

BOVINE AND HUMAN TUBERCULOSIS IN INDIA.

A PAPER

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THE question whether bovine tuberculosis is communicable to man has been a subject of much discussion since Professor Koch announced his disbelief in such transmission, and I believe that the experience of medical men in India will not be without value as evidence in the controversy. For bovine tuberculosis is so rare a disease here that it may practically be left out of count as a factor in the spread of the disease. I have been a medical officer of health in India for more than twelve years, first in Madras and afterwards in Calcutta, and have inspected the carcasses and viscera of many thousands of cattle in the slaughter-houses, and also examined the udders of many milch cows without ever discovering a single tubercular case. I have visited the office of the Secretary to the Government of India, Revenue and Agriculture, without being able to procure any report on bovine tuberculosis; and the Inspector-General, Civil Veterinary Department, whom I addressed on the subject, forwarded me the following letter from Dr. A. Lingard, the Imperial Bacteriologist to the Government of India, giving his experience:—

“With reference to your letter, No. 718-412 M., dated 27th December, 1902, enclosing a letter from the Health Officer, Calcutta, I have the honour to inform you that during the last twelve years I have made every endeavour to obtain information with regard to the presence of tuberculosis in cattle in this country. Up to the present time, the only two officers who have sent me answers in the affirmative are:

“(I) Veterinary-Major J. Mills, who has recognised the disease in animals slaughtered for food in the Bombay abattoirs.

“(II) Veterinary-Captain G. H. Evans, who has recognised it in Rangoon.

“I have never come across a single case of tuberculosis in India proper or Baluchistan.”

I wrote to Major J. Brodie Mills of the Civil Veterinary Department, who is Principal of the Bombay Veterinary

College, and who has probably had more experience of cattle disease in this country than any other veterinary surgeon. He replied as follows:—

“Tuberculosis is in my opinion a very rare disease in cattle in India, and I speak from an experience of twenty-two years’ active work in the country.

“A copy of a paragraph from my Report on the Cattle at the Famine Camps at Ahmedabad is enclosed.”

Extract from the Annual Report of the working of the Glanders and Farcy Department in Bombay, dated 16th April, 1900.

CATTLE FAMINE CAMPS.

“There is one point of interest which I consider worthy of record. Out of forty-two post-mortem examinations made by me, I only found signs of tuberculosis in one animal, the seat of the disease being the lungs. This goes far to prove that the cattle of the districts are bred from extremely healthy stock. The absence of tuberculosis, too, can be largely accounted for by the fact that such cattle practically live always in the open: conditions inimical to the propagation of such a scourge.”

I also addressed Veterinary-Major Raymond, of the Civil Veterinary Department, Bengal, on the subject; and was favoured with the following statement of admissions of cattle patients into the Bengal Veterinary College Hospital since 1893-94, up to November, 1902-03, and the cases of tuberculosis during each year:—

Year.	No. of Cattle Patients.	Cases of Tuberculosis.
1893 to 1894	53	1
1894 to 1895	312	1
1895 to 1896	234	2
1896 to 1897	203	7
1897 to 1898	360	9
1898 to 1899	503	2
1899 to 1900	633	1
1900 to 1901	699	4
1901 to 1902	526	2
1902 to 1903	632	2
Total	4155	31

I wrote again to Major Raymond, to ask for evidence that the cases described as such were tuberculosis, and received the following in reply:—

“We do not make a speciality of tuberculosis, and, therefore, our notes are not very minute. To the best of my recollection, every case of tubercle actually died in the hospital, except one cow that was removed by the owner. All the cases that died were shown by post-

mortem to have advanced tubercle of the lungs at least, which was all I wanted for diagnosis. In some cases the tubercle bacillus has been searched for and found ; but it has not invariably been searched for. In some cases tuberculin has been used, and gave a reaction ; but it was not used in all cases, because it was not always available. I have not seen a case in the udder, but I must add I have never looked for one."

I must confess that I should have liked more precise evidence on the pathological appearances, the bacteriological examinations, and the tuberculin tests, in these cases; but as Major Raymond has the reputation of being one of the most capable veterinary officers in India, I cannot but accept his statement that a number of cases of undoubted bovine tuberculosis have been admitted to the hospital at Belgachia.

