

## MUNICIPAL DEPARTMENT

### STONE IN STREET CONSTRUCTION.

Stone in various forms and conditions has been used for street and walk building during all ages, but it is not keeping pace at the present with the other material that is seeking favor for such purposes. As a metaling for city streets stone, except granite blocks, must give way, says a writer in Stone, but the employment of crushed stone for foundations and concrete will continue to be in demand, and the more so as its cost is reduced by improved facilities for its production.

There are many uses to which a finely ground stone can be put. As these are at present furnished as the tailings from the crusher or screen, they have too great a percentage of dirt and dust in it to give the desired results in its use, especially in finishing concrete work. If this could be blown or washed out cheaply, it would be of great value.

A valuable use to which stone might be more extensively employed in smaller city and town streets, is in gutter and curb work.

Large stone dressed so as to form a combined gutter and curb makes the most desirable roadway edging yet employed, but hardness of the stone suited for such purpose has caused such forming to be too expensive. The rapid introduction of stone working machinery will ere long accomplish this at a price to greatly extend its use.

Large flat stone or flagging used for gutter bottoms in connection with cedar block paving has the double advantage of adding durability to the paving in this, its weakest point, and further in reducing the area subject to the excessive swelling of blocks in wet and freezing weather. This action is one of the most destructive to the form of wood block pavements.

There is no more pleasing display of a moderate degree of artistic taste than in stone for curbing, steps and posts along the street lines. Engineers and architects might add greatly to the stone industry in this line by a little pains in introducing some original and unique forms and designs in these matters. This latter is not properly a part of street construction, but it is so closely related thereto that it should be looked after in connection with any such improvement, as much of this work is demanded at such times.

Stone for sidewalks being apt to wear smooth and become slippery in wet and freezing weather, should be laid with only sufficient slant to run the water toward the gutter.

These may require an occasional surfacing with the bush hammer.

One defect in stone walk laying is either in having the stone of too great surface, or else of insufficient thickness.

Limestone flagging as ordinarily laid

on a sand bed, will require about one inch in thickness for each foot of greatest dimension the stone has. This much is necessary to withstand the lifting and settling action incident to freezing and thawing.

Outside of much traveled streets, there is a universal tendency in winter to have a path cleared of snow along the center of the walk, which on warm days results in the thawing under the center of the stone, while under the ends it remains frozen. As the freezing again takes place, it will be more severe under this exposed center, resulting in an upheaval and consequent splitting of the stone at such point.

Proper drainage and good bedding of broken stone and clean sand, especially the latter, will largely remedy the above difficulty by providing an opportunity for the freezing action in the bedding to exert its expansive force in compacting the loose bed of sand instead of raising the stone.

Another matter of some annoyance in flagging stone, is the tendency of the roots of trees to penetrate beneath them, and by years of growth exert an unequal pressure on some portion of the stone. This can best be prevented by having a very clean, but well drained bedding for the stone, one in which the accumulating water therein will soon find an outlet in a gutter or drain near by.

### STATE REGULATION OF VENTILATION OF PUBLIC BUILDINGS.

The State of Massachusetts was the pioneer in the legal regulation of the ventilation of buildings, and the report of the Chief of the District Police, upon whom falls the enforcement of the laws, is always a document of public interest. The report for 1894, which has just appeared, is a volume of some 450 pages, together with numerous lithographic plates.

The report relates largely to the subject of ventilation and heating, the law demanding that "every public building and every schoolhouse be ventilated in such a proper manner that the air shall not become so exhausted as to be injurious to the health of the persons present therein." To the department has been left the responsibility of determining the minimum limit of proper ventilation, and they have compelled the supply of at least 30 cubic feet of air per minute per occupant. The effect of the law has certainly been to greatly improve the condition of all public buildings and schoolhouses, and the improvements introduced in those lately erected are most noticeable.

The reports of the various inspectors upon their work in the line of schoolhouse ventilation are pertinently introduced by several pages of general remarks upon the subject, showing conclusively the necessity of improved methods and most emphatically denouncing the toleration of anything but the best when that can be secured, for "filthy air is as disgusting as foul water and no more conducive to health."

The inspectors appear to be a unit in their approval of mechanical means, for "in the ventilation of buildings the natu-

ral methods of ventilation, owing to the varying conditions of temperature and barometric pressure from day to day, cannot be relied upon, as a change in the wind produces a stopping of the air in the flue. It has also been seen that when the weather is sultry and oppressive the atmosphere has not sufficient weight to disperse the air in the flues. Artificial methods or systems are now applied to secure the desired results. \* \* \* In some of the systems which have been applied to the school buildings in the state during the past few years good results have been obtained, and they have helped to solve the problem of heating and ventilation; but with those who have made a careful study of the laws underlying the whole process it is a settled conviction that perfect ventilation cannot be reached without the aid of mechanical means."

The inspectors, in the progress of their work, have found numerous old school buildings in which the air in occupied rooms was contaminated to the extent of 30 to 50 parts of carbonic acid gas in 10,000 parts of air, while in the new buildings they frequently report 6 to 8 parts in the same volume of air, and in some cases have measured an air supply of fully 50 cubic feet per occupant per minute.

### THE EFFECT OF CATCH-BASINS ON SEWER CLEANING EXPENSE.

This subject is discussed by T. Chalkley Hatton, engineer in charge of the Wilmington, Del., sewerage system, in a report issued recently. The streets paved with block stone, asphalt, or brick are 11.59 miles long, while of the remaining 71.41 miles of streets in the city only 26.63 miles have a cobble or broken-stone surface, which naturally results in considerable street detritus finding its way to the sewer inlet during storms. On one system of sewers where the inlets are turned into catch-basins nearly all the street washings were intercepted and the sewer has needed cleaning but once, which was done at a cost of \$67, the catch-basins have been kept clear at a cost of \$66 annually. On another system of sewers, located almost the same as the first as regards grades, nature of street surface, and relation to tide water, which have been finished but a short time, cleaning was soon required at a cost of \$144, and the sewers were as badly choked as before one week after the work was done, owing to lack of catch-basins. The first system drains an area of 120 acres, the second drains one of 28 acres.

A Mexican paper states that a new project for the sanitation of the sewers of the city of Mexico, at a cost of about £5,000, calls for the building of some twenty-five windmills in different parts of the city to rotate paddle-wheels in the sewers and quicken the current to 1 metre per second.

The highest death rate of any town in the civilized world is that of the City of Mexico—40 per 1,000. The city is 7,000 ft. above sea level, but in spite of this fact its defective drainage makes the mortality very great. Mr. Romero, the Mexican Minister at Washington, explains in a recent article that when the water in Lake Texcoco is high it backs up into the sewers until the soil under the houses and in the streets is saturated with sewage.