Summer Diarrhœa.
its
Causes and Prevention.

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Honoured Sirs,

To any one engaged in general practice it is not very easy to fix upon a subject for a Thesis, as, even although one in extensive practice is very frequently coming in Contact with rare and interesting manifestations of disease, he seldom has the opportunity of following the case for any length of time. That such is the case — more especially in the large towns — is the common experience of most general Medical practitioners, as, whenever a patient who is ill from almost any disease, feels he is not getting better, he either puts himself under another doctors treatment, or else he finds his way into an hospital, then the case, no matter how interesting or rare it may be, is lost for observation purposes to the General practitioner. Although that is often how things are done in the large towns, there are still some diseases which the general practitioner usually, has the opportunity of following up

to

to their termination, they are more or less common diseases no doubt, but they are none the less just as interesting and of as much vital importance to the community generally, as the rarer forms of disease, and, it is one of those common diseases, Viz: Summer Diarrhoea or British Cholera, as it is often popularly called, that I have chosen to submit to you as my Thesis, and hope, you may consider it of sufficient importance for the purpose. I write it.

I am quite alive to the fact that the subject is both a large and intricate one, and I have for years looked upon it as an important subject, and have tried to find out what I believe to be the cause of this annually recurring diarrhoea, believing, that if the cause of any disease is properly known; it naturally follows that the removal — if possible — of such cause, will result in at least a diminution of the disease.

Summer Diarrhoea is not by any

means

means a new disease, and that it is not an unimportant one is proved by the fact that in Great Britain many thousands of deaths are annually due to it. That being so, any disease that can claim so many victims is clearly one worth looking carefully into.

I have just mentioned that Summer diarrhoea is not a new disease, neither is it a disease that prevails during the whole year. It is a "Seasonal disease", and has what one might call an "Annual revolution". It is most prevalent during the months of July, August and September, more especially if these months have been warm and dry, that is to say, that, the warmer the Summer is, the more cases of Summer Diarrhoea there are.

Another point to be noted is, that although Seaside towns and the smaller towns and villages are not exempt from this disease, it is vastly more prevalent in large manufacturing towns and cities, and it visits these places in

an epidemic form regularly year after year, but in severity according to the heat prevailing.

I have taken the 8 principle towns in Scotland as a guide viz; Glasgow, Edinburgh, Dundee, Aberdeen, Paisley, Leith, Greenock and Perth, and from the Registrar Generals returns I find that, in these towns during the 10 years from 1892 till the end of 1901, there were registered 9171 deaths as occuring from Diarrhoea. That is a large number of deaths, and represents the loss of many valuable lives to the Country. The exact number of deaths from Diarrhoea in each of the towns named for the last 10 years is,

Glasgow	4254
Edinburgh	1273
Dundee	1407
Aberdeen	688
Paisley	478
Greenock	501
Leith	410
Perth	160
total	9171

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I said in page 3 that this is a "Seasonal disease", and that it has what one might call an "Annual revolution", that is proved by still further looking into the Registrar Generals returns, and from them I have been able to make up the following table, which shows, that, of the 9171 deaths from Summer Diarrhœa during the past 10 years, 5296 or 57.74 % of them happened during the months of July, August and September.

Town	Population	Deaths from Diarrhœa during the last 10 years	Deaths from Diarrhœa during the Months of July, Aug & Sept of these years	Percentage of deaths during these months.
Glasgow	760,423	4254	2572	60.61 %
Edinburgh	316,478	1273	863	67.8
Dundee	160,871	1407	624	44.35
Aberdeen	153,561	688	262	38.11
Greenock	67,645	501	342	68.24
Paisley	79,355	478	300	62.76
Leith	76,667	410	252	61.66
Perth	32,872	160	81	50.62
		9171	5296	

These

These figures prove that there must be a definate cause for this desease, and that, the cause, whatever it may be, must be more virulent during the months of July, August and September, seeing the percentage of deaths during these months in all the towns named, except Aberdeen and Dundee, is greater than in the other nine months of the year put together. It is also noticable, that the mere factor of population in any of the towns does not determine the percentage of deaths so much as their Commercial activity and Sanitary Condition.

From the statistical table I have made up, it shows that Greenock has a population of 67,645, and that there died during the last 10 years, 501 people from diarrhoea, and of that number 342 or 68.24% died during the months of July, August and September. Are there anything about the conditions under which the people live in this town, or anything about the town itself to account for such a large percentage of deaths.

deaths during these three months. I think there are. Greenock as well as being a busy Commercial town is very closely built upon, and its streets are for the most part very narrow and extra dirty. The houses in the old parts of the town are mostly old, dark and damp, and have little Air-space at the back of them, while the houses that have been erected recently in the newer parts of the town, are more or less confined and cramped for want of space. Edinburgh has a population of 316,478, and during the last 10 years 1273 deaths were registered as due to diarrhoea, while 863 of these deaths happened during the months of July. August and September, giving a percentage of 67.8 for these months. Now, the conditions of living are different in Edinburgh from Greenock, yet the percentage of deaths from diarrhoea during the summer months are almost as great. Edinburgh cannot be called a manufacturing town, but it is a very old town, and abounds in insanitary areas. In the old parts of the

town

town, many of the houses are very old, very high, and very dark and gloomy, and such a thing as a decently sized back yard is not to be had. The streets also in the old parts of the town are narrow, and there being a large traffic over them they are consequently either damp or dusty.

The towns that come next are Paisley, Keith, and Dundee, with a percentage of deaths during the summer months from diarrhoea, of 62.76, 61.66 and 44.35 respectively. These towns are similar to one another in being large and busy manufacturing centres, and having their full share of narrow dirty streets and insanitary areas generally.

