1880-81 Hutchinson

A Sporadic Case of Enteric Fever occurring in a Remote District in the Western Highlands.

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Authors Consulted.
Murchison — Budd. — Reynolds System of Medicine. Sir Thomas Watson. Tanner

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Although enteric fever is described as a disease endemic in Great Britain, it is not one of the diseases that are of most frequent occurrence in the West Highlands of Scotland, more especially in the more remote and out of the way districts.

The district of Arisaig in which I have been Parochial Medical Officer since my graduation, is a part of the Parish of Ardnamurchan. It is in the County of Inverness, & is situated on the seaboard. The Village is very small, consisting of not more than two or three dozen houses. The nearest village of any pretensions is Fort William, forty miles off, & the only communication is by Post Bag three times a week. The country round about Arisaig is wild and very thinly populated. The people are principally small farmers, shepherds, or fishermen. The

small farmers, or crofters as they are called, trust almost entirely to the few acres of land attached to their houses for their daily bread. The shepherds are in receipt of a salary, which is as a rule not very comprehensible, & the fishermen earn a precarious livelihood on the water. The principal articles of diet are tea & potatoes. Salt meat is an occasional dainty, or perhaps braxy, i.e. mutton that has been found dead on the hill. Fresh meat is a rarity, even in Summer. While the herring are in season, they take the place of salt meat, but tea is the mainstay. The days of the Highland reivers are gone by, when the people lived on the cattle stolen on their marauding expeditions, & when the salmon & trout in the rivers were plentiful, & fishing unrestricted. The houses are exceedingly primitive in construction, and are

totally devoid of any architectural display. They are principally "black huts" formed of four walls & a covering of thatch. There is no chimney, but merely a hole in the thatch to let out the smoke and let in the air. Some houses are divided into two rooms by a division in the centre, but there are never more than two rooms. As a rule they are innocent of any sanitary arrangements. The floor is formed of the bare ground. There are no fire places, but merely a few slabs of stone placed at the side of the wall on which to lay the peats. On account of the want of chimneys the smoke permeates all through the dwelling and finds egress by door windows &c. When one enters such a house nothing is to be seen except perhaps the glow of the fire, gradually however the eyes become accustomed to the smoke & then the various

contents of the room become visible.

About ten or fifteen years ago, there were two tenements of houses built in the village. They certainly were a marked improvement on the black huts before mentioned, but they did not by any means realise what was expected. Strange to say water closets, or privies were totally forgotten, consequently the ground at the back of the house, for a distance of a few dozen yards, is not at all what it ought to be. These tenements are supplied with the veriest apology for drains. One drain runs past the front of the house and another past the back. That at the front merely gives passage to a small burn that comes down from the hill. This drain does not often get stopped up as the water runs with considerable force. The drain at the back of the house is where all

the refuse water, that has been used for household purposes is thrown. Every now & again it gets stopped up, & stopped up it is allowed to remain, the people being either too lazy or too careless to put it to rights. In the kitchens of these houses were placed sinks, but most of these sinks have long ere this become impermeable and so they have been allowed to remain.

Of late years however a few houses of a rather better class have been built around the village. In these houses there is much more attention paid to the sanitary arrangements and a much greater approach both to cleanliness & comfort than was possible either in the tenements above mentioned or in the black huts.

Of course the above remarks apply almost exclusively to the smaller class of farmers, shep-

herds & fishermen. The better class of farmers the number of whom is comparatively small occupy houses more in accordance with modern ideas. Notwithstanding all these drawbacks as regards cleanliness & comfort highlanders are a remarkably healthy race. They are also very long lived. They are especially free from diseases which tend to assume an epidemic form. It is nothing unusual for the people here to live considerably beyond the allotted span of three score & ten.
On looking over the Register of Deaths for the last ten years I found that,
of deaths under one year there were 13

over	1 Year & under 5 = 8
5	10 = 6
10	20 = 6
20	30 = 22
30	40 = 11
40	50 = 8
50	60 = 11

Deaths over 60 & under	70	=	10
	80	=	19
	90	=	23
	95	=	7
	100	=	5
		=	1

Thus it will be seen that the greatest number took place between the ages of 80 & 90. There was one person registered as being ~~over~~ 107 years when he died, but this was the only centenarian. The next greatest number took place between the ages of 20 & 30. Not a few also lived to between 90 & 100. Deaths among children are far from common & when they do occur it is usually at a very tender age, oftenest between birth & 6 months. During this period of ten years I observed one death registered as having been due to enteric fever, another as having been due to measles & another as having been due to

scarlet fever. These three were the only examples of death resulting from contagious diseases.
The principal diseases & types of disease that I have met here, are lung complaints and bowel complaints. The lung complaints are due to their modes of life and to their occupations, causing them to be exposed to all weathers without much shelter and often but scantily clad. Of the ~~lung~~ diseases of the lungs, bronchitis is the most common, but phthisis is far from rare. The bowel complaints are seldom serious. Constipation is most frequently met with. They are usually brought about by indiscretions in diet and usually give way to simple remedies.

