

dated two years after Firth's book was published, is initialled "R. H. F.," which stands for Lieut.-Colonel R. H. Firth.

3. That, at any rate, deals with the cubical contents, as the other book does?—Yes; in the other book he gave 50 and 40, and now he comes down to 20 ft.

4. *Mr. Ferguson.*] But a space 20 ft. long by 1 ft. wide would not be a suitable place?—No; it must be 6 ft. by 3 ft. 4 in.

5. Is 3 ft. 4 in. a sufficient space for a man?—By the analogy of the tents I think it is.

6. *The Chairman.*] But the men's heads in the tent are much farther away?—No, sir; they are fairly close together.

7. There is nothing to go by in the books?—No. Mr. Campbell has addressed you with regard to the ventilation methods in sanatoria, and I visited four of the principal German sanatoria in 1901, and therefore have had personal experience. In their hospitals the principal system was to make use of cross-air admitted direct through the window fanlights.

8. But if the temperature is the same inside as outside the hut, is it not right to increase the ventilation by making the opening 6 ft. instead of 6 in., so that the men should be as though they were in the open air?—I would have had it like the open-air sanatoria at Cambridge, England, but you would have to educate the men and public to that. Then there is the question of dining and sleeping in the same room. The pictures we were shown of Kitchener's Army and their huts at Home in almost all cases show that the huts were used for both dining and sleeping.

9. Dr. Martin directs my attention to a statement in this work on Municipal and Sanitary Engineering, from which you have quoted, to the following effect: "Whenever possible special accommodation should be provided in all camps for the eating of meals and the storage of food. The eating, storage, or retention of food in the living tents or huts must be discouraged, as the facilities for contamination in these crowded places are great"—Yes, sir, and my Board recommended that a food-store be provided. Colonel Firth also makes the same point in his book. As to the walls, you will have noticed in our report that our Board recommended that all wood-work should be treated with sanitary distemper. Our object was to render the inside of the huts as germ-proof as possible. Therefore, from a standpoint of ready disinfectant, we were justified in favouring iron. It is obvious that you would not have an operating-theatre lined with wall-paper. Zinc lining would not look very well, but it would make a very suitable aseptic wall. The walls of these huts are aseptic for a considerable portion. If they were covered with untreated wood you would have dust gathering, and there would be also undesirable odours. Therefore, having in view the fact that a serious infectious disease has broken out, I myself am unwilling to take the responsibility of a departure from a wall which can be readily cleaned, and which itself does not absorb either odours or germs. It is not only the question of the lining being considered from a warmth point of view, but the lining must be very tight, otherwise the dust will go through. The lining would require to be treated with some material to render it unabsorbent. I think, then, particularly in view of the weather we have ahead of us, that lining will be simply putting on another wall, and producing an aseptic surface when already an aseptic surface exists. When I recommended the filling-in of the little spaces between the corrugations and the timber it was not only from the point of view of draughts reported, but because they were already, as I saw, becoming receptacles for dust and bits of dirt. I think one member of the Commission will remember that I held a match close to the wall, and we saw there bits of shavings, and so on, so that I had in mind the necessity for keeping the wall and floor as readily disinfectable as possible. I would urge upon the Commission that the comfort to be produced by lining the walls must in this case be considered with due regard to the necessity for securing that no danger shall exist from infection by dust or anything adhering to the surface of the wall. Now, as to the aspect of the building, to place the buildings absolutely north and south did not appeal to me, for the reason that the early morning sun, in winter especially, cannot be counted, because it is of little value, as the hill is in the way. The eastern approach of the sun is shut out to a certain extent by the hills. Therefore I personally thought it was better to turn them as they are now, which also suited the general configuration of the locality as to the main road and the branch roads off same. That would ensure the buildings getting the whole advantage of the afternoon sun, and we all thought it better to try and get as much of the available sun as was possible. I think that as much sun as possible gets into those buildings, and as much as they are now turned as would get into them if they were turned absolutely north and south. That is my feeling. I have seen a plan drawn showing these huts turned absolutely north and south, and the difference is very little from what they are now, from the point of view of the sun getting access to the buildings. There was another point which I would like to refer to, and that is based on the reports regarding the analyses of air. I contend, sir, that the figures given are only figures, because the proportion or the amount of CO₂ contained was compared with certain other buildings, but we know nothing of the time of the year or what these rooms were used for, nor have we any other information to show that it was a fair comparison.

10. That is the English barracks?—Yes, sir.

11. One sample taken from what is called the Artillery No. 1 floor contained 1 per cent.?—Yes; but the point I wish to make is this: that in the light of recent knowledge and the experiments made by Professor Leonard Hill, F.R.S., it is shown that the consideration of the amount of CO₂ is only of value when considered with regard to the temperature and moisture. He made experiments which go to show what I think is common knowledge. Supposing you have in a picture-theatre a certain excess amount of CO₂ present, and a certain temperature and moisture, some person may faint. Leonard Hill's experiments went to show that if you kept the temperature low, with the same amount of CO₂ present, no one would suffer. So that the mere amount of CO₂ is not so important. If you read the reports of Scott's Antarctic Expedition you will see that the men must have breathed an amount of CO₂ which is regarded by authorities as being impossible. Further, an Esquimaux's hut would look to us like the Black Hole of