In Glasgow with a population of 760,423, there have been during the last 10 years 4254 deaths from diarrhoea, of which 2572 or 60.61% occured during the months of July, August and September. No doubt that is a large number of deaths from such a disease as diarrhoea, still if Glasgow had had the

same

same proportion as say Greenock, the number of deaths during the three Summer months would have been 3844 instead of 2572.

Glasgow undoubtedly has still many undesirable and insanitary corners that want clearing away badly, but the forward movement, and the truly heroic efforts that are being made to sweep away these filthy dens, will yet have its reward in a still lower mortality from diarrhœal diseases, just as it has had from Typhus fever.

If we had the means of knowing, I am certain that the majority of the cases of diarrhœa would be found to have occured within the insanitary areas of each of the towns. My opinion is, that, Summer Diarrhœa is wholly a filth disease, and that its prevalence can be greatly reduced by proper attention to Sanitary laws. That such is the case, is fairly well shewn, I think, by the figures got about Aberdeen. That city has a population of 153,561, yet, during the last

10 years

10 years there have only been recorded 688 deaths from diarrhoea, and of these 262 occured during the months of July, August and September, giving for these months a percentage of 38.11 of the whole. Anyone visiting Aberdeen must be struck with its fine clean streets and houses. No doubt it has its old "pickety" buildings as well as other towns, but the percentage is less, I think, than what is usually to be found in such large cities. It is also blessed by having a pure and bracing atmosphere from the north sea, which will most effectually neutralise the foul air from its insanitary areas. It is truly a favoured place. It has, I am informed, no privy middens, and all the soil is lifted every morning and carted away by the scavenging carts.

There can be no doubt, I think, that Summer Diarrhoea is a highly infectious disease, the infectious matter being conveyed to the system both by inhalation and swallowing, as one

finds

finds it attacking one member of a family after another, in fact, I have known four or five members of a family all laid down by this disease at the same time. There seems to be no age limit in Summer Diarrhoea as it attacks those of all ages, neither is there any class limit, as it attacks all classes if they happen to live within the infective area. I have observed that — I refer to Paisley particularly, as I am better acquainted with the Sanitary Conditions of that town, but I expect it will be the same in all other large manufacturing towns, — this disease might be epidemic in a number of tenements in a street, while the other tenements in the street would be Comparatively free from it. I have also known it to be epidemic in one street, while there would scarcely be a case in the neighbouring street.

Summer Diarrhoea is characterised by a certain amount of Pyrexia, which lasts for a variable period, but the feverishness

usually

usually runs its course in 3 or 4 days. Along with the pyrexia there is sickness and vomiting, pains in the back, great thirst and a brownish dry tongue. The onset of the disease is quite sudden, and the first thing a patient usually feels is sickness, which is followed by a curious sinking feeling in his stomach. He then has severe shifting pains in the abdomen which may last for maybe half an hour, then the diarrhoea begins. Vomiting may precede the bowel movement, or the patient may vomit while the bowels are acting. He may have as many as a dozen motions in an hour; at first they are abundant and watery, but after the bowels are emptied, the desire to go to stool, although as much as ever, is accompanied with great tenesmus, and all that comes by the bowel now, is a clear watery stuff, mixed with mucous and blood. During this time, there are in many cases severe cramps, and death happens through sheer exhaustion.
If recovery takes place, convalescence is slow, as the

the debility following such a severe illness is extreme.

The greatest number of deaths from Summer Diarrhœa undoubtedly happens in children under 5 years of age, and, that has, I think, been the means of its having often been called a childrens disease, and ascribed to the difficulties of teething or other allied affections of childhood. I am convinced that, that is a mistake, as it is only the fatal cases that are recorded; no doubt the number of deaths from diarrhœa is greater in children than in adults, but we have no means of knowing the number of cases in adults that recover. The cause of so many children dying from diarrhœa, must, I think, be due to the intense call the disease makes upon the young Constitution, or to their greater susceptibility to it, and from that, it follows, that, the smaller number of deaths of adults recorded as due to Summer Diarrhœa, must be due to the "Vis Medicatrix Naturæ", that is, nature helping the more robust and mature individual

individual to recover from the great constitutional strain following this disease.

Now, seeing that Summer Diarrhoea appears regularly year after year in a more or less epidemic form, and seeing that, it attacks large numbers of people in certain localities, and seeing also, that, it presents the same symptoms in each individual but with varying degrees of severity, proves, I think, that it is a highly infectious disease, and that there must be a common and distinct Seasonal cause for it. It is then clearly our duty to try to find out what the cause or causes are, and if possible to remove them.

The difficulty of the subject is felt when we try to locate the real remote cause of this disease, but the proximate cause is not, I think, so difficult to find out. It is not of so much importance to know what the nature of the real infective agent is, as to know what it arises from, and how it is conveyed to the individual. The

Reason

Season of the year at which this diarrhoea mostly prevails, and the kind of weather whether hot and dry or otherwise, gives one a clue as to its causation. It prevails in the late summer and early autumn months, and it is more violent if the season happens to be a warm and dry one. Now, during such warm weather vegetable growth is very active, and so also are putrefactive changes in organic substances, and putrefaction developed under the influence of warm weather has long been considered, and I think rightly so, to be the cause of Summer Diarrhoea.

