Heating and Ventilation.

(By W. F. Vanbuskirk, A. M., C. S. C. E.)

Now that the cold weather appears to be about over and medical and fuel bills are about due, it may be of interest to enquire into some of the causes that necessitate this extraordinary expenditure. I am inclined to think that much money and bad language can be saved by the proper construction and management of heating and ventilating apparatuses in schools, churches and other buildings.

Many of our public buildings are not only decidedly uncomfortable in cold weather, but are veritable hot-beds of disease. When we consider that human beings require from 1,000 to 3,000 cubic feet of pure air per hour, and that in most public rooms only a small portion of the required amount is supplied, the occupants being forced to breathe a mixture of pure and foul air, containing various poisonous gases, etc., such as carbonic acid, organic nitrogenous poison, carbonic oxide, hydrogen sulphide, etc., not to mention the germs of common diseases, we wonder no longer at the prevalence of colds, etc., and the chorus of coughs in church.

The woeful ignorance of the public, in regard to scientific methods of heating and ventilating, etc., can only be accounted for by the inordinate conceit of the average number of councils, school and other boards, who have grasped and digested in one supreme mental effort, without practical investigation or study, all that there is to know of science, and whom the ballot box has endowed in some supernatural way with a knowledge of engineering and architecture.

In any system of ventilation, worthy of respect, the heating and ventilation are so intimately connected that it is difficult to consider them separately, and it is not desirable to do so. The following outline of requirements refer to what is known as the natural, as distinct from the forced or mechanical method of ventilation, as the latter method is generally too expensive in first cost and operation for the ordinary public buildings of small towns. To obtain an approximation and uniformity of temperature in a room, air should enter in a current, to prevent stagnation and stratification, and in cold weather some means of artificially heating the current of air before entering the room must be provided.

The proper temperature of air in public rooms is somewhere about sixty-five to sixty-eight degrees farenheit, and there should be but a few degrees difference in temperature between air near the floor and near the ceiling.

Uniformity of temperature in all parts of the room is desirable and can only be obtained by a proper rotation of the mass of air, which is more easily accomplished when the incoming air is only moderately heated.

The immediate destination of warm air entering a room, is the ceiling. Therefore, it is desirable to get it there at once to preserve its purity and avoid inconvenience to occupants of the room. The inlet should be seven or eight feet from the floor on one of the inside walls, if possible, while the outlet should be immediately beneath, close to the floor.

By means of such location of vents a good draught is maintained in flues, since the inner walls are warmer and of more even temperature than the outer walls, and, as the warm air is lighter than that of the room, generally, it flows to the ceiling, outward to the cooler walls, falls slowly past windows and back across breathing line and floor to the outlet. Greater economy of heat is secured than if flues were in outer walls, and there is no chance of warm air escaping from the room until it has become somewhat cooled or vitiated.

Air should be conducted in large direct conduits from outside of building to heaters at base of warm air ducts supplying air to room, and so far as practicable, these conduits should be large chambers rather than cold air boxes, so that they will practically place the whole out-of-door atmosphere at the disposal of the heating and ventilating apparatus.

The columns of air should be controlled by valves between the heaters and rooms, rather than by dampers between heaters and outside air.

Warm air flues and inlet areas should be of such area as to allow a sufficient flow of air for ventilation when the outside air is at or near a temperature of fifty degrees farenheit, since they will be required for ventilating.

A ventilating apparatus should provide for the minimum difference of temperature between inside and outside air, and the heating apparatus for the maximum difference of temperature under which the systems are depended on. Means must, therefore, be provided for regulation of flow and temperature, according to condition of weather.

Diffusers should be provided at all inlets so that the centering current of air will be divided into several distinct parts, each having an independent direction, and allowing the fresh air to reach different parts of the room at once and reducing the draught effect of the solid column or current across the room.

The flues and outlet areas for discharging air must be larger than for supply, since the temperature is lower in cold weather and velocity of flow is correspondingly less, and since the work required to produce lost motion, caused by successive contraction and expansion of air channel, is considerable.

The system, as a whole, should be designed to suit the particular room or building, as what will do for one building will prove entirely inadequate for another.

The ordinary house furnace is not, as a rule, well adopted to the work of heating a public room or building as it is very seldom that one can be found capable of allowing the large amount of air necessary to be passed through it.

If a furnace is used it should have as large grate area as possible to insure the complete combustion of fuel. The area of heating surface should be larger, in proportion to grate area, than is usual, and the cross-sectional area between jacket and heater should be sufficient to insure the heating and passage of a large amount of air for ventilating.

An intelligent comparison of the conditions of service required with those which usually obtain, will convince most people of the desirability of reform in matters of heating and ventilating, and may possibly assist some board of health in perpetrating an experiment on the unsuspecting public.

Ineligible for Office.

The Dominion Government has passed an order-in council, prohibiting "all employees in the post office department, and the postmaster of incorporated towns," from seeking or accepting the municipal office of mayor, alderman, councillor or school trustees (public or separate).

The town council of Berlin has passed a by law to stop the roaming dog nuisance in that municipality. By its provisions all dogs must be tied up and not permitted to run at large until Sept. 1st. Anyone allowing his canine to run about is liable to have him destroyed by the town authorities. The intent of the by-law is to prevent gardens and lawns from being ruined by idle dogs.—*Exchange.*

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In the good roads agitation the main points are the bringing farmers closer to markets, economizing time and saving wear and tear of wagons and horses and drawing the agricultural community into closer touch with urban life.

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It may be of interest to our readers to know something of the Standard Drain Pipe Company. They have just increased their capital from $150,000 to $500,000. Notwithstanding the fact that they have enlarged yearly until now, and that after eight years' existence, the factory is eighteen times its original capacity, they are still unable to supply all demands, and purpose doubling its capacity, which will give them an output of nearly 3,000 carloads per annum. The present factory covers an area of 46,000 feet, two stories high, and has ten large kilns which are burnt weekly, and some of which hold sixty-five to seventy tons of pipes.