluid, and carabolic acid be set free in the bowel, at a level, at which its powers would be likely to be expended in preventing bacterial putrefaction of the contents, instead of being rapidly absorbed into the system, as crude carabolic acid. That this was so, to a certain extent, at any rate, I satisfied myself by proving, that the appearance of carabolic acid in the urine, was produced by Salol much more rapidly in healthy animals fed exclusively on milk, than in those fed on a quantity of meat. In fact, when the animal had been fed exclusively on a large quantity of raw meat, so as to produce considerable intestinal disturbance with very offensive stools, it was very difficult to get the characteristic colour of carabolic acid in the urine at all. The possible weakening action of the drug on the function of the heart, I tested as far as possible on my own person, and satisfied myself that it was so slight, that a fairly large quantity, might be given with perfect impunity. I am aware, how rough and unsatisfactory these experiments necessarily were, and have always regretted, that I have never had at my command the apparatus requisite to test the amount of putrefaction of the contents of the intestine, at any given
time, by a quantitative analysis of the free, and combined, sulphate in the urine.

To patients suffering from Typhoid Fever, I commenced giving
24 grains of Salol every two hours, or about 15 grains a day.
Later, in the earlier stages of the disease, when the heart was
acting strongly, as much as 3 grains every two hours, has been
given with good result, but owing to the longer periods of
continued sleep enjoyed by these patients, the total
quantity, given in the twenty-four hours, rarely exceeded
30 grains. In every case I found marked improvement
brought about by the use of this drug. The temperature invariably
came down; not with rapid evacuation, and a sudden
fall, to rise again in a few hours, as is the case with
Antipyrin, and Antitellur; but with a steady decline,
accompanied by a gradually quieting pulse, a
maintaining and cleaning tongue, and a gradual
relief of bowel distention, and tympanitis. In most
cases, the decline in temperature was regular and rapid,
and the cure proceeded at once to convalescence, without
a check. In others, the temperature declined steadily,
or was held in check for a time, the tongue cleaned to
a certain extent, and the pulse improved, but then
remained a strong tendency to retrogression, immediately
the administration of the drug was stopped.

Examples of these two classes of cases were afforded by
two young officers, belonging to the same regiment,
who were both under my care at the same time, in
the Station Hospital at Mareilly. 2d. W— joined his
regiment, suffering from well marked Typhoid of
about nine days duration. He was taken into hospital
at once, and put on Salol; he was slightly delirious, and
his temperature was 104° 4°. On the following evening it
was 104° 6°. From this it steadily declined, day by day,
The delirium passed off. The tongue cleaned and convalescence proceeded without a check to perfect recovery. Within a few days of the admission of T. W. 25.2.13., was admitted in the very earliest stage of the disease, and was treated with salol from the first. The case proceeded in a very mild way; the evening temperature rarely rising to 102½, and never higher. On the thirteenth day, the temperature was normal, morning and evening, and the tongue was moist and nearly clean; on the fourteenth day, the temperature remained normal. At this period, I handed over the case, in order to take five days leave of absence, and before leaving, I stopped the salol, under the impression that it was no longer needed. My successor continued the treatment in all other respects, but on my return, I was astonished to find, that T. W.'s temperature was ranging between 104¼ and 104½; that he was delirious, with a dry, brown tongue; sores on lips and teeth; considerable dyspnæa; and commencing congestion of both lungs. The M.O. in charge of the hospital, considered his case most serious, and almost hopeless, and had telegraphed to his brother to come to him at once. There was no suspicion that any care of diet had been committed. The nurses were trained sisters; the attendants were well trained men; and both T. W. and his friends, were fully alive to the danger which would be incurred by any indiscretion in diet on his part; besides which, I have T. W.'s solemn assurance, that he took nothing but what was allowed in his diet. The administration of salol was resumed; the temperature gave way very slowly at first, but afterwards more rapidly, and in five days from its readmission, the evening temperature was again only 102½, and the tongue was moist and cleaning rapidly. From this date the case
proceeded slowly, but steadily, towards recovery and there was no further relapse. Surgeon Clement M. S. was so much struck by this case, that he asked me to give him some Salol for a case of his then in hospital, with a very high temperature, which was entirely unaffected by Antipyrin, and Antifein, both of which drugs had failed to reduce it, even temporarily. This man was delirious, with a rapid, weak and at times fluttering pulse, dry brown tongue, and rapid accumulation of mucus on lips and teeth; he had fremitus vomiting, considerable tympanyitis, and congestion of the bases of both lungs. Surgeon Clement was advised to use the cold bath on account of the cardiac weakness. On the morning of the day following that on which the administration of Salol was begun, the temperature showed a well marked remission, and the evening temperature was 0.5° lower than that of the previous one. 3 mg. of Salol was then given to check the vomiting. From this time forward, the temperature steadily declined, day by day, and the patient ultimately made a good recovery without relapse. These three cases, I think sufficiently indicate the general trend of the consecutive series of twenty seven unrelated cases in which I have used Salol. The temperature in all fell regularly and slowly; the tongue was moist and cleaned; tympanyitis was reduced; there was marked absence of the remittent temperature towards the close of the case, and marked freedom from relapse.