In Professor Cullens "First lines of the Practice of Medicine, a new edition of which was published in 1802. at Vol 2 Page 54. he says that, "the remote causes of this disease — Summer Diarrhoea has been variously judged of. It generally arises in Summer and Autumn after considerable heats have prevailed for some time, and especially after very warm and at the same time very dry states of the weather." And again, in Page 55 he says, "It has been observed

observed that the effluvia from very putrid animal substances, readily affect the alimentary canal; and upon some occasions they certainly produce a diarrhoea. The disease is always contagious and by the propagation of such contagion it becomes epidemic in Camps and other places." He further says, "It is doubtful if the application of cold does ever produce the disease unless where the specific Contagion has been previously received into the body, and upon the whole, it is probable, that a specific contagion is to be considered as always the remote cause of this disease." That opinion of Prof. Cullen although so very old is backed up, like many of his other opinions, by present day authorities.

In Hilton Fagge's Principles and Practice of Medicine 1886 edition, Vol 2, Page 168 it says, that, "Dr. Buchanan has lately made some remarks upon this subject; and while not denying that summer diarrhoea has associations with filth

filth, he is evidently inclined to think that it is really due to a specific "materies" developed by the influence of heat at a particular season." One point, upon which he insists is, that, whatever may be the heat of the weather before July it does not cause epidemic diarrhœa. "The connection," he says, "with Autumnal heat is certain, for the mortality from this disease is much greater in hot than in cool Summers." It also says, "A curious circumstance to which Dr Buchanan draws attention, is that the disease seems to be of modern introduction, as far as can be learnt from the old bills of mortality. At the beginning of the present Century there is no direct mention of it, under whatever name, nor can any special mortality be traced as having occurred in the spring or Autumn months. "But," he says, "for many years past epidemic diarrhœa has been a very fatal disease, sweeping away thousands of lives annually."

Dr Buchanan is perfectly correct in saying

saying that epidemic diarrhoea is more prevalent in the months of July, August and September, and that it depends upon the heat prevailing during these months, and he is also correct when he says that it is more prevalent in hot and dry Summers. But he is certainly wrong when he affirms that it is a modern disease, and that no mention was made of it before the "present Century", as Professor Cullen's work from which I have given extracts, was written, and the first edition published many years before the present Century, and in it this form of diarrhoea was distinctly mentioned and described, and the cause he at that time assigned for it, is precisely the same as that which is now held at the present day, and which Dr Buchanan himself also believes to be the Cause.

That this disease is a "Seasonal" one and more prevalent in the late Summer and early months of Autumn is also proved by figures

figures given by Dr West in his book on "The diseases of Infancy and Childhood, 1884 Edition Page 671. He there gives statistics made up from a "Comparison of the result of eight years observation at the Childrens Infirmary in London. He says he, "finds that, "Of all cases of disease brought before him at that Institution, deaths formed the following percentage.

In November, December and January	7.9%
" February, March and April	9.5%
" May, June and July	15.3%
" August, September and October	23%

Now, these figures exactly correspond with those I have made up and given in Page 5, with this difference. Dr West made up his figures from the number of cases that came before him at the Hospital dispensary, whereas my figures are made up from the total number of deaths recorded during the same months. I had no means of knowing the total

total number of cases that may have occurred, neither had he the means of knowing the total number of deaths, but both his figures and mine shew that there are a higher percentage both of cases and deaths, during the months of July, August and September, which clearly proves the "Seasonal" nature of Summer Diarrhœa.

There can be no doubt that Summer Diarrhœa is an infectious disease, so the various channels by which the infection reaches us must be looked after, and if these are clearly made out, our duty is to remove them as fast as we can; the disease will then be lessened, and many valuable lives saved to the Community. The late Lord Beaconsfield at the commencement of an electoral campaign once said. "In my opinion, the great Question, the great Social question which should engage the attention of statesmen, is the health of the people." and the late Crown Prince of Austria.

Austria, once said, "that men is the most precious capital of the state and of Society in general." These are true words, and it is our bounden duty as medical men and Sanitarians, to try to ferret out the causes of all preventable diseases, and to guide and advise our Municipal authorities in the removal of such causes.

I think that there are four main channels by which the infective "Specific Materies" may be conveyed, these are I Milk, II water, III Air and IV Insects.

I **Milk.** This article of diet is very often looked upon as the premier offender in many diseases, and more especially so if the disease happens to be of an infectious nature, and there is not the slightest doubt but that milk is a very potent vehicle for disseminating quite a number of infectious diseases, but it may also be the case that it is sometimes blamed wrongfully. No doubt milk is a handy

handy thing to fix upon, because we know the great affinity it has for disease germs, and that, coupled with the fact that it is so universal an article of diet, may often cause it to be labelled as the offender when it has nothing whatever to do with the disease. At the same time milk may often be a cause or one of the causes of Summer Diarrhoea, as during the months that this disease is most prevalent milk is very apt to undergo decomposition, and if it is used "raw" when in such a state it may cause diarrhoea in some people, but, perhaps more especially in the very young. But, although milk may be admitted as a cause of Summer diarrhoea in many instances, it cannot by any means be always the cause.

B. Arthur Whitelegge in his Volume on "Hygiene and Public Health, 1899 Edition, Page 330 says, "that at Moorfield Hospital an outbreak of this disease was traced to butter."

If

It is also recorded in Vol II of Hilton Fagge's work on the Principles and Practice of Medicine, 1886 Edition, Page 168, that, "Dr. Crane of Leicester in 1873 looked into this Question and clearly shewed that milk was not always the cause of Summer Diarhoea in Children. He investigated the Condition under which 283 children had been placed who had died from this disease that year, and found, that a large majority of them had lived in houses not in bad sanitary Condition, and that 107 were wholly suckled, 98 partly suckled and 78 fed by the bottle, so that neither the impurity of drinking water nor of Cows milk could have been the Cause of the disease of the 107 who were wholly suckled."

