

74. And was the thermometer washed?—Yes; it was sterilized every time.

75. *Mr. Salmond.*] What doctor was it?—I think it was Dr. Ferguson.

76. Was it the same doctor you saw next morning?—No; it was a different doctor next morning.

Dr. FRENGLEY further examined. (No. 132.)

1. *The Chairman.*] I understand that you wish to make a short statement about the hutments?—Yes. When the first hutment was put up it was built purposely for criticism, on the suggestion of one of the members of our Board. The result of the criticism was that the space provided for eave ventilation was reduced from 6 in. to 4 in., and the gable ventilation and the method of through ventilation by means of expanded metal between the two sections of the hut was cut out, on the ground that there was too much ventilation through the louvres provided. When considering the plan I myself noticed that the huts put up for Kitchener's army and for the Canadians did not show any roof ventilation. They showed under-gable ventilation by louvres, just as we put into these huts, and which we were asked to leave out on account of there being too much air. The question of the aspect was very fully considered. I myself, on the occasion of our visit to the camp, at just 12 o'clock in the day, drew my colleague's attention to the shadow caused by a post just at the guard, giving us a very good idea of the direction of the sun. Another point was in regard to the prevalent wind. Our standard work, "Theory and Practice of Hygiene," by Notter and Firth, says, "Like permanent barracks, they [that is, the huts] are best placed in echelon to receive the full advantage of winds." The huts as we put them are between north-west and south-east, so that standing between the huts you get the north-west wind blowing right down between them. I hold, therefore, that the idea that microbes and other things will pass from one hut to the other as being extremely unlikely, if not impossible. With the south-west winds it is possible that air from one hut will blow towards the other; but with regard to the conveyance of infection through the air the tendency of medicine at present is to regard air as a conveyer of infection as of no account. In former years scarlet fever, measles, and other infectious diseases were regarded as being carried by the air, but that is not the present view. For the information of the Commission on this point I would quote the opinion of Dr. Chapin, an American Health Officer of considerable standing, if not the most prominent Health Officer in America. He says, "There is no clinical evidence that common diseases are air-borne. Animal experimentation indicates that tuberculosis and anthrax may be air-borne. While it is not possible at present to state with exactness the parts played by aerial infection in the transmission of the different infectious diseases, we are by the evidence forced to the conclusion that the current ideas in regard to the importance of infection by air are unwarranted. Without denying the possibility of such infection, it may be fairly affirmed that there is no evidence that it is an appreciable factor in the maintenance of most of our common diseases."

2. You say that if these huts are not absolutely orientated by the sun they are by the wind?—Yes, sir, by the prevailing wind. Further, I wish to say that I do not regard the huts as being so near to one another as to be of any consequence, and even if there were no wind we could disregard the possibility of aerial conveyance. I know that some one has been making a picture showing microbes travelling out from one hut and into the eaves of the next one, and so on, and Mr. Bates did refer to the possibility of one hut at the end of a line containing the worst air of the lot. The reason for having them in echelon does not seem to apply here, since we have a very prevalent north-west wind. Then, there is another point I wish to refer to, the joining of two huts together. That too was considered, and with regard to the prevalent wind. Separating those two huts for 20 ft. or more, with the space running at right angles to the prevalent wind, did not appear of any sufficient value. Another point is that on the night I visited the huts, though it was a calm night and there was some evidence of overcrowding, in no one case did I find a door open. There is a tendency to disregard doors and windows as means of ventilation, and that I think was the case when Mr. Bates made his investigation—he found the windows were not in use. Then, regarding the capacity of the huts, I have informed the Commission that I regarded those huts as sufficient for accommodating fifty healthy persons, and I hold that one is justified in considering that more healthy persons can occupy a certain space than when sick. Colonel Firth, in his "Military Hygiene," says, speaking of the marquee tent, "It gives about 375 square feet of floor-area and some 3,200 cubic feet. It is intended really for sick men, and can accommodate eight of these, or sixteen healthy men." That gives the same cubic feet as we have in our huts. I hold that it is reasonable to put a greater number of healthy men in such a building than you would put sick men. I myself supported the recommendations which have since been made by the Medical Board to reduce the number of men to thirty, because of the reason that we have now a serious infectious disease amongst our men, and it is unwise at the present time to regard any single one of them as healthy. As to the text-books, I endeavoured to show how all standards of air-space vary. There is no definite foundation for them. They change about, as Colonel Firth himself quotes 500 ft. for barracks and then 400 ft. for huts. My colleague, Mr. Morton, has asked me to refer you to a later book than that. This work is called "Municipal and Sanitary Engineering," by W. H. Maxwell, A.M.Inst.C.E., and J. T. Brown, M.R.San.Inst. It is dated 1910, and consequently it is more recent than Firth's book. Under "The camp space" it says, "Owing to physical difficulties connected with the locality this is subject to variation, but the main principle to be borne in mind is that each tent or hut should be separated from its neighbour by an interval equal to its own height. The risk of camp life, however, lies not so much in excessive density of population on the gross superficies as in overcrowding of individual tents or huts." Now, I would ask you to notice what he regards as overcrowding: "So far as possible each occupant of a tent or a hut should be allotted an available space of 20 square feet in order to minimize the facilities for direct infection from man to man which camp life does so much to foster." And that article,