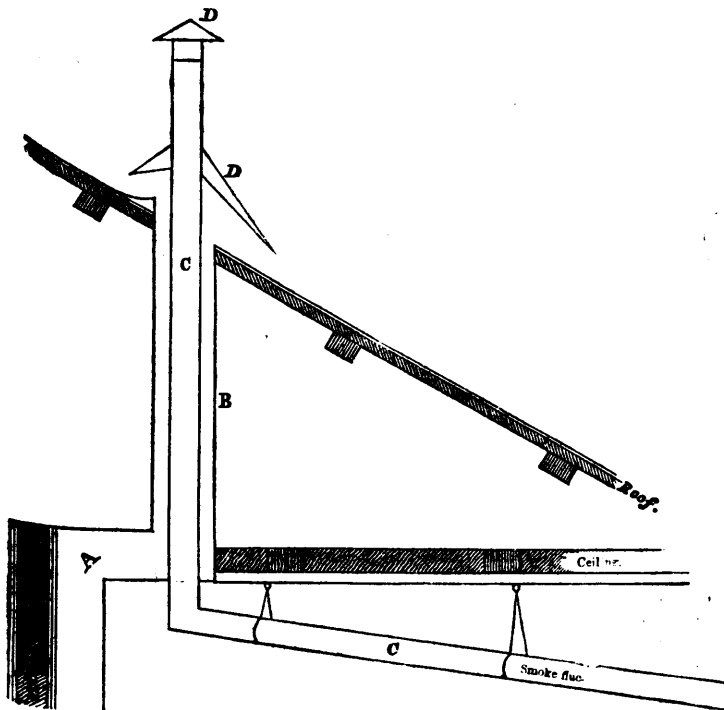


FIG. 3.
VENTILATING APPARATUS.

(Scale 4 feet to the inch)

- A. Air box, 1 foot square, or 24 inches by 6, covered by the plaster, and opening at the floor, in the base of the plaster.
 B. Round iron tube, 15½ inches in diameter, being a continuation of the air box, through the centre of which passes,
 C. The smoke flue, 8 inches diameter
 D. Caps to keep out the rain.

vitalized blood, or the newness of life with which nerve, muscle, and mind were endued by free exercise in the open air at the recess, and the close of the school? Let any one who is sceptical on this point visit the school of his own section, where his own children perhaps

ally by the younger children, and exhaustion and irritability of the teacher, a demonstration that the atmosphere of the room is no longer such as the comfort, health, and cheerful labor of both teacher and pupils require.

EFFECTS OF BAD AIR ON THE HEALTH OF TEACHERS AND PUPILS.—In this way the seeds of disease are sown broadcast among the young, and especially among teachers of delicate health. "In looking back," says the venerable Dr. Woodbridge in a communication on school-houses to the American Institute of Instruction, "upon the languor of fifty years of labor as a teacher, reiterated with many a weary day, I attribute a great proportion of it to *mephitic air*; nor can I doubt, that it has compelled many worthy and promising teachers to quit the employment. Neither can I doubt, that it has been the *great cause* of their subsequently sickly habits and untimely decease." A physician in Massachusetts, selected two schools, of nearly the same number of children, belonging to families of the same condition of life, and no causes, independent of the circumstances of their several school-houses, were known to affect their health. One house was dry and properly ventilated—the other damp, and not ventilated. In the former, during a period of forty-five days, five scholars were absent from sickness to the amount in the whole of twenty days. In the latter, during the same period of time, and from the same cause, nineteen children were absent to an amount in all of one hundred and forty-five days, and the appearance of the children not thus detained by sickness indicated a marked difference in their condition as to health.

The necessity of renewing the atmosphere, does not arise solely from the consumption of the oxygen, and the constant generation of carbonic acid, but from the presence of other destructive agents and impurities. There is carburetted hydrogen, which Dr. Dunglison in his Physiology, characterizes, "as very depressing to the vital functions. Even while largely diluted with atmospheric air, it occasions vertigo, sickness, diminution of the force and velocity of the pulse, reduction of muscular vigor, and every symptom of diminished power." There is also sulphuretted hydrogen, which the same author says, in its pure state, kills instantly, and in its diluted state, produces powerful sedative effects on the pulse, muscles, and whole nervous system. There are also offensive and destructive impurities arising from the decomposition of animal and vegetable matter in contact with the stove, or dissolved in the evaporating dish.

