

B. *Over-crowding.*—The Passengers Act requires for each adult 18 superficial feet clear: each child above one year and under twelve is reckoned as half an adult; each child above twelve is reckoned as an adult. By the wisdom of Parliament, a child under a year old is supposed not to require any breathing space at all; at least it is allowed none. We were berthed for 318 statute adults: 168 single men, 46 single women, and 104 married couples and children. The total length of the "tween-decks" appropriated to the emigrants is 1,503 feet, the average width is 32 feet 3 inches; this gives a total area of 4,843 superficial or square feet. From this has to be deducted a storeroom for the food of some birds sent out to the Canterbury Acclimatization Society, and which is very improperly situated in the "tween decks." This place is 5 feet by 5, and would thus be a deduction of 25 square feet from the area appropriated to the emigrants, leaving a net area of 4,818 square feet; this, divided by 18, gives a quotient of  $267\frac{2}{3}$ , the total number of statute adults we ought to have carried, and fifty less than the number we brought. Now 18 superficial feet, with "tween decks" 8 feet high, gives a space of 144 cubic feet for each adult, an amount which every one knows is not half the very lowest requirements of the common lodging-houses. When, however, we come to diminish this very inadequate quantity by one-sixth, and when into one compartment above seventeen children under one year old are thrust without any provision for their breathing, it is evident that every condition was present to generate disease, and that disease must occur. But this was not all, though not only were the people unhealthy to begin with, the children especially being sickly, but the berths were all placed so as to be closed completely at one end by the sides of the ship or by the bulkhead, leaving one opening for the entrance of air. In the married compartment, even this opening was closed by a curtain. To this fatal curtain I attribute most of the deaths among the children. The habits of the people of the class from which these emigrants are taken is to shut themselves in as closely as possible at night, with every door and curtain closed round their beds. In spite of all remonstrances, they persisted in doing this on board; and thus two adults and, in seventeen cases, an infant as well, were shut up all in a closed box 3 feet wide,  $3\frac{1}{2}$  feet high, and 6 feet long, containing at the outside 83 cubic feet; or, deducting the space occupied by their bedding and their bodies, probably not more than 56 feet. In this worse than "Black-hole of Calcutta" they have been thrusting themselves every night, and, not content with the curtains, many hung up clothes the more effectually to exclude every access of fresh air. Of course, if the whole of the emigrants had drawn these curtains, they would all have been found dead in their berths together the morning afterwards. A considerable number—perhaps half—not only left the ends of their berths open, but slept with their heads at the open end.

C. Another thing which contributed to the origination and spread of disease was the dirty habits of some of the emigrants. I had the greatest difficulty in getting the married compartment cleaned properly, and it was not until I threatened to change the berths of all the dirty people and put them all on one side, and divide them into new messes, to be called "Dirty Mess" No. 1, 2, 3, &c., that I succeeded in getting proper cleanliness. Even this, however, could only extend to the washing of the decks and berths, and airing of the bedding. I am sorry to say that as regards personal cleanliness the exhortations I gave were fruitless. I believe that not one of the married women has had the whole or the greater part of her body washed for nearly three months. I set apart two hours in the afternoon twice a week during which the married women were to have all the compartment to themselves, and all the men were to go on deck, so that the women might wash themselves all over at least twice a week. I regret to say that except on the first day, when I myself cleared the men out of the place, the women have never once availed themselves of this opportunity. The prejudices of the people against fresh air are so great, that even in the tropics, although we had awnings spread over the main deck, only a minority could be induced to sleep on deck, the majority preferring the hot berths below. Nevertheless the relief afforded by this detachment sleeping on deck was so great that it put an end to the diarrhœa as an epidemic, for not only did those children who slept on deck recover rapidly, but those below, having a purer air to breathe, improved.

To show how completely these children were poisoned by foul air, I may mention the case of Henry Smith. This child had been long suffering from diarrhœa; one night the child seemed so low that the parents thought he was dying, and sent for me. I had before begged them to take the child on deck at night; the father was willing, but the mother would not consent, protesting that she would not have her child "killed" by the night air. However she placed the child under the skylight, where the night air came down on him more than if he had been under an awning on deck. The result was that at 3 a.m., when I went below to see whether the child was dead or alive, I found it so much better that the parents had put it into the berth, and gone to bed themselves. In spite of this example of the benefit of the pure air, the mother would never take it upon deck after nightfall, and in a week the child died—killed simply and solely by foul air.

D. *Cause of the Epidemics.*—I cannot attribute them to the water; the tank water was rusty and dirty in appearance, but I have no reason to think that this water, which was delivered by one of the London Water Companies, had received any previous sewage contamination. I tried to make microscopical examinations of it, but on the few occasions when I had leisure to use the microscope, I was unable in consequence of the rolling of the ship to make any examination of sufficient accuracy. It is pretty clear, however, from the mode in which the epidemic gradually grew and developed itself, that no agency acting so universally as the water could have been at fault.

The typhoid epidemic was much more extensive among the single men than any other class, there having been among the cases a large majority of single men, although they do not form one-half of the emigrants. This I believe to have been owing to the fact that the fore-hatchway affording the principal entry for air to their compartment, was situated between the two water-closets for men, and just in front of a pigstye, which at the first part of the voyage was very offensive; afterwards, on my urgent remonstrances, it was washed out more frequently. The indraught of air, as the vessel went forward, would of necessity draw in the emanations from these sources. Now, when it is remembered that there were upwards of 200 men, and only six closets, or rather two closets with three seats each, it must be obvious that some persons are constantly using the closets, and therefore that fœcal smells must be constantly proceeding therefrom. The construction of the closets is the worst I ever