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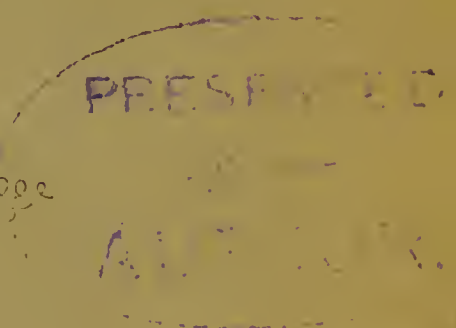
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J.B. Scribner

# THE PROPAGATION OF CHOLERA

BY

## HUMAN INTERCOURSE.



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THE outbreak of cholera in Egypt and the recent discussion, at the Epidemiological Society, on the sanitary lessons of Indian epidemics, have induced me to reprint, without note or comment, an article and a letter which appeared in the *Lahore Civil and Military Gazette* during the cholera epidemic of 1879, in the hope that light may be thrown on some of the many difficult questions, connected with the propagation of this mysterious disease.

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## Extract from the "Lahore Civil and Military Gazette," of July 1st, 1879.

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THE present epidemic of cholera in Upper India and its supposed connection with the Hurdwar fair have naturally attracted much attention, not only in this country, but also in other parts of the world. Coincident with another large gathering, such as there was in 1867, cholera has again broken out in 1879, and, in the belief of many, has been diffused far and wide by the pilgrims. This diffusion by pilgrims has been telegraphed to the *Times* as if it were an established fact, and it has formed the subject of leading articles and letters in the Indian papers. People generally seem to have come to the conclusion, that if there had been no Hurdwar fair, there would have been no cholera, and that, therefore, it is incumbent on the Government to step in and absolutely prohibit fairs, which cause so much loss of life.

2. On every ground it is very desirable that the facts should be ascertained with as great exactness as possible. No interference with the religious prejudices and habits of the people could be justified except on the clearest evidence that such interference is really called for, and that it would lead to beneficial results. The whole world, moreover, is interested in learning the truth regarding a disease which is so much dreaded, and the ways of which are as yet so hard to understand.

3. But to be of any value the investigation must be conducted in a careful, and as far as means will allow, on an exact method. Loose statements or mere expressions of opinion, however decided they may be, will not aid in arriving at a just conclusion. The more carefully collected facts that can be got together the better. If every district in India from which people went to this great fair could furnish particulars of their number and history, both during their absence and after their return, and at the same time give a correct record of cholera cases among those who had not been to the fair, a vast body of evidence would be available from which much might be learned.

4. But it seems hopeless to obtain all this information. If asked for in a general circular, the importance of the subject would probably be lost sight of, and it might be looked on as a mere matter of routine. I would, therefore, suggest that a few

districts should be selected in each of the provinces of Upper India, and that the district officers in them should be asked to use their best endeavours to collect data under the following heads :—

(1) The approximate number of pilgrims that went from their district this year to Hurdwar fair.

(2) The time about which they left for Hurdwar.

(3) The number of them that died of cholera during all the time they were away, distinguishing, if possible, how many of these deaths occurred at Hurdwar itself, and how many at other places on the way back.

(4) The time about which they returned to the district from Hurdwar.

(5) The number that died of cholera after their return.

(6) The date of first case of cholera, and total number of cases among *them* after their return.

(7) Date of first case of cholera this year among the *residents* in the district, that is to say, among people who had not been to the fair.

(8) Total cases and deaths from cholera in the district since 1st January by weeks.

(9) Reasons, if any, for attributing the disease among the residents to the pilgrims. What connection, if any, was there between the pilgrims and residents attacked ?

5. It may not be possible fully to answer any one of these questions, which are given to indicate generally the heads under which data are desired. Where replies cannot be given for a district as a whole, they may perhaps be given for one or two of the principal towns. But it is most important that the facts should be thoroughly sifted, and that no evidence be accepted without careful inquiry. It is essential, moreover, that these facts should be kept quite distinct from any theories which are based on them.

6. The districts I would suggest are the following. They have been selected partly because of their geographical position, and partly because of the history of cholera in them during the current year, so far as this can be ascertained from the mortuary records :—

NORTH-WESTERN PROVINCES AND OUDH.

Kumaun and Garhwal.		Meerut.
Terai.		Bulandshahr.
Bijnor.		Bareilly.
Saharanpur.		Moradabad.
Muzuffarnagar.		Lucknow.