I gather from that statement that milk cannot by any means be the only cause, but, at the same time it may often be the cause of Summer Diarhoea in young children, and more especially in those that are bottle fed.

That

That such is the case most practitioners of experience will I think admit.

In page 315 of Dr Whitelegges work already quoted, he says, that, "Breast fed children are remarkably exempt from Summer diarhoea, and those partially fed come next, but that the mortality is much higher among children artificially fed and especially if fed by the bottle."

We all know that milk drawn from a Cow in the morning will, often during the Summer months be quite "turned" by the afternoon, and milk in such a state will readily set up diarhoea in some people whether young or old. If the milk is boiled it will undoubtedly keep much longer, but even then unless precautions are used in the storing of it, the danger from its use will not be very much lessened. After being boiled the milk should be kept in a scrupulously clean closed vessel, and in a cool place, for if it is kept

uncovered.

uncovered, say, on a shelf in the kitchen, the dust which is loaded with putrefactive germs will fall into it, so that the danger boiling the milk was to avert, will not be lessened in the least.

Dirty feeding bottles and teats are also undoubtedly often a cause of diarrhoea in infants that are bottle fed. In such cases the milk is not the cause, it is the dirt inside the bottle and tube. I would say, that ~~more~~ more milk than the child can take at one time should never be put into a feeding bottle, and any milk that may be left in the bottle after the child has had sufficient, should be thrown away.

Another point to which I attach great importance is, that, after the feeding bottle has been once used, it should not be used again until it has be thoroughly cleaned with boiling water. The teat also should get special attention, so that it may be

perfectly

perfectly sweet and clean before being again used.

II Water. There can be no doubt I think that, drinking water is often the cause of Summer Diarrhoea. Of coarse when drinking water is the cause the disease will be mostly got in adults. During the hot Summer months putrifactive changes are taking place all along our water courses, as along the banks of the reservoirs and streams leading into them, there are usually a lining of vegetation, a lot of which is often, during these months when the water is low, in a state of active putrescence. Now, water readily absorbes gases, and these putrifactive gases are absorbed and held in Solution by the water, and filtration, however efficient it may be, will not remove them, and if oxidation is not complete, or if the putrifactive gases are so abundant that there has not been sufficient time for complete oxidation — as during

during the hot and dry months of Summer the reservoirs are usually at their lowest, while the demand for water is greatest at this same period — then, the drinking of such water which can only rank as Sewage, may readily cause diarrhoea. That, that is not an imaginary cause can, I think be proved by the following three cases which happened in my own practice here, 4 years ago, last August. The first was that of John Jack, aged 56 a widower, a highly respectable, strong, sober, and well behaved man, residing at 23 Queen Street, Paisley, and was employed as a foreman Surfaceman on the Glasgow and Paisley Joint Railway. The portion of the line over which he had charge extended from Greenlaw to Berryknowe on that line. On the evening of the 10th August 1898 he came home from work about 6.30, and after taking a hearty but plain supper, he lighted his pipe and sat down at the window to read the local newspaper. At this time he felt in his usual good health and condition

until

until 8.30 when he began to feel a bit "squeemish" and mentioned the fact to his daughter- who kept house for him- and remarked to her, that, "he thought he had smoked too much that night and that he would go to bed." He then went to bed, but the "squeemishness got worse, then his bowels began to "rumble", and he felt a slight pain in them, but after a little the pain got very bad. About 10 oclock he began to vomit, then his bowels began to run, the pain in his belly became terrific, cramps came on and the bowels moved very few minutes. His daughter became alarmed and sent a neighbour for me about 11.30, and when I got to his house, I found him very ill indeed. I applied the usual remedies, such as hot fomentations to the abdomen, and as he was very cold, I ordered a tablespoonful of brandy to be given him every half hour, and to put a jar with hot water to his feet, so as to get him into a proper state of heat. I also gave them Bismuth XX grs and Pulv Opii 1 gr dis: a powder to

to be given very 3 or 4 hours till the action of the bowels became less frequent. Next morning the sickness and cramps were gone, and the diarrhoea was much better, but he was in a very very weak condition. I asked him if he could blame anything for bringing on this attack, and he at once said, "it must be the spring water at Pennaylea." He said, he had been drinking it rather freely that day, as the weather happened to be very warm and sultry. He further said, "the water was "bonny" and clear, but it had a "funny" taste, but it was the only water they could get." He got much weaker in the afternoon, and died that night at 11.30, the pain did not come back, but his bowels kept "oozing" from him without his knowing it. The Spring water as he called it, was got from the mouth of an open drain pipe, and was only surface water from the fields.

That John's diarrhoea was caused by drinking this so called Spring water was proved the evening after

after his death, as that night the 12th Aug^t, two of his men who lived in Castle St, (the next street to him) called at my Surgery, both complaining of diarrhoea, and both of them, blamed their attack to the drinking of this same "Spring water." They were both compelled to go to bed, one of them, had a very severe attack, and the debility following it kept him from working for 3 weeks, while the other man's attack was much milder, and he was only off work for three or four days, but both of them said, they would "have no more of that water."

In Volume II of Hilton Jagg's work Pages 167 & 168, it says, "that impure drinking water is a frequent cause of diarrhoea, and that dissolved sewer gasses are certainly known to be capable of causing diarrhoea". He also records a striking instance that occurred in Salford Jail. He says, "that within 4 days 266 out of 406 prisoners were attacked with diarrhoea, whereas none of the officers nor any of the members of their families suffered. The water which the prisoners drank

drank was at once examined and found to have a yellowish colour and an insipid taste. The cause of this was, that the overflow pipe from the cistern led directly into a sewer and conveyed a most foul stench to the cistern which was covered in closely with boards. The water supplied to the officers on the other hand was clear and refreshing. Both waters came from the same source, being merely stored in a separate cisterns."