The following case of Enteric Fever occurred in my practice in September last and was interesting to me not so much on

account of the symptoms it presented, but because it offered unusual advantages for the investigation of its probable cause.
Early in September 1879 Jane McEgglen aged 11 years residing at Skaith, Anisay, called at my house. She was accompanied by her father. She was very disinclined to say much about herself, but her father told me that for the last few days back, she had appeared listless & disinclined for ~~work~~ play. She principally sat crooning over the fire, complaining of feeling cold, and chilly. This was quite contrary to her usual habits as she was a lively girl. Her appetite was almost gone and she complained of headache. Her tongue was furred and her bowels constipated. I did not take the temperature at that time, but on feeling ~~her~~ the skin with my hand it did not seem to be abnormally warm. Her pulse

was regular, full, and not abnormally fast. I ordered her a gentle laxative, and asked her father to let me know how she progressed. In a few days her father came to me asking me to go and see her, as since he had brought her to me she had taken to her bed. She had also become very feverish, more especially at night. On going to the house, I found her up in bed, lying on her back. She was very drowsy & with a languid but not unintelligent expression. She complained of headache, which was chiefly frontal, loss of appetite and thirst. On her cheeks was a circumscribed pink flush, reminding me of that seen in hectic fever, and advanced stages of phthisis. Her tongue was coated with a white fur which was confined to the centre of the organ, leaving the tip and edges free, & red. The pupils were de-

labed, bu asking after the stake of her bowels I was told that they were very constipated. The laxative I ordered not having been given. She had had no motion for three days. The skin was hot, and dry and on taking the temperature with the thermometer, I found it to be 102° F. The pulse was full, and slightly resistant, and beat about 100 times per minute. She made no complaint of abdominal pain, except when I pressed with considerable firmness over the region of the liver. The abdomen was not distended, and there were no spots to be seen on the surface. Next morning the symptoms were much the same, with the exception of the temperature not being quite so high or the pulse quite ~~so~~ so fast. She seemed to have ~~slept~~ slept soundly all night. There had still

nothing come through the bowels. The Castor oil I ordered the evening before had been vomited. The parents gave it again, but that also was rejected. This was the only vomiting that occurred through out the case. As the castor oil would not lie on the stomach, I ordered rhubarb in the form of pill. The first pill did not act, & another was given about eight hours after. The bowels acted after this second pill. The faeces were very dark in the colour & considerable in amount. This was on the third day after she had taken to her bed. The temperature was still high, and the pulse still fast. At this time I took the temperature both in the morning and evening, and I found that there was a considerable difference between them. The temperature was higher in the evening, than it was in the morning by about 2° F. The pulse also, varied with

the temperature. It increased in rapidity towards evening, and fell away again towards morning. Temperature 103°.7 in the evening, 101.2° in the morning. Pulse 110 in the evening, 100 in the morning. The flush on the cheeks, also was most marked towards evening, & also after taking food. She was not very prostrate, but exceedingly drowsy. After the bowels were moved they continued relaxed, and the stools soon took on the appearances met with in enteric fever. At this time she always got up out of bed to go to stool. The above symptoms continued much the same during the first week. Of course there was a trifling variation between the temperature of one evening compared with that of another. I carefully examined the surface of the abdomen every day and about the 7th or 8th day

found the rose coloured, lenticular spots, which are characteristic of enteric fever. They were small rounded and regular and their margin was well defined. They were slightly elevated above the surface of the skin, & their surface was ~~well defined~~ rounded & convex. About this time gurgling was to be felt in the right iliac fossa when pressure was made suddenly. There was not much abdominal pain. The abdomen was very slightly swollen. During the course of the second week her condition was as follows. Tongue moist, and furred down the centre. It gradually became more and more dry and covered with a thick brown crust. This crust soon began to crack transversely. The tip and edges of the organ were red. The throat was painful, and swallowing was exceedingly