## PUNJAB.

Umballa.		Lahore.
Kurnal.		Amritsar.
Hissar.		Peshawur.
Sirsa.		Rawal Pindi.
Kangra.		Jhelum.

## CENTRAL PROVINCES.

Jubbulpore.		Saugor.
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7. I would also suggest that the Foreign Department be asked to collect similar information from the Native States of Central India and Rajputana and also from Baroda, from which I understand a considerable number of pilgrims went to the fair at Hurdwar.

8. To many persons such an inquiry as I have above recommended may seem altogether useless, and in fact, a mere waste of time. They are so thoroughly persuaded that the cholera was due to the pilgrims, and to the pilgrims alone, and that no further evidence is required. But as the inquiry, to be of any value, must be conducted without any preconceived basis, it will not be out of place to cite a few facts and considerations which throw grave doubt on the pilgrim doctrine, and render its acceptance by no means so ready or satisfactory a settlement of the question as has been supposed.

9. The first fact is, the very unequal incidence of the disease: some districts have suffered severely; others lying close to them, and which probably sent just as many pilgrims to the fair, have escaped almost entirely.

10. In the second place, in some parts where the disease has been worst since the fair broke up, it had been present in a decided form before the fair took place. In Garhwal and Kumaun, for example, it was present for months before the fair.

11. Thirdly, the history of the disease, so far as can be gathered, is not that of a disease gradually affecting new centres and spreading from them, but of a disease which affected many centres within a very short period of time, and then instead of spreading, declined. In the Punjab, for example, between the 1st and 15th April, nine places returned deaths from cholera. Between the 16th and 21st the number rose to 39. From the 22nd to the 26th, it declined to 21; and during the last four days of the month it was only 10.

12. According to the mortuary returns, there has been no radiation of the epidemic from Hurdwar as a centre—no gradual diminution of its intensity in all directions, as the pilgrims, the supposed cause of its spread, became more widely dispersed, and

therefore less numerous in proportion to the general population. On the contrary, many of the places which have suffered most are the most distant from Hurdwar—as, for example, Peshawar, Afghanistan, and Sind.

13. The epidemic movement has been almost entirely in one direction,—*upwards*; and yet the pilgrims have moved in all directions.

14. Often pilgrims may have been the first attacked, and they may have suffered more than the general population. This can hardly be wondered at, considering the insanitary conditions to which they are for the time subject, the fatigue, want of regular meals, dirt and overcrowding; but for all the reasons above given it seems not improbable that the pilgrims merely suffer from the same influence as is affecting the ordinary population, but that they are more susceptible to it, and therefore suffer sooner and more severely.

15. If the spread of a wide epidemic such as that of the current year, be dependent on pilgrims or other human intercourse, it is dependent on contagion, or in other words on accident, or rather on a vast series of accidents which occur in a year of cholera and do not occur in another year. The theory of accident seems altogether insufficient to account for such results.

16. Further, the similarity between the 1867 and 1879 cholera is most remarkable. It seems hardly conceivable that in these two years such vast results should be due to accidents, and that in both these accidents should be so arranged as to bring about such a remarkable similarity in these results.

17. In conclusion, it must be remembered, especially by those who advocate the prohibition of fairs as the best means of checking cholera, that although there has been the coincidence of a great epidemic conjoined with a great Hurdwar fair in 1867, and again the same coincidence in 1879, in the intervening years epidemics much more severe and widely spread than that of 1867 have occurred—as, for example, in 1869, when there was no cholera at the Hurdwar fair, and no connection could possibly be claimed between the epidemic and pilgrims. Fairs might be prohibited, though such a measure would be considered as a great hardship by the people; but to stop all the traffic of the country is simply impossible—and yet this is the measure which the acceptance of the human intercourse theory would demand.

18. On the other hand, the sanitary improvement of towns and villages—the provision of pure air, and pure water and good drainage, although difficult, and doubtless requiring time and education for its accomplishment—is by no means impossible.

J. M. CUNINGHAM,

*Sanitary Commissioner to the Government of India.*

*The 12th June, 1879.*



## Extract from the same Paper, of July 11th, 1879.

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### LETTER TO THE EDITOR.