I have since obtained confirmatory evidence of bovine tuberculosis in India from Lieutenant J. Farmer, Civil Veterinary Department, Superintendent of the Government Cattle Farm, Hissar, Punjab, who has given me three years' figures:—

1900	...	...	...	21 cases.
1901	...	...	...	4 „
1902	...	...	...	4 „

I understand that some thousands of cattle are kept at the farm. The diminution in the number of cases would be due to the weeding-out of weakly stock. Lieutenant Farmer informed me that he had seen tubercular mammitis in India. His service has principally been in the Punjab, where severe winters are experienced, so that for several months in the year the cattle do not live so much in the open air as they do further south.

The small amount of attention which tuberculosis has received in India at the hands of the veterinary profession, when compared with such diseases as anthrax, rinderpest, and surra, is, I take it, strong evidence that it is comparatively rare when compared with its prevalence in Europe. I have questioned the Superintendent of the Municipal Slaughter House, Calcutta, who sees about 100,000 carcasses of cattle a year, and he informed me that he had never seen "grapes" in the pleura in India. He is the son of an Essex butcher, and was brought up to the trade, so he should have no difficulty in recognising a well-marked case of the disease. In the face of Major Raymond's experience I am inclined to think he may have overlooked cases ; but if the disease had been at all prevalent, I do not think it could have escaped attention.

2. The flesh of the ox or cow is not eaten by Hindus, and in some native States it is unlawful to kill cattle for food, though the Mahomedans eat beef when they can get it. Tuberculosis, however, is not more common amongst Mahomedans than amongst Hindus. In the opinion of native doctors with whom I have discussed the point, the reverse is the case.

3. The manner in which dairy products are eaten is practically the same for Hindus and Mahomedans. The first of these is ghee, or clarified butter, which is made by boiling the butter-fats in large iron pans, a process which no tubercle bacillus could survive. Ghee is used in curries and in sweetmeats, and vegetables and cakes of different kinds are fried in it. If milk is drunk as such, it is almost invariably boiled. It is generally taken in the form of curds and whey, which are prepared in a number of different ways, but the milk is almost invariably boiled first. Channa, or curd cheese, is sometimes eaten with sugar, but it is mostly used in the preparation of sweetmeats, when it is mixed with sugar and boiled or fried in ghee.

4. Tuberculosis not being a tropical disease does not appear to have attracted much attention in India. We find even a well-informed medical officer like Dr. Crombie stating at the Berlin Congress that "figures confirm the experience of all medical men in India that, in contrast with that of Europe, diseases of the chest and phthisis amongst them, take quite a subordinate place in the mortality of India."

In Europe most people in at all an advanced state of tuberculosis are seen by qualified medical men, and the disease they are suffering from is for the most part correctly diagnosed, with the result that fairly reliable statistics are obtainable. In India quite the contrary is the case. The majority of the poorer classes are not attended by medical men in their illnesses, and when they die their deaths are registered by people with no knowledge of medicine, or even of the names of familiar diseases. Tuberculosis is commonly spoken of as "fever." Very often malarial fever is followed by tuberculosis; and in such cases the history of malaria, with—it may be—enlargement of the spleen, will mislead a medical man inquiring into the cause of death, the pulmonary symptoms having attracted little or no attention. Again, cases of tuberculosis of the bowels are apt to be mistaken for chronic dysentery, which is a common disease in this country; and fatal cases of respiratory disease, in which dyspnoea is a symptom, are frequently regis-

tered as asthma, which is not in itself a fatal disease. So any statistical records of tuberculosis in India are calculated to be considerably below the actuals. In order to find what a prevalent disease tuberculosis is in India, we must go to the statistics of Presidency towns, where the registration of deaths is somewhat better than it is in the districts, and see the jail returns and those of the troops serving in India, both European and native. For about the last six months every case of death occurring in Calcutta has been inquired into by the sanitary inspectors, nearly all of whom are medical men who have qualified in the local medical college. The returns show about $6\frac{1}{2}$ per cent. of the total mortality as due to tuberculosis. I have been through the recorded histories of the cases, and believe that 10 per cent. would be nearer the mark. Out of 966 consecutive post-mortems done by Captain Leonard Rogers, Indian Medical Service, at the Medical College Hospital, Calcutta, in 13.4 per cent. death was due to tubercle of the lungs, and in 3.6 per cent. to other forms of tubercle. The conditions of life in Calcutta are most favourable to the spread of the disease, for the site of the town is low-lying and alluvial, with a high subsoil water, and the poor people many of them sleep on the ground in overcrowded and ill-ventilated tenement houses or huts. I have seen the earthen floors of the huts covered at night with sleeping forms so that there was nowhere room to put down a foot, though such extreme overcrowding is not general. Besides this, many of the poor natives sleep in the cold weather with no more covering than a thin cotton cloth, though I, a European, sleeping on a bed, require two blankets over me. Add to this insufficiency of nourishing food and long hours of work—for the "sweater" is not unknown in Calcutta—and the disease could not help spreading in such surroundings. The disease, however, is by no means confined to the poorer classes, for practitioners in the town assure me that there is hardly a well-to-do family that has not got its case or cases. Some of the practitioners in the town are of opinion that the disease is much more prevalent than it was a few years ago: which might be expected, as the population of the town has largely increased, and no provision has been made for the additional population. In point of fact, many hutting grounds have been cleared and devoted to other purposes without any provision being made for the people displaced; the principle that a constructive policy must go hand-in-hand with one of demolition not having yet met with general acceptance. Municipal statistics support the view