difficult. This pain & difficulty of swallowing was due to dryness of the throat. She was still very drowsy, sleeping or dozing both night and day. When roused however she gave intelligent answers to questions. Towards evening delirium came on. This delirium was always of a quiet kind. The mind wandering from one subject to another. The pupils were dilated and the cheeks flushed. Sordes began to accumulate about the lips, and teeth. The patient also ~~~~ became very deaf. This deafness was worse on one side than on the other. The left side was the one most affected. The bowels continued loose, but the motions were never copious, or very frequent At this time they were typical enteric stools of a yellow ochrey colour, with a faint,

peculiar, alkaline odour, and of a watery consistence. On reaction they were alkaline. After standing some time the stool seperated into two layers. The upper layer consisted of fluid of a pale brown colour, the lower was of firmer consistence, and seemed to be made up of undigested food, faecal matter &c. The urine was scanty & of a high colour. On standing some time a copious deposit of urates came down. Over the surface of the abdomen were to be seen the rose coloured spots in all stages of retrogression. One crop usually lasted for a few days, before it finally disappeared. The rash however was never copious. The abdomen was swollen, but the retension was never considerable. The distension was peculiar, the convexity being chiefly from side to side due

to the flatus being contained in the colon. Pain, and gurgling in the right iliac fossa were also present. The temperature was high, especially towards evening and the pulse was rapid, and not quite so full, and strong as during the first week. At this time the morning remissions, and evening exacerbations of the temperature were not so marked, and between the temperature in the morning, & that in the evening there was little difference.
Evening temperature 105° F.
Morning temperature 104·5° F.
The pulse was very rapid, small, and feeble — 120 per minute.
The above was her condition during the latter part of the second week and up on to the middle of the ~~three~~ third week.
The prostration was great.
About the middle of the third

week it was noticed that the temperature was not so high towards evening, also that the morning remission was greater. The motions also were not so frequent. The urine became more copious and of a paler colour. The motions about this time became of a firmer consistence, and more natural in colour. The pulse though very weak was not so fast. After this her symptoms all improved; the drowsiness to wear away, and the delirium to cease at night. The rash on the abdomen ceased to appear, & between the 21st & 23d days slight perspiration was noticed. After the perspiration sudamina were observed all over the body but principally on the chest and abdomen. Soon after this the skin began to peel off. During the third week there was a slight amount of bronchitis present, but it wore off gradually as convalescence progressed.

At the beginning of the fourth week, from the time she took to her bed, she began to convalesce. The temperature at night was normal and the pulse though weak was not so rapid. The appetite began to return and altogether she was progressing favourably. A relapse took place after she had convalesced for about ten days. The pulse and temperature rose, and there was a return of the diarrhoea. This relapse did not last more than six, or seven days, and after that, she made a good recovery.

Specific Lesion

The specific lesion in Enteric Fever, is set down in books, as ulceration of the solitary, and agminated glands in the small intestine. These ulcers are distinguished from all other ulcers occurring in that region, by the following characters. They are invariably situated in the lower third of the

ileum, and increase in size, and number, as they approach the ileo-caecal valve. Their size varies from a line, to a line and a half, in diameter. If the ulcer is larger than this, several small ulcers have become joined together. In shape they vary according as the ulcer is formed of a complete Peyer's Patch, or of a solitary gland, or of several ulcers joined into one. If the ulcer is formed of a complete Peyer's Patch it is elliptical in shape. If formed of a solitary gland it is circular. If of several ulcers joined together or of only a part of a Peyers Patch it is irregular in shape. The depth of the ulcer is usually slight, the floor being formed by the sub-mucous tissue, the muscular fibres of the bowel or the peritoneum, according to the extent of the ulceration. If the ulcer is elliptical its situation is opposite to the mesentery and its long axis corresponds with

the long axis of the bowel. If however several small ulcers join together, the long axis of the whole mass of ulceration may be transverse. This is oftenest seen in the colon.
The edges of the ulcer are formed by a fringe of mucous membrane which is seperated from the submucous tissue to the extent of about a line. This fringe is of a purple or slatey gray colour. The edges of the ulcer never become hard and indurated.

The stage of ulceration is preceeded by two other stages. In the first stage the agminated, and solitary glands are enlarged. This enlargement is due to a proliferation of the lymph corpuscles, and the corpuscles of the connective tissue of the gland. The mucous membrane covering the patch is of a pinkish grey or purple colour, and the peritoneum on the other side is

injected. According to the severity of this proliferation, the disease is called plagues molles, or plagues dures. In the plagues molles, the gland is of a comparatively soft consistence, and the enlargement comparatively slight. The mucous membrane touching it is more or less red, and its surface looks as if it were raised into rugae. In the plagues dures, the enlargement is greater, the consistence harder, and the mucous membrane paler and smoother.