Again, Professor Glaister in his work on Hygiene 1897 Page 92 says that, "Water contaminated with sewage will produce diarrhoea, and that, not many years ago about 20,000 inhabitants of Hull were more or less affected by reason of ditch water finding its way into the supply reservoir."

Further, B. Arthur Whitelegge in his "Hygiene and Public Health 1899 edition Page 314 says "Drinking water may cause outbreaks of diarrhoea independently of disease."

But,

But, although drinking water may often be the cause of Summer Diarrhoea, the cases from such a cause will only be met with in adults, as it can scarcely be the cause of this disease in young children who drink very little water, or in infants that are either fed wholly at the breast or by feeding bottle. Neither, from what I have said, can milk be ascribed as the cause of Summer Diarrhoea in many adults, as there are large numbers of people that are affected by this disease that drink very little milk, and often the only milk they do drink is mixed with hot tea or coffee which will in a great measure sterilise it. That being so, we must look for another cause, and the cause we must look for must be a general one, or in other words it must be something that all human beings both young and old use. Such a cause I honestly believe will be found in the Air we breathe, and I must say that I look upon Aerial infection as the most potent

cause

cause of Summer Diarrhoea.

III Aerial Infection.

I have said that, during the hot summer months organic matter rapidly undergoes decomposition, we feel that the air we breathe in large towns and cities is close and stuffy as compared with the air out in the open Country. It is that stuffy feeling which the air has that makes the town or city dweller long for a few days at the seaside, or, as it is rightly called a 'change of air'. The benefit from such a change is at once felt, as the air at the seaside or in the Country is clear and bracing, and free from the heavy and curious smell we are accustomed to in the town. Now, what can that stuffiness of the air in the towns or cities be due to? It is due to decayed and decaying organic matter. In most old towns and closely built cities there are old fashioned privy middens into which all manner of filth is thrown, and there

there it lies fermenting and decaying, and poisoning the air with its effluvia. The back courts of the houses in such towns are also mostly unpaved, and if there are any drains they are often worse than useless, because they are usually what are called "rumbling" drains. A "rumbling" drain is a most primitive contrivance, and is intended as a "flush" for the soil. It is made by laying two rows of rough rubble stones, each row being eight or nine inches apart. Larger stones are then laid on the top of these rows, but the bottom of this drain is just the soil, or at most a bit of slate, or a thin flat stone is put in here and there. The sides of such a drain is neither plastered nor puddled with clay. This so called drain is now complete, and is covered up with the soil, but as the joints are all open the drain soon gets choked, and the subsoil becomes saturated with the sewage. That is the sort of drain which is often got when digging up old fashioned unpaved back courts. The

bottoms

bottoms of the old fashioned privies and middens were not paved in any way, so that the subsoil of them got perfectly saturated, and as the faulty drains were choked, the water just got lying until it evaporated. The sides of these middens were built of rough rubble, just like a dry built dyke, and they were very seldom even plastered on the outside. Their position, I suppose for handiness, was as near the door as possible, and apparently, it was not considered at all objectionable if they were built quite up to the kitchen window. The photograph I show on next page is one of these old fashioned receptacles of filth, and I am glad to say, it has during the last few months been removed. It had been built as the photograph shows of rough rubble, and neither plastered nor pointed, in fact one of the sides had given way and the stones had been carried and rolled all over the place by the children, and used for seats when at play, while the soiled paper was lying all

through

through the place.

The bottom of above midden and privy was not paved in any way, and the subsoil must have been saturated to the highest degree.
Breathing the filthy emanations from such a place, loaded as the air must have been with

with putrefactive germs, could in my opinion be quite a fruitful cause of diarrhoea.

The next photograph is rather a curiosity, the basins were not posed for the occasion. I suddenly came upon the scene while they were holding a picnic in the old privy. Chocolate and pieces of rock and bread were lying on the privy seat, while a little girl with a child on her knee was sitting

on the ashbin. How these children were not all poisoned

poisoned is a wonder, but there they were as lively as crickets", but the moment they got their eyes on me they were off. There is an old Scottish saying that, "Peer folk an' beans are no easily poisoned," which seems to be true, for a filthier place for a picnic party it would be hard to get.

Dr. Whitelegge in his "Hygiene and Public Health Page 313. also holds the opinion that such a condition of things is a cause of Epedemic Diarrhoea. He says, that "it is essentially a disease of towns, or, in more general terms of crowded areas, and insteness, density of buildings, want of ventilation and light, caused by narrow back Courts and Streets, back to back houses and overcrowding. He further, says, "Want of cleanliness and foul air from Sewers, cesspools and filth accumulation of any kind, are all causes." And to prove that such conditions cause this disease, he says, at Page 316, that, "Wind tends to reduce diarrhoea mortality, and calm in the diarrhoea season promotes it." He further, affirms, that, "The essential cause of

diarrhoea

diarrhoea resides in the superficial layers of the earth where it is intimately associated with the life processes of some micro-organism not yet isolated. That such organism is capable of getting abroad from its primary habitat the earth and becoming Air borne, fastens upon organic matter which serves as nidus and pabulum."

Even where there are a system of proper drain pipes in connection with houses either old or modern, they are often very defective in their working by not being properly laid, or not properly looked after after being laid. It is quite common for the gully in the back courts to be choked, and the traps of the drains conveying the waste water from the houses is often also choked. The back yard then gets flooded with dirty water, which during the warm weather gives off all manner of bad smells.

