

MUNICIPAL DEPARTMENT

THE INFLUENCE OF PAVEMENTS ON PUBLIC HEALTH.*

By A. W. CAMPBELL, Ontario Road Inspector.
(Concluded).

In European practice, wood, more suited to a business street than macadam, affording a better foothold for horses than asphalt, less noisy than granite sets, is exceedingly popular, in spite of its less sanitary character. In this country, however, there is an unwillingness to renew a wooden pavement when decay has rendered it unfit for further use, and this, coupled with the less careful method of laying, is the cause of the complete disrepute into which it has fallen.

Experiments have been made recently by a Polish scientist with regard to cedar block. The bacteriological examinations showed that, in specimens taken from blocks which had been in use for four years, and from a depth of one centimeter and two centimeters below the surface, there were at the end of five days 650,000, 220,000 and 12,100 bacteria per gramme of wood. A later examination showed 1,200,000 colonies per gramme in the surface of the wood, and 8,699 colonies per gramme at two centimeters below the surface. An estimate, in terms of its nitrogen, was made of the organic matter absorbed by the wood, and indicated that the surface layer of wood contains more nitrogen than the most polluted soil. A comparative estimate of the pollution of the atmosphere was made by placing a definite quantity of sulphuric acid under a glass bell, on the surface of wooden and asphalt pavements, the result, as indicated by the quantity of ammonia absorbed by the acid, being much in favor of asphalt. The observations show that while a wooden pavement gives absolute protection to the soil and to the subsoil water, there was considerable atmospheric contamination. The experiments were made on blocks of pine, preserved by impregnation with copper sulphate. Such being the case with a wooden pavement laid under European practice, there can be little doubt of the unwholesome effect of cedar block upon the atmosphere. Further experiments of this description, conducted by members of your association, would doubtless prove instructive and profitable.

Broken stone or macadam would next arouse suspicion with regard to its absorbative qualities. There is this great difference between the two, however, that whereas a wooden pavement itself decays and affords food for the decay of other organic matter falling on it, the macadam does not in itself decay. With under-drainage, such as every well-built macadam possesses, it should be little more than a

good sewage disposal bed for the comparatively small amount of sewage which falls upon it. A macadam pavement can be scraped and swept, it is not noisy, dust can be subdued by sprinkling, and on sanitary grounds appears to be an excellent pavement for residential streets where traffic is not excessive. For business streets, or for heavily travelled thoroughfares of cities, a harder surface is advisable. With regard to absorption, there can be no objection to asphalt, vitrified bricks nor stone blocks. Asphalt is impervious to water, while the joints of brick or stone pavements are practically perfect so far as absorption is concerned.

To be sanitary, a pavement should not be dusty. The dust of a pavement is not only an irritant, but carries with it the bacteria of disease which, from various sources, are a part of street filth. To prevent dust, the pavement must be so perfectly cleaned that a practically harmless amount is taken up by the wind; or, if perfect cleanliness is not possible, dust must be subdued by sprinkling.

Unless perfectly cleaned—much more perfectly cleaned than is commonly the case in this country—an asphalt pavement is very apt to be a disagreeably dusty pavement on a windy day in summer. This, indeed, is one of its greatest faults from a sanitary standpoint. Toronto has the reputation of being a clean city, with a well-organized street department, yet even under these favorable conditions, a walk or drive down Yonge street on a warm, windy day is a very trying experience. The smooth, hot surface quickly dries any matter falling upon it, a wheel passing over this dry substance grinds it to powder, and the result is that clouds of dust find their way into the eyes, nose, mouth, throat and lungs of pedestrians. Business men in their offices are not safe from its attack, as it drifts in through the open windows. The dust imbeds itself in clothing, fastens itself on articles of food exposed in the shops, to be eaten finally by the purchaser. One case came to my notice in which a consumptive patient was ordered by his physician to leave Jarvis street, one of the best residential streets of Toronto, because of the dust which came from the asphalted roadway. These streets are swept by machines, and are hand-swept by a corps of city employees, but are not to my knowledge flushed as are similar pavements in London and Paris. Flushing is the only method whereby asphalt can be freed from this unsanitary dustiness, but in addition to being expensive and hurtful to the asphalt, such a proposal will doubtless meet the disapproval of the engineer in charge of sewers. The dust, however, is not a defect of the pavement so much as it is a fault in the method of cleaning.

Asphalt has, nevertheless, the disadvantage of being a very hot pavement. Its smooth surface, reflecting back the heat and light, is productive at times of sun stroke, and the glare is frequently painful to the eyes. This is most noticeable in

closely built business sections where there is least circulation of air, where the sun beats down between high brick walls; and is not so objectionable on a shady residential street with houses well apart.

Vitrified brick and stone block pavements are neither so dusty nor hot as asphalt, since the surfaces are less smooth and assist in retaining in the joints the finer particles of dust. Sprinkling, too, is in a great measure effective in subduing dust on brick or stone block than on asphalt, from the hot smooth surface of which moisture evaporates rapidly. A macadam pavement is dusty if not properly treated, but if scraped and swept as are other pavements, the dust can be largely subdued by sprinkling.

Noisiness, if excessive, is another unsanitary feature. A noisy pavement is jarring to the nerves, grating upon the sensibilities, and for either a heavily travelled business street, or a residential quarter, a quiet pavement is much to be desired. Noise itself is not always unhealthy. It is doubtful if the workman in a boiler factory, or a railroad engineer or other employee, is much influenced by the noise incidental to his occupation. Both are muscular of body, constantly taking vigorous exercise. But to the more sedentary man of business, whether at high nervous tension in his office or resting in the quiet of his home, a din, constant or intermittent, is a source of annoyance, and as such, is wearing on the nervous system. The most objectionable in this regard is granite or other stone block pavement. Vitrified brick is apt, unless great precautions are taken, to create a disagreeable rumbling. Asphalt, wood and macadam are the least objectionable with respect to noise.

While we have this to say of the comparative healthfulness of different varieties of pavements, there is another condition of matters common to too many towns and cities, in which the streets in fall and spring form a wilderness of mud and stagnant pools, and in summer are shapeless beds of dust. Many of them are made the receptacles of the refuse from private property which is left to disfigure the street, forming rivers of filth and cesspools of disease. Such streets have been regarded as a zero quantity, doing no particular harm, doing no particular good. Streets, however, which do no good, should do good, and therein lies the harm. A good street is a well-drained street, a well-cleaned street, and a source of healthfulness to the members of the community. Streets should be the public parks, pleasing to the cultivated taste, adding to the culture and refinement of the people, and enticing them out to breathe health and vigor, whether walking, bicycling, riding or driving. Passing along the city street we reach the country highway, which, as a means of permitting the people of the city to leave the congested portions and to reside in the less thickly populated suburbs, forms an important factor in securing public health.

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* Paper read at the recent meeting of the Association of Executive Health Officers of Ontario.