

or 100 children, there can be no doubt that pure air heated by a furnace is the best and cheapest method. But there are comparatively few such schools except in large and populous cities, where, we believe, this method is generally adopted.

In the generality of schools, however, the heating is either by means of an iron stove or of a common open fireplace.—And the question here naturally arises, Which of these means is to be preferred? We have no hesitation in stating in reply that, in our opinion, the iron stove is on the whole the preferable mode. It is, in the first place, much more economical than the open fireplace as ordinarily constructed. Where the latter is used, it has been estimated that nine-tenths of the heat evolved ascends the chimney, and only one-tenth is radiated from the front of the fire into the room. Besides, fourfold more fuel is required to warm a room by a fireplace than when a stove is used. Oxygen is of course consumed in a like proportion, and hence, when an open fireplace is used, there is necessarily a fourfold greater ingress of cold air to supply combustion than when a stove is employed. And what is of still greater importance, when a common open fireplace is used, it is next to impossible to procure a uniform temperature throughout the room. The cold air will be constantly rushing through every crevice at one end of the room to supply combustion at the other end, so that the scholars at one end will be suffering from cold, while those at the other will be oppressed with heat. All this may be obviated by the use of a stove. It can be easily set in a central part of the room, whence the heat will radiate, not in one direction merely, but in all; and if only one-fourth as much air is required to sustain combustion, as in a common fireplace, it will be readily perceived how a much more even and uniform temperature can be maintained.

But, notwithstanding the obviousness of all these statements, it is the opinion of some that iron stoves in school rooms are unhealthy; first, because they contaminate the atmosphere by reason of the carbonic acid that is emitted, and, secondly, because the aqueous vapour existing in the atmosphere, in its natural and healthful condition, is dispersed, and the air of the room becomes too dry. These are no doubt great evils, and were there no means of averting them would militate very strongly against the use of stoves in schools, or in any other apartments. But they can be very easily guarded against.—To prevent the air in the room from becoming too much carbonized, all that is required is attention to the matter of ventilation, and this is indispensably necessary for the benefit of all, whatever is the kind of warming resorted to. Again, to supply the deficiency of the aqueous vapour, it is only necessary to place an evaporating dish, partially filled with pure water, on or near the stove, care being taken that this evaporation is not too copious, but in meet adaptation to the dimensions of the apartment.

It is clear, then, that the objections sometimes urged against stoves are altogether groundless—that they refer more to their abuse than to their legitimate use, and that they may with equal propriety be brought against any other means of heating, when that means is not properly attended to; and, therefore, that the position we have taken regarding the means of warming the school is a sound and safe one, that the stove is at once the best and cheapest in securing a uniformity of temperature.

In order to the accomplishment of all this, however, three things are indispensably necessary: First, The stove must be

of the best construction; and, in size, adapted to the room it has to supply with caloric,—and the doors, the hinges or latches, and the pipes, must all be in good order. Secondly, The wood must be well seasoned and protected from the weather by a suitable wood-house. The principal reason why the stoves in our school-houses are so cracked and broken, and why the pipes are so rusty and open, lies in the circumstance that green wood, or that which is partially decayed or saturated with moisture, is used for fuel. There are at least three reasons why this is poor policy: 1st. It takes double the amount of wood. A considerable portion of the otherwise sensible heat becomes latent in the conversion of ice, snow and moisture into steam. 2dly, The steam thus generated cracks the stove and rusts the pipe, so that they will not last one half as long as if dry wood from a wood-house were used. 3dly, It is impossible to preserve an even temperature. Sometimes it is too cold, and at other times it is too warm; and this, with such means of warming, is unavoidable. It is thus clearly the interest, as well as the duty, of the Trustees of the school, not only to provide a thoroughly tight stove, but to see to it that an adequate supply of well-seasoned wood is stored up.

3. Another requisite for the securing and the preserving of an even temperature in a school, is, to use every means to prevent the admission of cold air through cracks or defects in the floor, windows and walls, causing it, even when stoves are employed, to be colder in the outer portions of the room than in the central portions and above the stove. This evil may be almost entirely obviated by a very simple arrangement, which will also do much to render ventilation at once more effectual and safe, especially in very cold and inclement weather. The arrangement is as follows:—Immediately beneath the floor—and in case the school-house is two stories high, between the ceiling and the floor above—insert a tube, from 4 to 6 inches in diameter, according to the size of the rooms, the outer end communicating with the external air by means of an orifice in the underpinning or wall of the house, and the other, by means of an angle passing upward through the floor beneath the stove. This part of the tube should be furnished with a register, so as to admit much or little air, as may be desirable. This simple arrangement will reverse the ordinary currents of air in a school room. The cold air, instead of entering at the crevices in the outer part of the room, where it is coldest, enters directly beneath the stove, where it is warmest. It thus moderates the heat where it enters, and, mingling with the heated air, establishes currents towards the walls, and gradually finds its way out at the numerous crevices, through which the cold air previously entered. If these are not sufficient for the purpose, several ventilators should be provided in distant parts of the room. This simple arrangement, then, provides for the more even dissemination of heat through all parts of the room, and thus secures a more uniform temperature, and, at the same time, provides a purer air for respiration, contributes greatly to the comfort and health of the scholars, and fulfils several important conditions which are essential to the most successful prosecution of their studies, and to the maintenance and improvement of social and moral, as well as intellectual and physical, health.