That, that is a cause of Summer Diarrhoea is mentioned by Dr West in his Diseases of Children and Infancy page 683. He says, that, "When he was

was physician to the Finsbury dispensary he found that the majority of diarrhoea cases came from the Lambeth and adjoining districts. The reason being that a considerable portion of the district on the Surrey side of the Thames lies below high water mark; and the kitchens and cellars of some of the houses near the river became flooded at unusually high tides. "He also says, that," The Sewage is very defective, and in many parts ~~sewage~~ sewerage is effected by open drains, while in some places there are mere cesspools which have no connection with any drain whatever." and he further affirms that, "the cases of diarrhoea are most numerous and severe whenever these noxious influences are most abundant."

The next photograph is of one of a number of back houses in this town; the buildings are very insanitary, in fact they have been condemned by the Burgh officials. The houses are very damp, and kept very dirty, and it is commoned to see a choked drain there

there

than one doing its work. The people living in the houses are of the very poorest, and I think I could get one or two cases of diarrhoea at any time in these houses, but during August and September I know that disease is always there.

I have said that the old fashioned privy middens so common in the older parts of our towns, may, owing to their faulty construction and contiguity to the dwelling houses – such as is shown

shown in the photographs at page 36— be a fruitful cause of diarrhœal diseases, by contaminating the air and the subsoil, and of that there can be no doubt. But the more modern watercloset which all sanitarians insist upon as being the correct kind of convenience, may be just as dangerous a nuisance, if, as often happens the tenants of the houses are careless. Every conceivable thing is sometimes thrown into the basin of these waterclosets, such as old bottles, pieces of wood, cinders, old hats, old clothes and books, with the result that they get choked up and unworkable. The floor also is often soiled by children, and, I am sorry to say it, often by adults as well. And as if that was not enough, the whole apparatus is sometimes wantonly destroyed, so that the nuisance created is just as bad as what would be got by the old fashioned midden.

The next photograph illustrates what I have

have been saying. The seat was torn off and you will notice that the water pipe has been smashed out flat. It was also literally filled with rubbish which is shown lying on the floor. I may mention that this water closet was only erected two months before this happened.

Pigstys are not now so common in the back courts of town houses as they used to be, but they are still a few. This photograph shows about the last in this town, and it has got its "warning." They are certainly a nuisance, and may easily be the cause of disease, as it is scarcely possible to keep a pigsty of the old fashioned kind in anything like a clean state.

During the summer months also the streets and all our towns and cities are more or less covered with

with a layer of dust, and the busier and more thriving the town is the thicker that layer of dust will be. That dust is composed of all manner of refuse in a state of active putrescence, and its most abundant constituent as a rule is the pulverised droppings of horses and cattle. Now, these droppings during the Summer months dry quickly, and during the drying process the effluvia evaporates into the air. After evaporation pulverisation is easy; then the lighter particles are borne up and held in suspension in the air, with the result that, both young and old amongst us when breathing, take into our lungs, Air plus effluvia and the suspended particles of that putrid stuff with which the air is loaded. Will that not be quite a sufficient cause to bring on an attack of Summer Diarrhoea in many people? I think so, and I am all the more convinced of it, from the fact that, this disease is more prevalent in large manufacturing towns and cities during the late Summer and early Autumn months.

Or

Dr. Parkes in his Hygiene and Public Health, 1897 Edition, page 232 very strongly mentions as a cause of diarrhoea what I have just said. He says, "Diarrhoea is often caused by breathing air contaminated with excretal emanations". Further, he says, that, "Dr Tomkins, found that in Leicester in those districts of the borough where diarrhoea is most prevalent, the air is most contaminated with microbes or their germs or spores, and those microbes when artificially cultivated, possess the power of inducing diarrhoea in the human subject."

IV Insects,

As a factor - and a very important one perhaps - in the causation of Summer diarrhoea, insects I think cannot be overlooked, as during the months that this disease is most prevalent, insect life is at its meridian, and the great abundance of putrid material lying about provides a perfect storehouse of nourishing material for them. During the late Summer and early Autumn months our living rooms are usually so close and warm that

that the windows have to be opened to admit air, but the open windows also admit large numbers of insects direct from their feeding grounds, and that feeding ground is usually in the very filthiest of decayed and decaying organic matter, and no better feeding ground can they get than in the old fashioned privy middens previously referred to, as well as the decaying offal lying in our Streets. The legs and bodies of the insects must be covered with small particles of the filthy stuff, and when they alight upon our bodies or our food stuffs some of the filthy matter must be left on it. May that not also be a very potent cause of Summer Diarrhoea? I think it is perhaps one of the most probable causes.

During the late war in South Africa the insect theory has been greatly talked about as causing the spread of Enteric fever and dysentery amongst the troops, and a very likely cause I think, it is. As recently as the 30th September last, I saw in the "Glasgow Record and Daily Mail" the report of a

coroners

Coroners jury at Portsmouth, which had been enquiring into the cause of an epidemic of dysentry which had been "raging" in a portion of the town in which lie a number of heaps of house refuse, and it says that, "The jury found that Victor William Herbert, aged five, died from dysentry caused by disease germs that were brought by flies from the refuse heaps into the houses and there deposited upon the food. In a few days the boys parents have lost three children, and a fourth is ill".

I could not find a report of above in the medical journals, but it certainly was given in the newspaper on the 30th Sept last and suppose it will be perfectly correct.

Now, I am sure no one will deny that Summer Diarrhœa is a serious disease and deserves more attention that it has perhaps got. It is undoubtedly a filth disease, therefore it is a preventable one, and Sanitarians, can I think lessen its ravages very much by altering as

far

for as they can the conditions under which the people live, especially in the older and poorer parts of our large towns.