If Salol is given from the earliest stages, I think the cold bath will rarely be needed, but it should be given, if the temperature at any time exceeds 102.5°. If the diurese only comes under observation when fully developed, the cold bath is a valuable aid next to
to 90°F, as long as the temperature remains above 102°F. No case of either hemorrhage, or perforation, has occurred among the twenty seven in which I have given Salol. Of course I make no deduction from the statistical evidence of such a small number of cases, but it seems reasonable to infer, that by protecting the ulcers from the very irritant products of albuminous putrefaction, and placing them under the most favourable conditions for rapid healing, we shall best guard against the occurrence of these two "unavoidable" causes of mortality.

In my later cases, where no renal disease was present, I have combined Calomel with the Salol, giving the Calomel in half grain doses, two or three times a day, and think the combination of Salol, in stimulating the excretory functions of the different glands. If there be diarrhea, or the stomach, vomiting, or great weakness of the digestive power, Inulinin, in doses of 2-6 grains is administered every 2-3, or 4, hours, according to the nature of the case. If diarrhoea continues, Salol and Calomel are omitted for a short time, and one of the carbonic acid in half an ounce of water is substituted. In all cases of diarrhoea, the lower bowel is at once cleared by a fairly large enema of an emulsion containing castor oil ⅔, spirit of turpentine ⅓, spirit of quim mixt, and if much tympanites be present, a dram of Turpentine, is added. Throughout the case, the large intestine is evacuated by a similar enema, as often as required to prevent the accumulation of putrid and fecal matter therein. Should great tympanitic strain, a few doses of Turpentine, or pure Terpine, are also given by the mouth, and large linseed poultices,
are applied over the whole abdomen. In haemorrhage, all other drugs are stopped, and Terepine, is given freely by the mouth, with occasional hypodermic injections of digitalis, if the bleeding is severe. I have, however, had no trouble with the latter complications, since beginning the use of Salt. Symptoms of commencing pulmonary trouble are constantly watched for, and treated as they arise.