SIR,

An article appeared in your issue of July 1st, by Dr. Cuninghame, Sanitary Commissioner to the Government of India, on the subject of the present epidemic of cholera, in which the question of its propagation by pilgrims from the Hurdwar fair is discussed. As Dr. Cuninghame has heretofore been looked upon as the champion of a portion of the medical profession, who believe cholera to spread, not by human intercourse, but under certain atmospheric or other conditions which have not yet been fathomed, and which are, therefore, uncontrollable by human foresight, I cannot but rejoice to see, in the present communication a tendency to consider the question still *sub judice*, and a desire to set inquiries on foot, with the view of obtaining more exact knowledge on the subject.

2. Questions raised by so high an authority deserve the most careful consideration, and, as Lahore is one of the places at which he desires that these investigations should be made, I think it is well that I should take some notice of his paper. There are a few points, however, in which it appears to me that Dr. Cuninghame's statement of the case is not altogether unbiased, viz.:—

First he speaks of only two epidemics, those of 1867 and 1879, which have had an obvious connexion with the Hurdwar fair, whereas there certainly have been three, for the cholera of 1872 was quite as clearly connected with the lesser gathering of that year as the epidemics of 1867 and 1879 with the greater ones.

Secondly, he speaks of "people generally," as having "come to the conclusion that, if there had been no Hurdwar fair, there would have been no cholera." Now this certainly does not represent the opinion of the medical profession generally; for a very large section of us, of which in this letter I claim to be the representative, hold no such view. We are content, for the present, to leave untouched the question of *de novo* production, and we look upon the Hurdwar fair simply as one of the means, by which the poison is reproduced multiplied and disseminated.

3. I now come to the inquiries which Dr. Cuninghame desires to have made with reference to this so-called *pilgrim doctrine*. These are contained in his fourth paragraph; I prefer to take No. 8 first, and numbers 6 and 7 next.

Dr. Cuninghams's eighth question runs as follows :

"Total cases and deaths from cholera in the district since 1st of January by weeks."

The returns by the Sanitary Commissioner of the Punjab show but one death, registered under the head of cholera, from January 1st to April 18th, in the Lahore district. This occurred during the week ending February 1st at a place called Moghul Serai, several miles from the station of Lahore where the first cases of the present epidemic were observed. It is more than probable that this isolated case was not one of true cholera, but even if it were a true case, the immunity of the whole district from January 1st to April 18th, with one single exception, is equivalent to a clean bill of health as regards this disease.

6. "The date of the first case of cholera, and the total cases among *them*, (pilgrims) after their return?"

7. "Date of first case of cholera this year among residents in the district, &c."

The first two cases of cholera were pilgrims from Hurdwar. They were admitted into the hospital at Lahore, on April 19th. At this time, the neighbourhood of the railway station was crowded with pilgrims, on their way to places above Lahore, and there were not trains enough to take them on. Many, of course, wandered into the city and bazaars, and the following day, April 20th, furnished three cases from among the residents of Lahore, who had not been to Hurdwar. The two pilgrims mentioned did not belong to this district, but were waiting for a train to take them northward. It appears to me, therefore, that the second clause of question No. 6, and questions Nos. 1, 2, 3, 4, and 5, become irrelevant, as they seem to have been propounded on the presumption that cholera, if spread by pilgrims at all, would be spread in each district only by those belonging to that district, whereas the facts are far otherwise.

9.—"Reasons, if any, for attributing the disease among the residents to the pilgrims, &c.?"

My reasons are: first, that there was no cholera till the pilgrims came; secondly, the first cases were pilgrims; thirdly, though no immediate connection was proved between the pilgrims and the first three residents that fell sick on the 20th, the 21st furnished one case among the railway police, and the 22nd another among the railway porters who had been engaged in handling pilgrims' baggage.

4. Let us now examine the "facts and considerations," which in para. 8 of Dr. Cuninghams's paper are said to "throw grave doubt on the pilgrim doctrine."

"The first fact is," says Dr. Cuninghams in para. 9, "the very unequal incidence of the disease; some districts have suffered severely, others

lying close to them, and which probably sent just as many pilgrims to the fair, have escaped almost entirely."

Surely this would apply to any mode in which an epidemic might arrive, the extent to which a place suffers being notoriously liable to great variation, depending on its sanitary state, the number of susceptible persons in it, and other conditions too subtle for analysis. A single case of cholera in one locality, and under certain circumstances, may light up an epidemic that will decimate the inhabitants, while in another place a dozen cases will fail to spread the disease at all. We cannot, therefore, look for any direct proportion between the number of pilgrims returning to any particular district, and the number of residents afterwards affected with cholera. In this paragraph it is easy to discern again Dr. Cuninghams's idea that pilgrims can only spread the disease in their own district.

