

## Editorial

### LAYING PAVEMENTS DOWN AND TEARING THEM UP AGAIN.

The detrimental effect upon pavements of being ripped up occasionally for the installation underground of water, sewer and surface drain laterals and connections, together with the unsightly patches by which the pavements are afterwards closed, have been the subject of considerable discussion among municipal officials and ratepayers. Many city councillors have waxed eloquent over it, and not a few poems have been invoked in the crusade against this procedure. Just how far the pursuit of economy warrants the laying of underground services before pavements are put down, is a problem with as many solutions as there are examples. Each case must be considered by itself.

In the campaign against the subsequent opening of street pavements there have been cities that have constructed laterals and connections that have little likelihood of being used for a number of years. In many cases, these have been subjected to danger from electrolytic action and there is little doubt that, after two or three years' disuse, considerable leakage will be developed in the water services, when put under pressure.

The city of Victoria has the matter under close consideration at the present time. Mr. C. H. Rust, city engineer, believes that the heavy cost of street paving works can be reduced by a modification of the practice in vogue of installing all underground services before the pavement is laid. Experience has shown that only a small percentage of the laterals installed in recent years are utilized, especially those opposite vacant property. In Victoria the increased cost of this work has not warranted the outlay, and Mr. Rust recommends that the laying of lateral services be omitted, except in downtown business districts. This does not apply to mains, of course, which should in any case be in before any pavements are laid.

Where the initial outlay for laterals proves a severe tax upon ratepayers and where many of these laterals may lie unused for years, the cost and annual interest thereon amount to a considerable sum. For example, in Victoria the cost of a heavy asphalt pavement, thirty feet in width, leaving out all laterals, and constructed in earth, is \$6.20 per front foot; in rock, \$8.90. The same pavement with lateral connections, in earth would cost \$8 per front foot, and in rock \$19.28. A light asphalt pavement, thirty feet in width, constructed in earth, without laterals, would cost \$5.29; in rock, \$7.10; while with laterals, the cost would be \$7.98 in earth and \$18.37 in rock. These figures include an allowance of 20 per cent. for interest, discount on debentures and contingencies.

While many cities have paid little attention to the placing of services prior to the paving of streets, and while many others at some time or other undertook to follow the plan and afterwards abandoned it, there should be some means of meeting the difficulty to the advantage of the city and the ratepayer as well. A patched pavement is a disagreeable sight, especially when the pavement is comparatively new. It bespeaks lack of forethought. Certainly there ought to be some plan whereby the property owners might be notified, when the new pavement is under contemplation, of the cost with and without the previous installation of services, and the oppor-

tunity given them, if they should desire, of having the lateral connections installed at their own expense before the service is put down. Ratepayers would undoubtedly see the economy in such an investment.

### METALLURGY IN GREAT BRITAIN.

The manufacture of materials used in the metallurgical industry in Great Britain has made gigantic strides since the outbreak of the war. The necessity for replacing by British-made goods the German and Austrian supplies was immediately in evidence at the outbreak of hostilities, and little time was lost in conducting the industry on a more extensive scale. Spelter is now being made by quite a number of manufacturers. Light steel castings, which previously came from Germany, are being manufactured in England to a much greater extent than ever before, and several new electric furnaces have been installed. Professor Turner, of the Birmingham Metallurgical Society, observes in a recent interview that the chief interest now centres in the less common metals and their alloys, some of which have been almost exclusively manufactured in Germany.

Pure malleable nickel is now being made successfully in Birmingham. Three city firms are interested in the matter, and two of them have already met with considerable success. Cobalt is also being made locally on a considerable scale.

Magnesium is now being made in England on a small scale, and more is required. Tungsten manufacture was established near London before the war, and ductile filaments of pure tungsten for electric lamps has been made in largely increasing quantities since the German supply has been cut off; in fact, all the tungsten that the country requires for the purpose of high efficiency electric lamps may now be made in England.

Tungsten alloys for use in steelmaking are being produced in Sheffield; while pure molybdenum is made near London, and ferro-molybdenum, for steelmaking, in three other localities. The British Empire produces supplies of ores of both tungsten and molybdenum.

Ferro-chrome is of great importance in the manufacture of armour-piercing projectiles, and this alloy is now being made in Birmingham. Ferro-silicon and ferro-titanium are also being produced.

The thermit process is being used in the reduction of pure metals and in the working of copper and various alloys. Plated metals, made by rolling copper, etc., on iron or steel, were formerly almost exclusively obtained from Germany and Austria, but a decided advance in this direction has been recorded in England. The same applies to refractory materials of special quality and for particular purposes, which are now being manufactured chiefly in London and Sheffield and have almost fully replaced foreign supplies.

Referring again to Prof. Turner's remarks on the new chapter which has been started in British metallurgical work, it is stated that many of the English productions now replacing those previously supplied by Germany are quite as satisfactory and even cheaper—in some cases much cheaper—than similar supplies imported before the war.