

passenger ; and if the distributing pipes were put into every part of the ship while it was being built, the cost would not be appreciable.

Moreover, such a fan blower would almost save its cost in a single voyage, for it could be utilized while the ship was loading grain, in doing all the trimming, which, on account of the dust, is a very unhealthy, and, consequently expensive operation. By means of a hose pipe attached to the fan blower the grain could be driven with great force away from the delivery pipe of the elevator, without a single man going into the hold.

Owing to the large development of the cattle trade during the last few years, the necessity for better ventilation is more than ever felt. Although the steamship companies do all in their power to have the steerage compartments thoroughly cleansed, still with the present system of ventilation it is impossible to completely get rid of the smell. Many emigrants have told me that the smell of cattle carried on the previous trip, added to that of the closely packed and half suffocated passengers, was simply horrible.

In view of the immense emigration now being directed towards our shores, and the responsibility which devolves upon us of seeing that the emigrants are provided for after their arrival ; and considering how important it is that they should arrive here in a healthy instead of in a sickly condition, and in view of the light which science has shed upon the requirements of human life, it becomes a question whether the time has not already arrived for our Government to make such representations to the Imperial Board of Trade as will lead to a change being made in the Merchant Shipping Act, whereby a definite minimum amount of fresh air would be provided for every statute adult on board, instead of that important point being left as now to the discretion of the emigration officer at the port of embarkation.

The quantity of fresh air to be furnished to the occupants of the cabin and staterooms may safely be left to the force of public opinion, but I venture to predict that the company which would make a decided advance in this regard, would make a rich return for the small amount of money so invested. The travelling public would not be slow to appreciate the effort to supply them with a sufficient supply of the first necessary of life.

As a natural sequence to the first portion of my paper, I wish to call your attention very briefly to the question of warming and cooling the air which might be so plentifully provided by the above mentioned method.

There is no doubt that during several months in the year a great deal of real hardship and suffering is experienced by the emigrants and seamen who cross the Atlantic, owing to the absence of any regular system of heating.

During the time I was connected professionally with the Marine and Emigrant Hospital, Quebec, and other institutions, I have had hundreds of opportunities for observing the amount of sickness, suffering and death, especially among young children, directly traceable to the cold experienced on board ship during a Winter voyage.

Indeed any system of ventilation would be incomplete, unless combined with means of heating the air provided by it.

For the average emigrant or sailor would prefer to breathe the foulest of foul air, partially warmed, rather than the purest of pure air freezing cold. Indeed, scarcely a Spring passes without adding one or more to the list of sailors who have paid the penalty of their life for the warmth obtained from a charcoal pan. Nor would all this sickness and death be either difficult or costly to obviate if the method of ventilation which I have suggested were carried out.

"In the Insane Asylum at Kingston," Dr. Metcalf writes me, "the air passes in Winter over steam coils and becomes hot, the amount of heating to which it is subjected being regulated by adjustable valves." On steamers a zinc chamber or heater might be constructed around the boilers, through which the air could pass before being forced through the fan. Only in very cold weather would it be necessary to heat up the steam coils.

The openings for the admission of warm, fresh air should be near the ceiling, and the foul air openings near the floor, and these latter should be led into the smoke-stack or furnaces.

While the temperature on the Atlantic is generally too low, there are other voyages where the passenger is put to considerable discomfort from excessive heat. An eastern traveller in a recent paper states that average midnight temperature in the saloon and staterooms was one hundred and ten degrees F., most of the passengers preferring to pass the night on deck.