TWO OBJECTS TO BE ATTENDED TO.—The objects to be attained are—

FIG. 5.

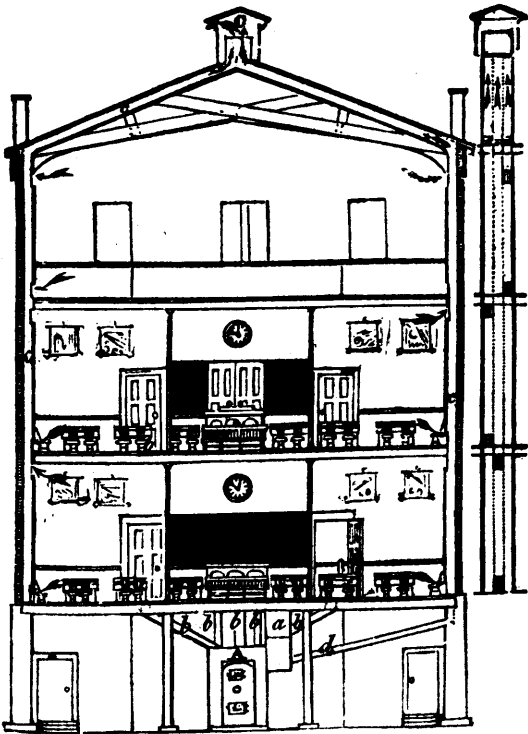


FIG. 4.—SECTION OF SCHOOL-HOUSE.

- F. Hot air furnace.
 a. Cold air ducts.
 b. Hot air ducts to the registry in the floors.
 c. Foul air ducts—the passage into, and through, which is indicated by an arrow.
 d. Smoke flue.

are condemned to a shorter allowance of pure air than the criminals of the State, and he cannot fail to see in the pale and wearied countenances of the pupils, the languor and uneasiness manifested, especi-

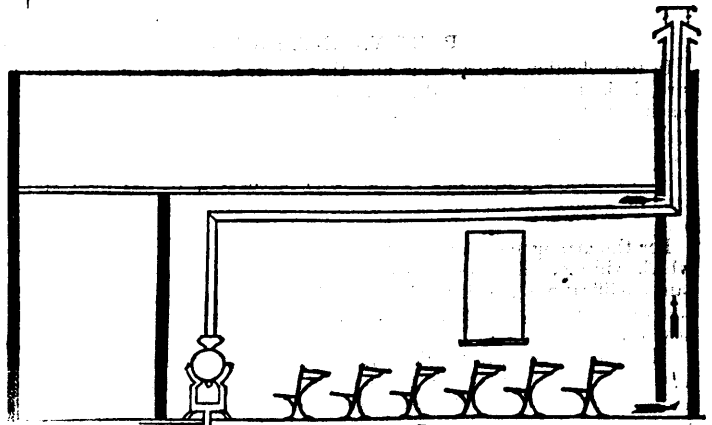


FIG. 6.—SECTION, WITH STOVE, ETC.—(See preceding page.)

the removal of such impurities, as have been referred to, and which are constantly generated, wherever there is animal life and burning fires, and the due supply of that vital principle, which is constantly consumed by breathing and combustion. The first can be in no other way effectually secured, but by making provision for its escape into the open air, both at the top and the bottom of the room; and the second, but by introducing a current of pure air from the outside of the building, warmed in winter by a furnace, or in some other mode, before entering the room. The two processes should go on together, i.e., the escape of the vitiated air from within, and the introduction of the pure air from without. The common fire-place and chimney secures the first object very effectually, for there is always a strong current of air near the floor, towards the fire, to support combustion, and supply the partial vacuum in the chimney occasioned by the ascending column of smoke and rarified air, and in this current the carbonic acid and other impurities will be drawn into the fire and up the chimney. But there is such an enormous waste of heat in these fire-places, and such a constant influx of cold air through every crevice in the imperfect fittings of the doors and windows, to supply the current always ascending in the chimney, that this mode of ven-