

## MUNICIPAL DEPARTMENT

### PORTLAND CEMENT STREET PAVEMENTS.

No substantial reason exists against the use of Portland cement pavement for streets and roadways in the United States, says Cement and Engineering News.

The points raised against its use disappear on close examination. While it is true that Portland cement concrete pavements do not possess every point of superiority over every other kind of paving material, compared with asphalt it is not so elastic under the tread of horse and wheel traffic, yet it is equally smooth and far more durable. Carefully conducted abrasion tests made on a stone rubbing bed at Philadelphia and described in this journal demonstrated that a Portland cement concrete block suffered less from abrasion than granite. We have therefore in a Portland cement street pavement the smoothness of asphalt with the wear resisting properties of granite. No other paving material can show like properties, therefore it should be used. The city of Philadelphia, we are pleased to note, is and has been for some time using Portland cement concrete pavements in all its alleys with entire satisfaction. It makes a perfect sanitary pavement. Berlin, Germany, has commenced laying it. The city of Grenoble, France, is likewise using Portland cement pavements on all streets in preference to all other paving materials on its intrinsic merits.

There are numerous streets in the city of Chicago originally paved with asphalt on concrete foundations from which the asphalt has entirely disappeared, leaving the concrete foundation exposed and in good state of preservation. One particular street in which the foundation is of Utica hydraulic cement concrete, denuded of its asphalt covering for more than eight years and over which much of the heavy structural iron was hauled for the Metropolitan Elevated Railway, shows little or no wear. Here and there slight depressions exist due to the introduction and repairs of the street, water and gas service, otherwise the street is in good condition.

The adoption of concrete street pavement is simply a matter of time and of educating the people to its use and economy.

Julius Cæsar built military roads of concrete in Europe which exist in part today under the traffic of two centuries.

Mr. Elias Boughner, of Wingham, Ont., has been appointed clerk of the county of Norfolk, to succeed the late Chas. Dickinson.

### A STREET TUNNEL IN MONTREAL.

In a recent paper read before the Canadian Society of Civil Engineers and recently reproduced in the Engineering News, Mr. Stuart Howard described the construction of the Ontario and Berri street subways, Brock street tunnel and Notre Dame street viaduct, in the city of Montreal.

The Brock St. tunnel is especially interesting in possessing the novel feature of a flood gate at the river end, intended to keep out the water and ice during freshets in the St. Lawrence river. This tunnel approach to the wharf level was built to overcome very steep gradients in the old surface approach, which seriously interfered with heavy hauling. It commences at Craig street, and with its approaches it has a total length of 905 ft., or 666½ ft. from portal to portal of tunnel proper.

The tunnel arch is a semi-circle of 15 ft. radius, springing from the floor of the tunnel, and thus gives a center headway of 15 ft. The portals are masonry, extending back 8 ft. and the arched stones are toothed so that the brick courses are tied to them. The intrados of the arch is fire brick, 9 in. thick, and the backing is hard red brick laid in cement mortar, 1 cement to 2 sand. On top of this brickwork is a 9 in. course of concrete, made of 1 cement, 2 sand and 4 stone; and over this concrete is placed No. 20 galvanized iron corrugated. The space between the tunnel and the tunnel-roof planking was carefully filled with stone laid by hand; this stone acts as a drain and any water

leaking in from above is carried through this stone to a 6 in. open jointed pipe, laid on a bed of concrete on the same grade as the tunnel. This grade is 1 in. 43 from portal to portal of tunnel.

### ALBANY EXPERIMENTS WITH GRAVEL.

An interesting experiment is in progress at Albany, N. Y., where vitrified brick pavements are being laid, in Swan St., on gravel instead of concrete foundations. The use of a substitute for concrete was apparently necessitated by the action of water, accumulated in the streets after rains, in undermining the roadways and causing expensive damage to the pavements. The brick, as laid on concrete foundations, formed a waterproof surface, and the water, running beneath, finding no outlet, hollowed wide holes in the underlying sand, and this resulted in a cave-in of the pavement above so soon as a heavy vehicle passed over the damaged part. The city engineer hopes to obviate this difficulty by the use of a gravel foundation, a foot thick, which is to be rolled until it has the hardness of a macadamized road, and can be guaranteed as indestructible. It is claimed that no matter how hard this foundation, water will percolate through it and soak naturally into the ground, and that, for this reason, gravel will be proved superior to concrete as a foundation for brick pavements.

Mr. A. K. Kirkpatrick has been appointed city engineer of Kingston, Ont., as successor to the late Mr. Bolger.

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