"In the second place" says Dr. C. in para. 10, "in some parts where the disease has been worst since the fair broke up, it had been present in a decided form before the fair took place. In Gurhwal and Kumaon, for example it was present for months before the fair."

This is in favour of the pilgrim theory, not against it, for Gurhwal and Kumaon were very probably in some degree the original foci of the disease, whence it was carried to Hurdwar, to be reproduced multiplied and disseminated.

"Thirdly the history of the disease" (para. 11), "so far as can be gathered, is not that of a disease gradually affecting new centres, and spreading from them, but of a disease, which affected many centres within a very short period of time, and then, instead of spreading declined."

This is also in favour of, not opposed to, the pilgrim theory; it is just what would be expected: when a vast number of cholera carriers were passing along the country, they would drop a few cases here and there within very short spaces of time, especially along the railway line, and the sequence of first cases at different places from Umballa to Lahore leaves no doubt whatever of the disease having travelled in this direction; while Dr. Fairweather's remarks on the mortuary return for the week ending April 19th, show conclusively that the pilgrims were the carriers.

The statement is not strictly correct that in all the infected localities, the disease *instead of spreading, declined*, for in some places in the Lahore district, it has spread to an appalling extent. This, however, as far as I can see, tells neither for nor against the pilgrim doctrine.

Para. 12 and 13.—"There has been no radiation of the epidemic from Hurdwar as a centre." "The epidemic movement has been almost entirely in one direction *upwards* and yet the pilgrims have moved in all directions."

We need not call the propagation and dissemination of a disease *radiation* unless we like—we cannot of course compare it

to the radiation of light from a centre, which would be equal in all directions. Nobody ever suggested, as far as I know, that epidemics would radiate equally in all directions, in fact, it is well known that as a rule they do not. Cholera for instance, over long distances, generally but not invariably, travels westward. This may perhaps be in part explained by the fact that its home and original starting point is the deltâ of the Ganges, from which the means of human communication are much more complete, and the traffic immensely greater, in the westerly than in any other direction; yet there are instances, even in the present epidemic, of its travelling in other directions, as for example southwards from Hurdwar to Meerut and Delhi; moreover Dr. Cuninghame in para. 10, points out that in Garhwal and Kumaon, which lie to the east of Hurdwar, the epidemic has been very severe since the fair, although it was present there before: how then can he be certain that it was not carried back there from Hurdwar?

Para. 12.—“No gradual diminution of its intensity in all directions as the pilgrims became more widely dispersed . . . . On the contrary, many of the places which have suffered most are the most distant from Hurdwar, as for example Peshawur, Afghanistan, and Sind.”

Dr. Cuninghame here throws doubt on the pilgrim doctrine because the intensity of the epidemic has not diminished with the distance from the centre. It would really *appear* that we are not to admit the dissemination of any epidemic by human intercourse, unless it follows strictly the laws of light and heat! But I am willing to believe that I have mistaken Dr. Cuninghame's meaning, and would refer my readers to my remarks on the unequal distribution of cholera, at the commencement of this paragraph.

Para. 15.—“If the spread of a wide epidemic be dependent on pilgrims it is dependent on contagion, or in other words on accident, or rather on a vast series of accidents,” &c.

I fail to understand this; but if it be really true, let us substitute the word *contagion* for *accidents* in Dr. Cuninghame's para. 16; we shall then read as follows; “it seems hardly conceivable that in these two years” (1867 and 1879) “such vast results should be due to *contagion*, and that in both this *contagion* should be so arranged as to bring about such a remarkable similarity in these results.”

How, I would ask, can this be said to be hardly conceivable? On the contrary, it seems to me the very most likely thing to happen—given two similar gatherings of people at the same time of year, at the same place, under similar circumstances; what more probable than that the results would be strikingly similar?

Para. 17.—Epidemics much more severe and widely spread than that of 1867 have occurred when there was no cholera at the Hurdwar fair." "Fairs might be prohibited, but to stop all the traffic of the country is simply impossible, and yet this is the measure which the acceptance of the human intercourse theory would demand."