This proliferation of the corpuscles may stop short, and the morbid products become absorbed again, before ulceration comes on. When ulceration does happen it is as follows. Either the softened mucous membrane becomes abraded, and this abrasion increases in size owing to the molecular death of its edges & floor

or the whole of the morbid material, including the mucous membrane, covering the gland may be detached in the form of a slough. The latter is said to be the more common mode. The peritoneum may also be involved in this slough, and perforation of the bowel take place. In such a case, the opening would be large. Perforation may also take place by extension of the ulcerative process right through all the coats of the bowel, including the peritoneum. In such a case, the opening in the bowel would be small. Some authors state that rupture of the peritoneum, after it has been denuded by the ulcerative process, may happen. This mode of perforation is denied by others. Should the disease stop short of perforation and cicatrisation take place the resulting cicatrix is formed by a layer of gran-

ulation tissue coating the surface of the ulcer. This layer of granulation tissue is wedged in between the fringe of mucous membrane forming the edges of the ulcer, & the muscular coat of the bowel forming the base. At first the cicatrix is firm, and bound down, but afterwards it becomes slidable. It is "slightly depressed, firmer, & less vascular than the surrounding mucous membrane". It seems to have no tendency to contract, as it never causes any diminution in the calibre of the bowel. The solitary glands in the colon are sometimes enlarged and ulcerated, but as a rule the disease is confined to the caecum, and ascending colon.

I have in the above tried to give a short account of the lesions in the bowel, which pathologists tell us are characteristic of Enteric Fever. Happily in

this case which forms the subject of this thesis, I was prevented from verifying them in my own experience as the patient made a good recovery.

Treatment

The treatment I adopted throughout the case was very simple. At the commencement of the disease while the bowels were constipated I ordered castor oil. It was administered twice but was vomited both times. Then rhubarb in the form of pill was given which had the desired effect of relaxing the bowels. Strict confinement to bed was enforced, and when the temperature began to assume febrile altitudes the diet was confined to milk, the quantity of which was not stinted. The patient however, never partook very largely, on account of the pain in the throat. As the

diarrhoea was at no time excessive I was not very officious. I gave pulv specac co, & Hyd c cret, but the effect was not very marked. As the patient never complained of pain in the abdomen, I did not apply any fomentations or turpentine stupes but merely directed a roll of flannel to be wound round the abdomen. During the typhoid stage, when the pulse began to flag stimulants were given. Two teaspoonfuls of sherry wine were administered every two hours. This was all the treatment adopted. When the temperature was at 105° I would have liked to have tried the wet pack, or cold affusion, but as I could not attend to it myself, and as no reliable nurse was to be had in the village, I was obliged to leave it alone. After convalescence

set in tonics, and careful regulation of the diet, was the treatment adopted.

Of the causation of Enteric Fever much has been written and much discussion has taken place as to the particular cause of particular epidemics. Of the predisposing causes of the disease, there is not much to be said. The disease attacks one sex as readily as it does the other, but it has been noticed universally, that it is during youth, and adolescence that it usually makes its onset. Cases are on record of the disease being ~~contracted~~ at a very tender age. There have also been reported cases in which ~~cases~~ people considerably advanced in years have been laid low. The season of the year has something to do with the causation of the disease. The disorder being much more prevalent at the end of summer

and the beginning of Autumn, than at any other period. It is usually more prevalent too after Summers that have been remarkable for their heat and dryness, than after those that have been cold and wet.

It is agreed by all observers that overcrowding and deficient ventilation, have little or nothing to do with the causation of the disease and that the wealthy living in large well ventilated houses, are no more secure against an attack of the disease, than are those living in the most squalid poverty. Neither does the disease have any preference for those that are broken down in health.

Of the exciting causes of the disease more is to be said. That it may arise from contagion is admitted, but there is still a difference of opinion as to the

precise place which this element takes, in the production of particular epidemics. When the disease is transmitted by contagion it is through the stools of a person ~~already~~ suffering from the complaint, and through the stools only. But whether there is a specific virus given off in the alvine dejections, or whether the poison has become developed in the excreta, after they have been passed, is still sub judice. That epidemics have been traced to milk, and drinking water, that has been poisoned by the emanations from a typhoid patient, is now no longer questioned. The stools may have been thrown into a cesspool, the water of which has filtered through the soil into a neighbouring well. This well may have been the place where that people took their drinking

water from, or the water of the well may have been used for washing milk cans, & so the disease may be spread. The complaint may also be transmitted by the clothes, and bedding of the patient, in this wise by some of the excrement being discharged into the bedclothes.

