

6020. That is a low proportion?—It is a low proportion; but I see that the Herbert Commission, that sat to inquire into the Herbert Hospital, came to the conclusion that the amount for each bed should be 87 square feet; and in the new hospital build at St. Marylebone the square feet per bed is 72. Still, that is a very low average.

6021. *The Chairman.*] Have you got the figures of that report?—Yes; but I think that was calculated on the basis of seventeen patients in a ward, and now there are fifteen patients in the lower wards. In the upper wards there were seventeen patients, and now there are sixteen. I think the 79 square feet was worked out by Dr. Lindo Ferguson. In an ideal hospital the more floor-space you can get, taking economy of administration into account, the better. For instance, if you could get a floor-space of 150 square feet, and the public were willing to pay for it, I would have it; but with what we have I think success can be insured, with great care.

6022. *Mr. Chapman.*] Now, as to the cubic space per patient?—The cubic space per patient necessarily follows upon the floor-space, and I do not accept the cubic space given in Dr. Lindo Ferguson's paper as being a fair average. He calculates on the capacity to a certain height in the wards. I take to the highest point of the windows.

6023. Then, you are of opinion that it does not require an absolute limit—12ft. or about, it is—above which you are not to go?—No.

6024. You take to the top ventilation?—Yes, to the top of the ventilation outlet.

6025. In that do you find yourself borne out by authorities?—The method on which this calculation is based is that adopted in the Army and Navy Hospitals.

6026. What height have they given to the wards in Wellington Hospital?—I do not know.

6027. If the ventilation outlet is in the ceiling it gives you the whole space?—Yes; and I may mention that if you will consult an original paper by Parkes in the *Medical Journal* for 1867 and De Chaumont in the *Proceedings of the Royal Society, London*, for June, 1875, and the succeeding paper by Burke before the Massachusetts Board of Health, you will find that the ventilation outlet is the guide to the calculation of cubic space.

6028. Then, you have reckoned it in this Hospital to the top of the windows?—To the top of the ventilation outlet.

6029. What is the height of that?—In the lower wards 15ft.—1ft. more than is calculated in Dr. Lindo Ferguson's paper. Then, in the upper wards it is 1ft. 5in. from the top of the ceiling, and the height of the ward is 14ft. 11in.

6030. The lower wards?—The height of the wards is 16ft. 2½in., and the height of the windows above the floor is 15ft.

6031. Parkes and De Chaumont are original authorities on the subject of hygiene?—They are recognised authorities. On the basis mentioned I take the cubic space of No. 7 ward as 20,600 cubic feet. I deducted from that the cubic space of the watercloset tower. I deducted sixteen beds, and deducted for twelve men and for the chimney, but not including the attendants. That would give a cubic space of 1,675 per person for twelve beds. For thirteen patients, 1,546 cubic feet; for fourteen patients, 1,435 cubic feet; for fifteen patients, 1,340 cubic feet; for sixteen patients, 1,256 cubic feet, leaving out fractions. Now for No. 1 ward, a tower ward, I calculated the gross cubic capacity of the ward, without reductions, at 21,567 cubic feet deducting 379 for the watercloset—

6032. They give a method of measuring the cubic space that does not eliminate length?—At page 179 of De Chaumont I find this: "The three dimensions of length, breadth, and height are simply multiplied into each other. If a room is square or oblong, with a flat ceiling, there is of course no difficulty in doing this, but frequently rooms are of irregular form, with angles, projections, half-circles, or segments of circles. In such cases, the rules for the measurement of the areas of circles, segments, triangles, &c., must be used. By means of these, and by dividing the room into several parts, as it were, so as to measure first one and then another, no difficulty will be felt. After the room has been measured, recesses containing air should be measured, and added to the amount of cubic space; and, on the other hand, solid projections and solid masses of furniture, cupboards, &c., must be measured, and their cubic contents (which take the place of air) deducted from the cubic space already measured. The bedding also occupies a certain amount of space. A soldier's hospital mattress, pillow, three blankets, one coverlet, and two sheets will occupy almost 10 cubic feet, about 7 if tightly rolled up. It is seldom necessary to make any deductions for tables, chairs, and iron bedsteads, or small boxes, or to reduce the temperature of the air to standard temperature, as is sometimes done. A deduction may be made, however, for the bodies of persons living in the room; a man of average size takes the place of about 2½ to 4 cubic feet of air (say three for the average). In linear measurement, it is always convenient to measure in feet and decimals of a foot, and not in feet and inches. If square inches are measured, they may be turned into square feet by multiplying by .007. . . . The cubic capacity of a hospital marquee must be got by dividing the marquee into several parts. First, into bodies; second, roof: (1) body, as a solid rectangle, with a half-cylinder at each end; (2) roof, solid triangle, and two half-cones. The total number of cubic feet, with additions and deductions, must then be divided by the number of persons living in the room: the result is the cubic space per head."

6033. *The Chairman.*] In the previous case, how much for the tower?—350 cubic feet.

6034. And for the twelve beds?—36 cubic feet; and for the chimney space 60 cubic feet. In the tower ward, I deducted for the watercloset tower 379 cubic feet; for the press in the ward, 72 cubic feet; for fifteen beds, 45 cubic feet; for the occupants, 45 cubic feet; for the chimney, 104 cubic feet; and for contingencies, such as presses, and one thing and another, 117 cubic feet; which, deducted from the total, left a net cubic capacity of 20,800 cubic feet.

6035. *Mr. Carew.*] That is, allowing 3 cubic feet for each bed?—3 cubic feet for each bed.

6036. Parkes allows 7 cubic feet for each bed?—Not in my edition of Parkes.

6037. *The Chairman.*] Did you measure the beds?—No, I did not.