I have little to say on the first part of this paragraph as the fact of epidemics having occurred, independently of the Hurdwar fair, by no means disproves the possibility of their being sometimes dependent on it. But, to Dr. Cuninghams's remark that the acceptance of the human intercourse theory would demand a stoppage of all the traffic of the country, I would reply that no sane member of the medical profession has ever, to my knowledge, made so extravagant a proposal. I am even opposed to quarantine, except in the case of public institutions, such as jails, lunatic asylums, &c. I do not deny that to stop all human intercourse would in all probability arrest the progress of cholera, but to stop human intercourse completely is impossible, and if it were possible, the remedy would be worse than the disease.

5. I will now state a few well established facts with reference to the spread of cholera.

(1st) It generally travels over long distances in the main lines of human communication; but it may deviate from these lines and attach itself to parties of persons travelling by the less frequented roads. This occurred in 1872, when cholera was carried by a band of pilgrims returning from Hurdwar to Jummoo, not along the grand trunk road, but *viâ* Jagadri, Hooshyarpore, Goordaspore, and Sialkote.

(2nd). It never travels, over long distances, faster than men travel. This is universally true, whether its route be by rail or road, across a continent, or over the Atlantic Ocean. Putting this together with many other facts, such as those already treated of in this letter, we infer that human beings are the carriers. Hence, at Lahore, we find a great difference between the recent and the older epidemics, in the rapidity with which they reach us from below. Thus, in 1862, when there was no railway except from Umritsur to Lahore, the first cases were observed

At Kurnaul on	...	...	...	May	17th.
„ Loodianah on	...	...	...	„	24th.
„ Ferozepore on	...	...	...	„	24th.
„ Kusoor on	...	...	...	June	25th.
„ Lahore and Umritsur	...	...	...	July	22nd.

Whereas, this year 1879, the disease has travelled from Hurdwar to Lahore in a week from the 12th April, the great bathing day, immediately after which the dispersion begins, to the 19th.

(3rd). Over short distances, as between different localities of the same city, or from the city to the suburbs, it is probably sometimes carried by the wind, but more notably by the drinking water which frequently becomes contaminated with cholera excretions.

(4th.) Small streams such as canal cuttings are more readily contaminated than larger; but if a million of people bathe at one time in a river like the Ganges, many of them having the cholera poison about them, the great stream may be as much polluted as the small one, and as all the pilgrims drink the water while bathing, the poison is imbibed at once, and the conditions are most favorable for a reproduction of the disease in every susceptible individual. They then go to their homes, the susceptible persons fall sick after variable periods, and the cholera cases are dropped at different places on the railway line, having in many instances first communicated the disease to their fellow passengers in the closely packed railway carriages; others not susceptible themselves convey the poison in their clothes, and as pilgrims do not wash after leaving the Ganges, till they reach their homes,\* the poison may, by that time, have attained a great development and activity, as will be explained in the next paragraph.

\* See Report on the Sanitary Administration of the Punjab for 1872, Section II., para. 50.

6. The mischief done by the Hurdwar fair, therefore, may thus be summed up.

*First*, it gathers together persons from various infected localities, as well as healthy people from other places.

*Secondly*, the pilgrims from the infected localities bring the poison to Hurdwar, some convey it in their clothes, others in their bodies. In the clothes of such people it is subjected to filth, heat, and moisture, which are the circumstances most favorable for its activity and communicability to others. Those who have it in their bodies fall sick, and thus reproduce and multiply the contagion.

*Thirdly*, others imbibe the poison, either primarily from the clothes in which it has been brought, or from the bodies of the sick, or secondarily from their evacuations, and either through the medium of the air which is breathed, or the water which is drunk.

*Lastly* comes the dissemination of the disease over the country, in the way already described.

7. Finally, I cordially agree with Dr Cuninghame in his last paragraph, that even more important than the stoppage of the Hurdwar fair, is the sanitary improvement of towns and villages, and the provision of pure air, pure water and good drainage.

It may be impossible for Government to prohibit the Hurdwar fair; and even if it were prohibited, it is evident that we should not enjoy a complete immunity from cholera, as it sometimes occurs independently of any such assemblage. Seeing, then, that we cannot keep the enemy entirely at bay, let us be prepared, by the excellence of our local sanitation, to contend with him successfully when he assails our homes.

J. B. SCRIVEN,

*Civil Surgeon.*

LAHORE, 5th July, 1879.



