

the growth of micro-organisms. Or perhaps the growth of the latter may be prevented by the greater dryness of the rooms mechanically ventilated.

Let me refer to one or two further points before leaving the subject of school ventilation. We classified the schools according to the cubic space per child at the time of our visit. It will be seen that increased cubic space up to 300 cubic feet brought with it no diminution in the pollution of the air. With mechanical ventilation, on the other hand, there was a diminution, at any rate in the number of micro-organisms, with increase of cubic space.

Cubic space per person	Naturally ventilated				Mechanically ventilated			
	No. of cases	Carbonic acid	Organic matter	Total micro-organisms	No. of cases	Carbonic acid	Organic matter	Total micro-organisms
Cubic feet								
50-100	6	21.5	16.2	119	7	14.0	7.8	23
100-150	14	15.5	19.6	128	8	11.4	9.6	14
150-200	5	18.9	12.3	150	5	11.8	12.3	10
200-250	9	21.1	16.8	188				
250-300	4	17.1	9.5	187				
300 and upwards	4*	15.1	11.8	12	6	13.0	3.7	2

\* Three of these were in a private school

We also divided the naturally ventilated schools we examined into two classes, according as they were heated and ventilated by fires or by hot pipes respectively: and we obtained the following results. The data for mechanically-ventilated schools are added for comparison.

Description of School	No. of rooms examined	Carbonic acid	Organic matter	Total micro-organisms
Ventilated mechanically, and heated by hot air blown into the rooms	20	12.3	10.1	16.5
Heated by fires, and ventilated in the ordinary way	18	16.9	15.7	169.
Heated by hot pipes in the room itself, and ventilated by windows, ventilators in the room, and in some cases by a few small Tobin's tubes.	21	20.0	16.5	92.

The following table shows the result of a comparison of a number of pairs of rooms. The rooms in each pair were as similar as possible in every respect (such as age of children, &c.) except that one was occupied by girls and the other by boys:—

No. of rooms compared...	Space per person	Temperature (°Fahr.)	Carbonic acid	Organic matter	Micro-organisms
	30	57	20	16	30
Boys .....	275	60	15.0	7.9	92
Girls .....	382	58	12.3	6.7	65

The general result of our investigations has, I think, revealed a state of matters in schools urgently calling for improvement. The amount of loss of life and death resulting from the vitiated state of air is, in all probability, enormous. Captain Douglas Galton dealt with this subject in his admirable inaugural address at the Newcastle Congress of this Institute. Let me only recall one of the facts mentioned by him: that the mortality among teachers in elementary schools was found to be about 20 per 1,000, as compared with five per 1,000 in two classes where the average age was presumably about the same—the police and navy—and 3 per 1,000 amongst prisoners.

We can afford to provide abundance of fresh air for criminals, and surely we might do as much for our children. It is not only abundance of ventilation that is required for keeping the air of rooms pure, but the room itself must be prevented from becoming contaminated with dirt. For this both personal cleanliness is required, and the means of keeping the room itself and everything underneath and about it absolutely clean. I do not doubt that engineers and architects can devise not only satisfactory and sufficient methods of ventilating and warming schools, but also floors which will be incapable of becoming polluted in the manner just referred to.