

in health. The sense of sight and smell will protect us from partaking of impure food or water; foul air, however, if present, we are compelled to breathe, and the fouler the air the faster we breathe it, the lungs endeavoring in vain to get their proper supply of air for carrying on internal combustion.

Medical authorities assert that an adult person passes through his lungs 15 cub. ft. of air per hour, and to maintain the standard of purity in the air this should be multiplied by 250, which gives 3,750 cub. ft. per person per hour; and if this volume is reduced, it can only result in reducing the energies of the workers, and thereby the output from each machine. A loom, a spinning, or a winding frame represents so much capital, and it is the chief aim to make capital earn interest, and from observations, I am satisfied that few things would add so much to the prosperity of our country as workrooms and factories well warmed and ventilated. The worst enemy germs and bacteria can meet with is a good supply of fresh air, and the reverse holds good. A workroom badly ventilated is the best place for cultivating the germs of disease.

The importance of fresh air was recognized nearly one hundred years ago in connection with the textile trades, as we see by referring to the Act of Parliament, 1802. The first clause states that openings shall be made through the walls of the mills, so as to ensure a good supply of fresh air to the workers. Still, how little has been done comparatively? We see in the Cotton Cloth Factory Act of six years ago that not less than 600 cub. ft. of air per head per hour must be supplied, and a year or two later the same rule came into force for spinning-rooms. We, however, find that six times 600 cub. ft. are necessary, and in the next legislation on the subject we shall probably find the volume of air not specified, but what is of more importance, the quality, which will necessitate about 3,000 cub. ft. of air per hour being supplied. Our factory inspectors are now doing more in seeing to the sanitary conditions of our factories being attended to, and the following extracts from the reports of 1896 are worth notice:

One states. "I have been unable to get much good effected in the way of ventilation, I am afraid, by ordinary or natural means, for in most instances the results do not tempt an inspector to press the matter.

"Manufacturers, after all these years of apathy, are beginning to find that ventilating fans are really in the long run economical. One or two, who have begun with an 18-inch fan as an experiment, have ended by fitting them in almost every room. In all cases I have the same reply when visiting after one has been fitted: 'I do not know how we lived before.' For extracting dust, gases, fumes and hot air, they are invaluable in my experience. Considering that fans are now very reasonable in cost and do not require much power to drive them, it seems incredible how ignorant most occupiers are of their use, and how reluctant at first to introduce them. The increased activity and healthy look of the workers in a well-ventilated factory must compare favorably with the languid and pallid appearance of those in a close and defective one. I consider no method for the ventilation of factories can

approach that of H.M. superintending inspector, Mr. Osborn. In practice, his system has been found in every way satisfactory, and what applies to cotton-weaving sheds and flax-preparing rooms, applies pretty much to other industries. A number of small fans running at not too high a velocity are far better than one large one. The latter always tends to cause strong currents, amounting to draughts, in its vicinity, and seems to feed itself from the nearest inlet, or perhaps door, whereas the distant parts of the room remain unaffected.

"Very few who introduce exhaust fans provide for their being 'fed'—that is, for inlets to supply them being fitted—till pointed out. These inlets should be of almost the same area as the combined fans, and placed at the opposite side of the room, about 7 feet from the floor. Air space is not ventilation, but only a provision rendering ventilation possible. The 250 cubic feet per head is, per se, a sufficient supply of fresh air for a few minutes only. Vitiated air has to be constantly removed and fresh air constantly brought in in adequate volume, without undue exposure of the inmates of the room to the current."

Another inspector points out the absurdity of providing inlets without outlets, or vice versa. In many places no attempt seems to have been made to ventilate, and in others a hole, often without a grating even, is made through the wall near the top of the room, and this and the windows, "which are made to open," are shown to you as ventilators. In contrast to this there is a clothing factory where, I am informed, £3,000 was spent in ventilating the workrooms, and with very marked success.

And, yet again, one firm have had a highly satisfactory system of ventilation fixed in their various mills. They have not only placed fans in each room, but have erected a fan in each closet shaft. This is an admirable system, and prevents the other fans from drawing their air supply from the closet. I have often visited the rooms, but always found them free from effluvia in consequence of the efficiency of the closet fans. The head of the firm informs me that this is the most profitable outlay on their premises, as the health of their workpeople is more assured; they are also able to produce more work, and of a higher quality, through the improved health of the operatives. Since the erection of these fans I have been able to influence other occupiers in the silk trade to adopt the system of mechanical ventilation.

Another inspector states that "in the Liverpool district a great deal has been done during the year by way of ventilation through fans, cowls, etc. In one case where an order had twice been given and neglected, proceedings were taken and a fine inflicted, with the somewhat curious but satisfactory result that the occupier has since given a testimonial to the erectors of the fan expressing satisfaction at the wonderful improvement in the atmosphere of the works." Another states: "I am constantly hearing the remark that in summer the windows are frequently open, and it appears to be a popular notion that in bad weather and winter (the time when most gas is burnt) human beings can dispense with the luxury of clean air