

ENTERIC FEVER—THE WATER-BORNE THEORY.

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As Major Norman Faichnie's very interesting paper on the water-borne origin of enteric fever, in the May number of our Journal for 1906, has not drawn forth the protests that might have been expected, with the exception of Surgeon-General Quill's decisive remarks on the Ceylon outbreak amongst the Boer prisoners of war, may I offer a few criticisms?

His first point is a comparison of *Indian with English barracks*, in favour of the former. This is rather a "tall order." I think that most officers who have been in India have seen some very "essential differences," *e.g.*, to mention only a few, the ground all about Indian barracks is polluted by human and animal excrement; I have seen the native cook urinating outside the kitchen. Has any one seen the soldier using the barrack square in England as a latrine? Or do the contractors and followers in England relieve themselves round the first corner, as is done every day out here (India)? In England the latrines are "flushed about four times a day." How often here? Has anybody seen at home anything like the clouds of dust whirling round inside the latrine which we see here? Is it possible to see no difference between an English and an Indian kitchen; the native cook squatting in the dust before a table two inches high, holding the meat or the knife between his toes? And his dusters! In an officers' mess cook-house recently I found they had only three dusters for the day; two of them would make a decent ink; the third was a little whiter, so that, alas! its original sphere could be seen; it was the tail of a shirt!! Of course the officers had enteric fever, but the problem was not how they got it, but how some of them escaped.

Camps.—Under this heading it is rather feeble to say that there is no advantage in England; the very thought of camping in a green English field makes the Indian camper's mouth water enough to wash down the dust which sticks between his teeth. Dust itself can hardly be supposed to be a cause of enteric; it must first be liberally mixed with the bacilli, as out here; the same applies to flies; and I maintain that this very essential difference does exist, that the allowance of enteric bacilli is as 19·6 in India to ·8 in England, or probably more.

Milk Infection.—This in India, Major Faichnie says, can be ignored as a cause of disease. But why? Because of the great care taken in keeping out dust and flies. Water for washing utensils and for adulteration is as much used here as at home, hence we may conclude that the water here must be purer than where milk epidemics occur.

Nature of Incidence.—In most Punjab stations water for drinking is stored in iron receptacles, one for each barrack; these have iron taps, and every man gets the same water. I have never seen the earthenware *chattie* in use, which is so rightly condemned by Major Faichnie. If the iron receptacle was infected, the first drink should give enteric to all the susceptible young soldiers on arrival. I have never heard of such an outbreak in India.

As to the Lincoln epidemic, infection by contact for the secondary cases is just as reasonable a hypothesis as “dead ends,” especially as when attention had been directed to the water, people would have boiled the water or not drunk it, and there should have been no more cases. It is not apparent why the bacterial slime should collect or form at one period, to be all washed away later on, the force and amount of water being presumably the same, or even less, in Lincoln, as some of the supply was imported after the epidemic had begun.

The strongest argument adduced by Major Faichnie is certainly the non-contagiousness of milk epidemics; it would be most interesting if we could compare a milk with a water epidemic in the same area. Secondary cases can hardly be absent when a milk epidemic goes on for two months, as at Marylebone.

Major Faichnie's remarks as to the heat required to kill Eberth's bacilli are not quite in accord with Dr. P. G. Griffith's experiments given in the September number of the Journal for 1906.

With reference to the enteric in Jacksonville, Lexington and Knoxville, some people would at once think of the greater facility for contact infection amongst troops than in civil life, and if pure water was piped or carried it should have washed away the bacterial slime as supposed for Lincoln.

Personal Infection.—If sixteen nurses per annum are infected in London amongst educated people trained to deal with infectious disease, how many might we expect amongst raw country boys thrown together in new circumstances?—illiterate men, knowing nothing and caring less for the simplest principles of sanitation.

Presidency Towns and Agra.—The great danger from the

storage vessels is exactly the same here as in other barracks, and the supply is originally no purer; as to Agra, the great improvements count either way.

Ashanti Campaign of 1896-7.—Probably, as the water was so well looked to, the other important points were also driven home; as the force was small this could well be done.

Nile Barage Works.—With people camped out on burning sand the bacilli had no chance.

South Africa.—All evidence of contact infections, &c., is ignored.

Quetta.—Has a drop in the number of cases from two hundred and thirty-two in 1898 to twenty-six in the following year no meaning? Is "sanitation useless" which prevents two hundred and six cases of enteric in one year? In diets alone it means nearly £3,000.

Ceylon.—The remarks under this heading are sufficiently refuted by Surgeon-General Quill's able article in the September number of the Journal for 1906.

I would like to learn why the enteric bacilli will live in the friendly *chattie* and bacterial slime and not the cholera germ. The latter lived in the old sand filter, as a regiment found to its cost in Lucknow. Major Faichnie truly remarks "that cholera has been stamped out while enteric increases," and this proves, he thinks, "that the poison of the latter is more diffused." This is, indeed, the whole secret, as the supply of a pure water being sufficient to eliminate cholera, and insufficient to do the same for enteric, proves. A diffusion of the latter beyond the water, *i.e.*, to dust, flies, &c., and those regions beyond, are now the objectives for attack in India.

While disagreeing with the main contention of Major Faichnie's paper, I think that I may say we all appreciate it, and in this most interesting of all discussions it would be unscientific in the extreme to make light of any argument. Our enemy is protean, so must our attack be from every side.

A few further facts that it seems to me are not sufficiently considered may be briefly indicated. One is the marked immunity from attack of soldier's wives—they have the same water supply, and their system of storage differs only from that of the troops in being much worse.

I think one of the important differences in the conditions of sanitation of officers and men and of families is the attention the women pay to their dusters. The native cooks of both officers and

men throw the dusters about the floor, wipe their hands and faces with them, wear them as neck comforters, wipe the outside of pots with them, and keep them in use till black; whatever microbe is in or near the kitchen is therefore taken up and rubbed on to every plate, cup, &c., used. On the other hand, the soldier's wife keeps the *jharon* in her own possession and uses it for none of the above objects. When a married soldier or member of his family gets enteric it is probably the case that his wife has employed a *bawarchi* instead of doing her own cooking.

The varying monthly incidence of enteric in this country forms, I think, a serious objection to the water-borne theory. The supply and storage system seldom vary in the twelve months, while the enteric varies widely. Polluted water in Lincoln, as elsewhere, produced its effect in six weeks; why do not the drafts of young soldiers get the disease soon after landing in India? They drink the suspected water for six to twelve months before getting ill, and then they generally fall sick in ones and twos at a time, quite unlike water epidemics.

The enteric cases at Dalhousie in 1906 form an interesting commentary on this discussion. During the month of April about 2,000 Europeans marched up from the plains; all had the same water to drink. In only one regiment were there more than three cases of enteric fever during the season. The disease was prevalent in its plain station at the time it left for the hills. The admissions were spread over the eight or nine weeks subsequent to their arrival in Dalhousie and then ceased, except for a married man two months later. Now, if they had drunk infected water before leaving their station, why did they not all develop the disease after the usual period of incubation? It could not have been the water on the road up, or in Dalhousie, otherwise the young soldiers of the other regiments would have contracted it. As the cases nearly all came from two out of the four companies in the party, I conclude that the majority, if not all, were "contact cases." A very suggestive fact was that one of the first cases in the plain station was that of the quartermaster-sergeant, whose store, of course, has to be visited by all the recruits. A peculiarity of the attacks was the number of hæmorrhages, viz., 50 per cent., which resulted in the high mortality of 30 per cent. Only one man of the nineteen confessed to being temperate. The whey, &c., treatment of Dr. Ewart was carried out.