that the prevalence of the disease is increasing, for, taking periods of five years from 1875, I find that the death-rate from phthisis has nearly doubled, and that from diseases of the lungs has rather more than doubled, in the last twenty-eight years, during which period it has about been reduced by half in countries where sanitary effort has been better applied. I have made recommendations both as regards the housing question and measures for dealing directly with the spread of the infection, and perhaps in time something may be done to check this high and preventible mortality. In Bombay, where aggregation is more intense than in Calcutta, the mortality from tuberculosis appears to be still higher, for the deaths registered under tubercular diseases for 1899, 1900 and 1901, were 6,029, 8,199 and 7,089 respectively. If plague, which was an exceptional cause, be excluded from the total mortality, those figures give a percentage mortality of 12.4 and 17.3 and 14.8 to the total mortality of the town. The following figures, taken from the Jail Reports, are instructive as showing the prevalence of the disease; for unless the sanitary condition of Indian jails is defective, and overcrowding of prisoners the rule rather than the exception, the disease must be contracted in the majority of the cases previous to admission:—

Percentage of Deaths to General Mortality.

		Phthisis Alone.			All Lung Diseases.
North-West Province jails	...	10.25	...	...	31.66
Bengal jails	... ..	12.82	...	...	28.22
Burma jails	... ..	19.06	...	...	31.16
Andamans Penal Settlement	...	17.2	...	...	27.8
All Indian jails	... ..	11.64	...	...	28.66

From a note on "Jail Tuberculosis" in the *Indian Medical Gazette* for November, 1902, by Dr. Ernest Water, Indian Medical Service, the writer, who is a jail superintendent, expresses his opinion that a certain proportion of the jail tuberculosis is contracted after admission; that it generally affects both the lungs and the bowels; and that it cannot be contracted from food, as the prisoners get neither milk nor beef, and all the food is constantly being examined. Even among healthy young adults in the European and native army, tuberculosis is not an uncommon disease, as shown by the following figures extracted from the report of the Sanitary Commissioner for 1900, which show that in the European army the admissions were 3.7 and the deaths 0.64 per 1,000; in

the native army 4 and 0.87; and in the jail population 9.6 and 5.1 :—

Disease.	European Army in India.						Native Army of India present, 123,463; Enrolled, 146,727.			Jail Population, 121,811.		
	Men, 60,553.				Women, 2,908.		Children, 5,376.		Admissions.	Deaths.	Admissions.	Deaths.
	Admissions.	Constantly Sick.	Deaths.	Invalids.	Admissions.	Deaths.	Admissions.	Deaths.				
Tubercle, not defined ..	..	..	..	..	..	..	..	..	..	..	3	3
" general ..	1	.04	1	..	..	2	1	..	..	..	3	2
" of meninges ..	..	..	..	..	..	1	1	3	2	1	1	1
" of the brain ..	..	..	..	..	..	..	..	..	..	..	1	1
" of brain and membranes ..	..	..	..	..	..	4	3	—	—	—	—	—
" of the larynx ..	1	.22	—	—	..	—	—	—	—	—	—	—
" of the lungs ..	205	38.71	35	94	11	2	1	456	94	70	1029	541
" of lungs, larynx, and intestines ..	..	..	..	..	..	..	..	..	..	..	1	1
" of lungs and intestines ..	..	..	..	..	..	..	1	1	..	..	38	25
" of lungs, intestines, and peritoneum ..	..	..	..	..	..	..	..	1	1	—	—	—
" of the lungs and peritoneum ..	..	..	..	..	..	..	..	1	1	..	1	1
" of the lungs and glands ..	..	..	..	..	..	..	..	..	..	..	1	1
" of the intestines ..	1	.07	..	..	..	..	4	..	..	3	3	58
" of abdomen and peritoneum ..	..	..	..	..	..	..	..	..	..	..	1	1
" of the peritoneum ..	..	..	..	..	..	..	1	..	2	3	..	4
" of the spleen ..	1	.06	1	—	—	—	—	—	—	—	—	—
" of the lymphatic glands ..	3	.67	..	5	..	..	1	1	31	1	6	31
" of the kidney ..	1	.01	1	—	—	—	—	—	—	—	—	—
" of the spermatic cord ..	..	..	..	..	..	..	..	1	—	—	—	—
" of the testicles ..	5	.70	..	1	..	..	..	1	..	2	—	—
" of bones ..	1	.06	..	..	..	..	..	1	—	—	—	—
" of joints ..	5	1.15	1	1	..	..	2	4	1	..	1	1
" of the spine ..	..	.01	..	1	—	—	—	—	—	—	—	—
" of the skin ..	1	.07	..	..	..	..	..	..	..	..	1	—
Total ..	225	41.77	39	102	11	2	17	7	501	106	82	1177