There has been much discussion among the profession, as to the independent origin of Enteric fever, and theorists have not been wanting to bring forward their pet hypotheses. It is not my purpose in this paper to enter into a discussion as to which theory is the correct one in all cases; my professional experience is as yet too limited. I will merely state the theories, which receive the most acceptance among medical men, at the present day. Then give my views as to the causation

of this particular case, and see which theory will best take in all its facts.

Dr Murchison puts forward the theory that Enteric Fever is always the result of poisoning of the air, or water with the products of putrefying organic matter. That it may be transmitted by the stools of a patient already suffering from the disease he does not doubt, as he says that the stools of Enteric fever, are more prone than ordinary sewage, to the specific fermentation. But he holds that it is not until the dejections undergo putrefaction that they become poisonous. ~~That~~ This poison is always the result of putrefaction. That there is a specific virus contained in the stools he denies, and he states that fresh stools are harmless; that the poison

becomes generated in them only during their decomposition. He says that "persons are exposed to Enteric stools in their most virulent condition, but decomposing is excluded, and yet no fever results. That Enteric Fever is constantly appearing where decomposing sewage is present, but where every effort fails to trace the presence of Typhoid stools."

Dr Budd says that there is a specific virus contained in the evacuations from a patient suffering from the disease. He says "that what is cast off by the bowels is incomparably more virulent than anything else". That "the sewer is the direct continuation of the diseased intestine". "Fermentation & decomposition" he says "act as the great instruments of the softening & disintegration of the organic matters, and

probably has the principal hand in hastening the extrication and liberation of the germs in which the infective process resides. The gasses which are so abundantly given off in this process still further help by carrying these germs with them, to further diffusion of the contagious matter."
"The poison" he says "is contained in the sloughs which are cast off from the bowel, or in the yellow matter which is gradually pelted away from the ulcers".

Dr. J. L. Bryden in one of the reports of the sanitary Commission for India puts forward another theory. He thinks "that the specific lesion, and the attendant fever are capable of development without the application to the system of a poison elaborated elsewhere.

In the particular case

which forms the subject of this thesis I searched diligently to find evidences of contagion &. I enquired into the water supply, and found that all the water ~~was~~ used in the house was carried from a well a considerable distance off, & that there were no drains, or cesspools near it. The milk supply also, I found would bear the most rigorous inspection. The inmates of the farm house from which the milk was obtained, all enjoyed the best of health. The water too, which was used for household purposes on that farm could not be suspected of being polluted as there were no drains, or cesspools in the neighbourhood. The water came from the hill. Of contagion from one already suffering from the disease I failed to find the very slightest evidence. There were absolutely no cases of Enteric Fever in the

village at that time, and I could not find traces of any one having come into the village, from a distance, who was even suspected to be labouring under the disease.

The patient lived in one of the tenements before mentioned. I have also spoken of the drainage system in these tenements in a previous page. Inquiring then after the condition of the drains at the time my patient was labouring under the disease, and also of the condition it was in for some time before that, I found what I thought was a clue to the probable cause of the disease. The drain which runs along the back of the tenement, & which is used for throwing all the water that has been used for household purposes, is almost superficial. It has an opening at the door of each house in the tenement.

The drain which runs past the front of the house is occupied exclusively by a small burn that comes down from the hill. I learned that it was not at all unusual for the drain at the back of the house to become choked, and to remain in that condition for some time before any of the people ever thought of getting it set to rights. In the Kitchens of most of these houses were placed sinks, but these not long after they were put in got choked up & in that condition most of them remain. Now for some time before my patient was taken ill, this drain at the back of the house was not in working order, and of course its contents consisting principally of organic matter were in a state of stagnation and also confined in a limited space, this

affording the very best chances for decomposition and fermentation.

After excluding all poisoning of the water ~~&~~ or milk and finding no evidences of contagion from one already suffering from the disease I was forced to the conclusion that poisoning of the air by the decomposing organic matter contained in the drain had something if not everything to do with the disease in this case.

I say again that my professional experience is ~~not~~ too limited to ~~all~~ warrant me giving an opinion as to which theory will embrace all the facts of ~~the case~~ every case of Enteric Fever. Whether every case of Typhoid fever no matter where it occurs may be

traced to decomposing organic matter & decomposing organic ~~also~~ matter alone I will not say. But certainly in this case all the evidence is in favour of the Pythogenic Theory & none in favour of the Contagion Theory.

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Thesis for MD

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