With regard to diet, my invariable practice is to give three to four pints of pure milk, mixed with half the quantity of freshly made barley water, daily, throughout the whole of the acute stage. Should particles of undigested milk appear in the stools, the proportion of barley water is increased, and if needed a little inulin is given. Ice to suck, and a moderate quantity of pure water at a moderate suitable temperature are allowed. Should the patient crave for them. Should diarrhoea come on, a small quantity of raw meat juice, is a valuable aid to medicinal treatment. Should there be great constipation in the later stages, raw meat juice is given, with, or without, brandy, in quantities carefully regulated to the requirements of the individual case, and if not overdone it is of great value. Alcoholic stimulants are given carefully when the condition of the pulse and tongue indicate the necessity for them, but rather earlier, and more freely, than would be necessary in the same class of cases, in England. They are always given, if the lungs show signs of commencing congestion. Brated water is never allowed. Egg, fish, is avoided as far as possible, but is given; Made with ammonia, or Brandy, in cases of pneumonia, where the bronchial symptoms, are subordinate to the pulmonary ones. The above dietary, is strictly carried out until the temperature
has been normal for three or four days, and the urine shows
signs of returning activity; when a pint of good beef tea,
(not merely a watery extract of the salt of the meat),
is allowed. If it be thickened with a little wheaten flour,
the beef tea is rendered both more digestible, and more
nutritious. If there is constipation, as there usually is at
this period, a little strained oatmeal gruel is allowed,
and is usually very grateful to the patient. No further
change is made (except in chicken tea, or mutton broth,
should the patient prefer either of them to the beef tea)
until the temperature has continued to be strictly
normal for fourteen complete days, when a little
bread, without crust, is allowed with the broth. If
this be tolerated for two days, a little bread and
milk is added. In two more days, a custard pudding
is added; the quantity of milk and barley water
is decreased, and the quantity of broth is slightly
increased. Next day, three more ounces of bread,
without crust, and with a scrape of butter is
permitted. In two more days, a couple of lightly
boiled eggs, of which the yolks only must be
eaten, are added, and the bread, which has now reached
a total of eight ounces a day, is given in any form
the patient pleases. At this stage, a small piece of
the breast of a carefully selected chicken, or preferably
a mite, if in season, is given, well roasted, with a
little gravy and bread, and a trustworthy attendant
is instructed to see, that it is eaten slowly, and
very mouthful well chewed. Minced meals, are an
abomination, as they are spooned down by the hungry
patient unchewed, and unmixed with saliva, and set-
up gastric irritation, diarrhoea, and not improbably
a relapse. After this; the slops are decreased, and solids
are increased pretty rapidly, till a full ordinary diet is reached. No mention of fish, has been made in the above dietary, because in India, they are often hard to get, are always full of bones, and when both these difficulties have been overcome, are not worth eating.

Before closing this essay, I would wish to draw attention to one point about the action of Salol, which has been already touched upon, and that is, the curious absence of the remittent, and intermittent types of temperature, which so commonly precede convalescence in cases in which it is not well. My hypothesis is, that the protid waste which escaped elimination as uric acid during the stress of the disease, was stored up in the spleen; just as according to Dr. Hare's theory, uric acid is stored in the spleen in gout; and that during convalescence, when the blood has been to a great extent freed from the products of tissue waste, which have previously been circulating in it; this protid waste is poured periodically into the circulation, by the now contracting spleen; giving rise by its oxidation, to the periodic rises of temperature; and being eliminated from the blood, in the form of uric acid. This is the more probable, as if the spleen be carefully watched throughout the period of remittent and intermittent temperatures, it will be found to be rapidly diminishing in size. Now it is quite possible, that Salol acts on this protid waste stored within the spleen, in much the same manner as salicylic acid, acts on the uric acid stored therein in gout, assisting in its conversion into a harmless product, which passes into the circulating blood; is converted into uric
acid; and eliminated by the kidneys; without giving rise to any of those unpleasant symptoms, which attend the oxidation of the crude material.

It was my original intention, to have supplemented these notes on the use of Salol, by a large series of cases, accompanied by temperature charts; and I had collected twenty-seven consecutive cases in which Salol was given. For more than eight months I have delayed the completion of this essay, in order to collect a sufficient number to be of value, but have only had three suspected cases of continued fever during the whole of that time. Therefore, incomplete statistics may be made to prove anything, or nothing, and are worse than valueless; I have thought it better to only quote three cases, which are fairly typical of the remainder, and to state in general terms, the advantages, which I believe I have found from the use of Salol. Since writing the above, I see that Dr. Digardin Beaumont advocates the use of Salol in Typhoid Fever, but I have not been able to obtain any record of his cases.

In conclusion I must apologize for many deficiencies in this essay, but in up-country stations in India, there is a dearth of standard medical literature; modern works of reference are hard to obtain; and the apparatus necessary for independent enquiry is wanting. &

§. Note.

With the exception of a few months in the winter 1895-96, I have been absent from England; in the Sudan, Upper Burma, and in up-country stations in India; since August 1894: and this must be my excuse for not writing to put forward any claim to the degree of my university on the strength of such a thesis as the above.
I certifies that this thesis is entirely my own composition
and that it is in my own handwriting, and that I have
been for more than five years in actual practice.

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16th Nov 1891