I am quite aware that old customs die hard, and the only way to get improvements is to initiate them piece-meal, as if one attempts too much at a time his efforts are apt to end in nothing being done. Almost every Autumn for many years back, Paisley has been visited by Enteric fever which in some of the years reached epidemic magnitude, and Summer Diarrhœa was usually very rife in the town at the same seasons. All manner of things were assigned as causes, but very little benefit was got, as there were more talking by the members of the Local Authority than actual doing. In the Autumn of 1898 the town was visited by an epidemic of Enteric fever of rather a malignant type, which caused a large number of deaths, Diarrhœa, too was also very prevalent at the same time. The towns water supply and the dead-end pipes, and flushing the sewers direct from the

Water

Water mains was given as the cause by some, so Professor Percy Frankland was sent for to take samples of the Water for bacteriological examination. Dr Buchanan of Glasgow also got samples, and both of these gentlemen afterwards reported that the Water might be the cause, by sewage finding its way into the Water by the method of flushing in use, and by the dead end pipes, founding that opinion upon the number of Bacillus Coli Communis which they found the Water to contain. But there might have been any number of Bac: Coli Com: in the water before it went into the supply pipes at all, and I am certain that was the case then, and I am certain they could get them now, and perhaps in greater numbers than they were got in 1898. They were not aware I think that the whole catchment area of the water which they examined was extensively used for grazing sheep, horses and cattle, and also that a very large portion of that area, was a veritable Rabbit Warren. That, in my opinion would account for the presence of the Bac: Coli Com:

in

in the water, as the droppings from these animals contain that bacillus in large numbers, and the water therefore must contain them, and all the more especially as it was not too well filtered. Neither were these gentlemen aware, I am afraid, that the water pipes were in most places of the town as much as 10 and 12 feet above the main sewer, and although the sewer was flushed direct from the mains, it was I submit impossible for sewage to get into the water pipe as the pressure of the water in the mains was 90 lbs to the square inch. The scouring pipe was also fitted on the top of the sewer, so that it could not possibly touch the sewage.

The theory of stagnation in the dead ends was in my opinion also groundless, we could not do away with dead ends, and if we did, we would have to do away with every water tap in all the houses, as every tap when not in use is a dead end.

Mr Gales, the Glasgow Corporation Water Engineer was

was requested to examine, and report on the system of water piping in their relation to the Sewers, and the Scouring arrangement. He reported in favour of the arrangement in use, and it was, he said, the very same as was in Glasgow; and had he maintained nothing to do with the epidemic.

By this time our Burgh officials had quarrelled amongst themselves, our Medical Officer of Health, who was a part time man resigned, and things generally got to a regular mess indeed, but while the officials were all at sixes and sevens, the fever rose itself out, and has not since returned in anything like an epidemic form, although the dead end pipes and the Sewer scouring arrangements remain as before.

Although the water pipes were not altered, the whole question being discussed so freely, caused attention to the water filters, and I am inclined to think that really was the proper thing, the result of the investigations being, that a few new filters were made, so that now the water

is not only much better filtered than it was at that time, but the rate of filtration is much less. I never believed in the Water theory as causing neither the Enteric fever nor the Diarrhoea. I considered them, and I considered still, that the real cause was the defective Sanitary Areas. At that time old crumbling drains were unearthed that were not previously known to exist, and where these drains came from or where they went to nobody knew or could find out. But there is one thing certain, and that is, that the fever began where these old drains were found to be, and one such drain was got under the Kitchen floor (I should have said Hearth under the floor) of a house in Hele Street where two cases of Enteric were.

At this time – November 1898 – I was induced by a deputation of electors to contest one of the Wards, which I did, and was successful in being returned as a Member of the Town Council.

I became a Member of the Public Health Committee

Committee, and began at once to suggest some alterations and improvements, as I was convinced good might result if greater care was taken by our Sanitary department. But it is only when one begins to try to make alterations, that we become aware how hard a job it is to alter old habits and methods, and this one instance will clearly show that. For years it was the custom to sweep the streets at night with the sweeping machine, but no: body seems to have considered it was necessary to water the street before the sweeper went over it, because it was done at night. The result was that great clouds of irritating dust was raised which found its way into our houses and sleeping apartments, and into the shops. all along its route, of course when it got into the shops it fell on to the goods, and if these goods were food stuffs, a fine mess it made, for be being highly dangerous to the Consumer.

I moved in the Public Health Committee, that we instruct our inspector of cleansing to send the

the water cart to spray water on the street before the sweeping machine, that simple thing was strongly opposed even by the then Convener, and as our printed minutes show, it was only granted after a division which almost smashed the effort to give the method a months trial. I am glad however to say that when the month was up, no one was bold enough to suggest going back to the old method, as the change for the better was so apparent. Since then the water cart always precedes the sweeper.

As I have said the Medical Officer of Health had resigned owing to the fever dispute, so I thought it was now our duty to have an officer to devote his whole time to the duty of Health, and moved accordingly. That motion met with great opposition, and was referred to one Committee after another for months, but finally I gained my point and a Medical Officer of Health was appointed at a salary of £400 a year to take charge of the health department and nothing else.

about

About a year after that I moved that we frame byelaws to compel the landlords to have all the back courts properly drained and paved. At this time very few of the back courts in the town were paved, so that as a rule they were both damp and filthy. The byelaws were framed, and confirmed by the Sheriff and Local Government Board, and the result is, that now most of the back Courts in the town are properly drained and paved with Granolithic, and a Squad of men are employed in doing nothing else but sweeping them.