5. Tuberculosis is by no means confined to town populations, for district medical officers have told me of villages where the disease was very prevalent, especially in the northern part of India, where the people sleep in the cold weather in ill-ventilated huts, and lie close together to keep warm; and I have myself seen advanced cases in remote villages in the Himalayas, which have been brought to my tent for treatment.

6. By the kindness of the Principal and Registrar of the Calcutta Medical College, I have obtained records of 649 cases of tuberculosis which have been admitted to the hospital in three years. Of these, only 11 were under 10

years of age: which only proves that tuberculous children were not brought to the hospital for treatment. It may, however, be taken as negative evidence in support of the generally-accepted belief that tuberculosis amongst children is a rare disease in India. The age of most of the patients was between 20 and 40. They appear to be drawn from all the native races, and from all trades and callings, none of the trades with which pulmonary disease is usually associated being noticeably predominant. Six cases were diagnosed as *tabes mesenterica*, all adults except one, a Eurasian boy of nine. I have tabulated the cases under the following headings:—

Tubercle of the lungs or thorax	...	...	509
" " lungs and intestines	...	...	49
" " intestines or peritoneum	...	...	13
" " meninges	...	...	7
" " brain	...	...	1
" " larynx	...	...	2
" " larynx and lungs	...	...	6
" " glands	...	...	20
" " spine	...	...	13
" " bones or joints	...	...	26
Tubercular ulcer	...	...	3

The Superintendent of the Campbell Hospital, which is a large native infirmary as much as a hospital, kindly gave me a statement of 858 tuberculous in-patients and 118 out-patients, who received treatment in his hospital in three years. With few exceptions, they were diagnosed as tuberculosis of the lungs. Only one of the 858 in-patients was under 10 years of age, 680 being between 20 and 40. The admission of cases of tuberculosis in the Medical College Hospital is discouraged, so the number of cases diagnosed in the wards or shown post-mortem to be tubercle is the more noteworthy.

7. Although the evidence which I have been able to collect is far from complete, and my statistics are wanting in accuracy, I think that they are sufficient to show:

(1) That bovine tuberculosis is found, but is a comparatively rare disease in India; (2) That a large proportion of the population does not eat beef in any form; (3) That the products of the cow are almost invariably sterilised before consumption, both by Hindus and Mahomedans; and (4) that human tuberculosis is a very prevalent disease. So far as the negative evidence I have been able to collect goes, I may add that primary abdominal infection in children is rare in this country; and though the removal of tuberculous cervical glands has been performed at the

Medical College Hospital in a certain number of cases, it is a matter of everyday observation that scars on the neck from glandular abscesses are rare amongst natives--and I might add amongst European and Eurasian children in this country. I am of opinion that this evidence supports the view that there two tuberculoses with which the human subject may be infected: (1) The so-called human tuberculosis, a disease for the most part of adult life, and transmitted principally by the sputum in the form of spray or dust; and (2) the so-called bovine tuberculosis, a disease of infancy and childhood, transmitted from the cow to the human subject by tuberculous milk; and that whilst the human disease is very prevalent in India, the bovine form is rarely met with; and this conclusion appears to be gaining ground in Europe, judging from the articles on the subject which I see in the medical journals.
