MUNICIPAL DEPARTMENT

VALUABLE REPORT ON ROAD CONSTRUCTION.

Mr. A. W. Campbell, Provincial Road Instructor for Ontario, at the request of the City Council of Woodstock, Ont., presented a report on the streets of that town, which contains much information of interest to municipalities who have the subject of road improvement under consideration. We print a large portion of the report herewith :

ROAD EXPENDITURE.

Money for this purpose is appropriated from the general funds of the town to the amount of about $2,000 annually. It is distributed among the various wards, and the sum given to each is under the control of the councillor representing that ward on the Board of Works. Under this system the effect invariable is to again subdivide the ward appropriation to such an extent that no work of a durable nature can be attempted. The people expect the amount to be scattered and the council has no course to pursue. The system is fundamentally bad. Money is not spent in accordance with the requirements of street improvement, and the result is waste, extravagance and bad roads. An annual appropriation from the general funds for the repair of roads is found to work satisfactorily and equitably. To construct roads, however, under this method is practically an impossibility, as the expenditure cannot be sufficiently concentrated.

FRONTAGE TAX.

The most suitable remedy for existing conditions in Woodstock is the frontage tax system. When work is undertaken under it, money is raised by the issue of debentures extending over a term of years. The amount is assessed against the property abutting on the work, or benefitted by it, according to the frontage of the lot, or according to its superficial area, or according to the assessed value of the property. Whichever one of these plans is chosen by the council must be stated in a general by-law submitted to the people for the adoption of the system. By means of the frontage tax system sufficient money can be raised to do durable, serviceable and economical work; and it is the most satisfactory method of consolidating road expenditure. Money thus raised is obtained at a very low rate of interest, and payment being extended over a term of years, the annual taxation is small. The ultimate cost is no greater than under the old system of patchwork, the difference being that less money is wasted. The durable improvements obtained are at once a benefit to the individual property owner, the value of property is increased, and the town as a whole becomes a more desirable place of residence.

Under this system work may be undertaken in three ways: (1) On the petition of at least two-thirds of the property owners affected, representing at least one-half of the value of the real property benefitted. (2) On the initiation of the council, unless petitioned against by a majority of the property owners affected, representing at least one-half of the property benefitted. (3) On the recommendation of the Board of Health for sanitary reasons. In assessing the cost, ratepayers are notified of the amount, etc., and courts of revision are held, giving an opportunity to appeal, and to adjust any errors in the assessment.

As has been intimated, a general by-law for the introduction of the system must be submitted to the citizens, and must be sanctioned by a majority vote. In framing this general by-law very great care must be taken to adjust it to local circumstances as far as possible. When this is done, and the by-law provides for a just and equitable assessment, street improvement is invariably stimulated. To this end peculiar cases, such as corner lots, triangular or irregularly shaped lots, side hills and similar property should be taken into consideration, also the matter of street intersections, which are sometimes paid for by the property owners on the street, and sometimes by the municipality. The frontage tax has in some cases unquestionably worked injustice, but when the by-law is judiciously framed there is no fairer way of paying for street improvement.

SUPERVISION OF STREET IMPROVEMENT.

In the direction and supervision of street improvement in Woodstock there are very serious defects. This branch of public work is in the hands of the ward representative on the Board of Works. There are five wards in Woodstock, and each member of the Board of Works is subjected to the possibility of a change annually. The result of such a system is that there is an entire lack of uniformity in street improvement. The work of one year is generally done without reference to the work of succeeding years, in view of which it may be rendered useless. Almost every street presents instances of this defect, in its sidewalks, its drainage, grades, and road metalling. For economical and satisfactory results, there should be someone with a knowledge of the principles of roadmaking and street improvement over this branch of public work, who would examine, stake out, and report to the Board of Works, with plans and specifications, and works of importance should be let by contract. All work should be completed under the supervision of this official. He should be in constant touch with the chairman and Board of Works, and should attend each of their meetings for consultation. Even if all who have ever been members of your Board of Works had been expert roadmakers, the constant change and interchange of plans would necessarily result in patchwork.

DRAINAGE.

Good pavements are largely a matter of good drainage. Not that the shape of the roadway, the material of which the surface is composed, or the way in which it is laid, are unimportant—but that these are very largely a part of the system of drainage. With the River Thames in the westerly portion of the town and Cedar Creek passing through the southern portion, with natural depressions or water courses leading to those streams throughout the town, admirable facilities for street drainage are afforded.

Underdrainage is one of the first points to consider. In making roads it is the native soil which must really support the weight of the traffic, no matter what paving material is used to surface it. Gravel, stone, brick or asphalt are not sufficiently strong to bridge over a wet and yielding sub-soil. But if this natural soil is kept in a dry state it can support any weight, and to this end underdrainage is necessary. Underdrainage of common field tile, four to six inches in diameter, should be placed on each side of the carriageway underneath the gutters, and below frost. This "lowers the waterline," and secures a good foundation.

There must be surface drainage, and for this the roadway should be crowned or rounded up, covered with suitable surface material, and open gutters provided to carry away this surface water. The surface metal (grave or other material) of course resists wear, but on streets which are lightly travelled the main object is to prevent the water penetrating the natural soil underneath, making it unfit to support traffic. By crowning the surface of the road, water is shed at once to the side, where provision should be made to carrry it away immediately in open gutters.

Gutters or underdrains are useless unless outlets are provided and care should be taken to see that these do not become obstructed. Surface drains may have outlets into the tile drains through catch-basins, or into the sewers where capacity for storm water is provided.

Springs underneath roadways should be tapped with blind drains and the water carried diagonally to the underdrains at the side of the road.

CROWNING THE ROADWAY.

To secure perfect drainage the roads should be uniformly crowned or rounded. On the streets of Woodstock very little attention appears to have been given to this important matter; as on the majority of streets no crown whatever is made, while in one or two instances, notably Vansittart ave., it is considerably above the adjoining property, driving the traffic to the gutters and making it almost dangerous to turn from the centre. On gravel or macadam streets this crown should be one inch of rise to each foot horizontal from the gutter to the centre; that is the centre of a roadway 24 feet wide should be 12 inches higher than the outer edge. It is well to first establish the grade of the sidewalk and then make the centre of the roadway conform to this as nearly as possible and with the same elevation. On hills the crown should be sharper, say ½ inch rise to one foot horizontal, so as to draw the water quickly to the gutters and prevent it following the wheel tracks and deepening them to ruts. Obtain the crown chiefly by rounding up the sub-grade or earth foundation, the remainder to be made up by the additional quantity of road metal placed in the centre of the roadway. Thus for a roadway 24 feet wide, the crown of the sub-grade should be nine inches, the remaining three inches to be secured by difference in thickness of gravel between the centre and the sides. Care should be taken to make the crown perfectly circular.

FORMING THE ROADBED.

The practice in your town has been to pile gravel in the centre of the roadway on the top of the natural soil, or to bring the earth from the gutter to the centre of the roadway, placing gravel on the top of this. This is the plan usually followed in grading township roads, but is totally unsuited for street construction.

The roadbed should be excavated to the required width to receive the gravel, broken stones or other road material and the excavated earth used in making boulevards or filling in the low lots to bring them to the grade of the street. The sides of the streets should be levelled to conform to the surface of the roadway. As far as practicably the crown of the finished street should not be higher than the adjoining property, but should conform to certain established grades.

(To be Continued.)