For some years previous to this, our Sanitary Department had been gradually condemning the old fashioned privies and Middens, and insisting upon dust bins and the pail system of privies. But, in 1890 when I became convener of the Public Health Department, I got a motion passed to do away entirely with these privies in the western part of the town, and to insist upon the erection of Water closets in the landings of each tenement. That is now being carried out, and very few

privies

privies now remain in that part of the town.
The other end of the town will be tackled very soon.
Cesspools have all been abolished, so that all the
soil is now drained into the sewers.
These changes should I think, all tend towards
the lessening of both Enteric fever and Diarrhoea,
but, although we may not reach the high standard
of immunity which Aberdeen has, we still will
gain something, and, with the increased power
and "Say," which I now have, not only as Convener
of the department having charge of such matters,
but as a Magistrate of the Burgh, I will do all
I can to make the town show its "paces."

I have referred to what we are doing in
Paisley, because I am more intimately connected
with that town, and I have no doubt but before
long both Summer Diarrhoea and Enteric fever
will be greatly lessened.

We know as a fact that putrefactive
changes take place quicker when the weather
is hot and dry; we also know that the effluvia

to

is felt most, and that the dust rises most during dry weather. We also know that moisture will prevent the dust rising, and everyone has felt the difference in the smell and the "feel" of the air after a shower of rain in a hot summer day. These points being admitted, the remedy is, I think clearly indicated, and I would suggest the following as likely to be at least a help in the prevention of Summer Diarrhœa.

I All privy middens should be totally abolished in all towns. They are receptacles of filth, and, therefore, can never be kept clean no matter how they may be constructed, or how often they may be emptied.

II All back courts should be properly drained and paved, regularly watered and swept.

III The tenants of all tenements should be compelled to wash the closets and stairs, and landings.

landings, twice a week, and the landlords should be compelled to have the walls of the closes, stairs and landings lime washed once every year. (Paisley has such a bye law, the observance of which is being insisted upon.)

IV The sheets during the hot weather should be frequently watered and swept during the daytime, and the water cart should always precede the sweeping machine. The moisture would keep the filth laden dust from rising, and so, we would have a chance of at least breathing a fairly pure air.

V All the traps connected with the waste water pipes of all tenements ought to be regularly examined as to their efficiency. It is not good sanitation to allow these traps to remain unheeded until they speak out themselves by overflowing, and deluging the back courts and pavements with foul smelling sewage.

VI The main sewers should be well ventilated and properly flushed from different places all along their course, so that, during dry weather when the sewage is therefore more concentrated, there would be less chance of stagnation, more especially where the "fall" was not very great.

I have mentioned what I consider likely causes of Summer Diarrhœa, and I have indicated how they may be rectified, and, if Local Authorities would only take the same ~~the same~~ view, my opinion is, that the disease would soon be very greatly lessened.

In conclusion I may say — although I don't remember having seen it mentioned before — that there may be a more or less intimate connection between Summer Diarrhœa and Enteric Fever. Enteric Fever like Summer Diarrhœa, prevails most in the Autumn after a hot and dry Summer, and I have often noted that, if there were many cases of Summer Diarrhœa in any particular locality

locality, there would certainly very soon be a number of cases of Enteric Fever in that same locality, and vice versa. Further, I have noted, that, when Summer Diarrhoea ceases, Enteric Fever is just at its worst, but I don't remember to have come across a person taking Enteric Fever that had, had an attack of Summer Diarrhoea that same summer. I have attended several people in the one house with typical Summer Diarrhoea, and within a week or two other members of the family sickened and developed pure Enteric Fever. I have further, noted that, those members of the family that had, had the Diarrhoea, escaped taking Enteric Fever. Can there be a connection between the two diseases, or are the facts I have mentioned only a coincidence. ? Can it be possible that Summer Diarrhoea may be mild or abortive Enteric Fever, under going a process of elaboration and maturation, and finally developing into pure and unmistakable Enteric Fever. ? I cannot say, but I am of

opinion

opinion that this subject is one worth careful consideration and study.

What I do know to be a fact is, that Summer Diarrhoea is often mistaken for, and labelled as Enteric Fever, and, if such a patient is taken to the hospital, as his attack soon ends, he is blamed for having had "Ambulatory" Enteric, and for going about with the fever on him before the diarrhoea began.

That I know to be the case, because two years ago I got liberty from the Town Council to set up a fully equipped Bacteriological laboratory. When it was finished, Circulars were sent to all the Medical practitioners in the town informing them that, by applying to the Medical Officer of Health's office, they would get Sterilised Capillary tubes for collecting the blood of any cases they might have of suspected Enteric Fever, and the department would apply the Widal test to the blood if they sent the tube back to the Office, and a report would be sent them. Sterilised Swabs for the throat

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are also supplied, and suspected sputa is examined for the Tubercle Bacillus, and reports sent back, all free. Now it is quite common for samples of blood to be examined, which have been collected from patients having fever and diarrhoea, and which do not react to the Widal test. Further, it is a rule that the blood of every patient admitted to the Burgh Infectious Diseases Hospital (as suffering from Enteric Fever) is subjected to the Widal test, and it often happens that it does not react, the patient getting better in a few days. If the blood had not been examined, all the cases would have been labelled Enteric, which would have been a hardship on the patient and a charge for upkeep to the town which is now saved.

In the foregoing pages I have tried to indicate what I consider to be the cause of Summer Diarrhoea, and how that disease may be greatly lessened by

by the removal of such causes, and hope that you may consider my effort sufficient and worthy for the purpose for which it is written.

I certify that all the foregoing has been written by my own hand.

William Russell. M.B.C.M. D.P.H.
52 High Street,
Paisley.

22nd December 1902.