boards, plank, scantling, crossing timbers and cedar posts required by the corporation during the year 1894. Specifications may be seen at the office of the City Engineer.—It is said that Ald. Magill will erect a block of stores next year.

CHARLOTTETOWN, P. E. I.—J. W. Morrison, Secretary of Public Works, will receive tenders until Wednesday, January 17, 1894, for the repairing and extension of Murray River Wharf. Plans may be seen at the office of the Secretary and at the store of Mr. Cartney McClure, Murray River.—Tenders will also be received at Public Works Department until the 9th of January for building a new bridge across Martin's Creek, near Eldon.

MONCTON, N. B.—Mr. D. Pottinger, General Manager Intercolonial Railway, invites proposals until Thursday, the 28th inst., for the construction of a steel through bridge of five spans over the Narrows, Halifax Harbor, Nova Scotia, including piers and abutments containing about 6000 yards of ashlar masonry and 1000 yards of concrete. Plans may be seen at the Chief Engineer's office, Moncton, and at the office of the Station-Master, North street station, Halifax.

GALT, ONT.—Mr. F. W. Mellish, architect, is preparing plans for a two-story, nine room residence for Mr. J. McKenzie, to cost $2,000. The same architect is preparing plans for a store and office block for Mr. R. G. Struthers. The building will be three stories in height, the first story to be fitted for stores, and the second and third floors as offices. The materials used will be brown pressed brick and Portage Entry stone trimmings.—Mr. W. Hallman is building four dwelling houses for Dr. Lowry, at a cost of about $1,500 each from plans made by Mr. F. W. Mellish, architect.

OTTAWA, ONT.—The congregation of New Edinburgh Presbyterian church will meet shortly to consider the question of an enlargement of the Sunday school.—A meeting of the property owners of Gloucester township was held at Clarkston village last week to discuss the question of draining the large swamps in that neighborhood. The Government has offered to loan the necessary funds for twenty years to carry out the work. The matter will again be taken up at the next Township Council meeting.—A joint committee composed of members of Hull and Gatineau Point Councils recently waited on the Chief Engineer of the Public Works Department in regard to the erection of a bridge over Pond Creek. It was agreed that plans should be prepared at once for submission to the authorities.

LONDON, ONT.—Mr. J. F. Wood, of Ingersoll, proposes to erect a mammoth cold storage warehouse in this city, near the C. P. R. track.—The City Engineer has prepared the following estimate of the cost of carrying out the proposed improvements to the waterworks system, in accordance with Mr. Keefer's plans: steam pumping machinery, alterations and additions to pump house and connections, $25,000; hydraulic pumping machinery, alterations to house and connections, $30,000; additional springs, with connections, $15,000; purchase of Byron dam and improving power, $18,000; duplicate main of steel, 28-inch, $68,000; main extensions, $25,000: main extensions for London West, $15,000; house services for next five years, $15,000. The Council will apply to the Legislature for leave to borrow $125,000 of this amount, and the ratepayers will be asked to vote on a by-law in January sanctioning the expenditure of $58,000 for the new steel main.

MONTREAL, QUE.—Mr. Clement, of the firm of Clement & Pagnuelo, has written to the health Committee offering a piece of land situated between the two cemeteries as a site for the proposed contagious diseases hospital.—At the request of the Superintendent of waterworks, the Finance Committee of the City Council last week voted the sum of $22,000 to replace the old breast wheel at the pumping station. The sum of $16,000 was also granted for sundry improvements to the pumping station.—The special Committee appointed to report on the extension of the Dalhousie Square Station by the C. P. R. Company, has recommended to Council (1) that the City should expropriate the square, bounded by Craig, Berri, Notre Dame and Lacroix streets, to turn it over to the company for the erection of the depot; (2) to bridge Notre Dame street over the railway tracks; (3) to subscribe $150,000 towards the cost of the station, which should have a frontage of 300 feet on Craig street, be 66 feet deep, four stories high, and cost not less than $350,000; and that in turn the company will turn over to the city, Bellerive Park, the military stores property, the Macdonald property, and the lot on the corner of Berri and Francois streets, the company to construct and maintain an overhead passage from Notre Dame st. to the station on Craig st., for foot passengers.

TORONTO, ONT.—The City Engineer is preparing plans for the widening of the Queen street subway.—The City Council has given notice of its intention to construct a sewer on May street, between the north side of Hill street and its north end, at an estimated cost of $775.—A petition is being circulated among vessel owners and lake captains, for presentation to the Minister of Marine and Fisheries, requesting the erection of a lighthouse at Mississauga Point, at the mouth of the Niagara river.—Improvements are to be made to the building, No. 44 King St. East.—New plans for the improvement of the water front have been prepared, which locate the Ferry wharf first west of Yonge street, the Niagara boats wharf, between Yonge and Bay streets, and the Montreal and Hamilton boat wharves west of Lorne st. It is said that a local firm is ready to build a cold storage warehouse and fruit market on the block adjoining the Niagara wharf, provided they can start operations at an early date.—Building permits have been granted as follows: Guinane Bros., alterations and 2 story addition, 214 Yonge st., cost $12,500; Mrs. Gillespie, 193 Church st., three att. 3 story bk. dwellings, n. e. cor. Shuter and Dalhousie sts., cost $3,500.

FIRES.

Remillard's confectionery establishment at 110 McGill street, Montreal, was damaged by fire recently to the extent of $3,000.—The Riendeau hotel at Longueuil, Que., was burned to the ground on the 1st inst. The building belonged to Edmond Guenn, of Montreal, and was insured for $3,000.—J. W. Ross' general store at Sundridge, Ont., was burned last week. Loss, $2,500.—The old Colcutt brewery on University avenue, Cobourg, Ont., now used as bolting works by F. F Meehan, was destroyed by fire on Friday of last week. Mr. Meehan's plant was valued at $3,000.—Messrs. Stanley & Dight's storehouse at Lucan, Ont., was burned on the first inst., with all its contents. Loss, $10,000; partially covered by insurance.—The furniture factory of H. A. Wilder & Co., at 29 William street, Montreal, was damaged by fire to the extent of $25,000 recently.—Flesher's grist and saw mills at Flesherton, Ont., have been destroyed by fire.—The City Hotel at Jarvis, Ont., was burned to the ground recently.—The residence of Mr. James Murphy at Whitby, Ont., was destroyed by fire on Tuesday last. Loss. Loss, $2,500; no insurance.

CONTRACTS AWARDED.

TORONTO, ONT.—The Property Committee of the Public School Board have awarded contracts as follows for the completion of the Leslie street school: carpenter work, Kain & Wilson, $1,625; plastering, T. Gander, $351; plumbing, Keith & Fitzsimmons, $99; painting, J. A. Berridge, $184; heating, Smead, Dowd & Co.

MONTREAL, QUE.—The contract for the foundation for the new Worthington engine has been awarded by the Water Committee to Messrs. R. E. Edwards & Sons, at $1,185.50.—The Harbor Commissioners have awarded contracts as follows for the supply of timber and deals for 1894: W. H. Kelly, Montreal, round hemlock timber, pine deals and hemlock deals: Pemboroke Lumber Co., Pembroke, Ont., hemlock face timber; J. & W. D. Brown, Quebec, pine face timber; William Mason & Sons, Ottawa, flat pine timber; Robert McIntyre, Calumet, round pine timber; W. M. Platt, Brighton, Ont., coping pine timber.

BUSINESS NOTES.

J. H. Larkin, builder, Hamilton, has assigned to F. H. Lamb.

Wm. S. Dockrill, plumber, Montreal, has assigned with liabilities estimated at $3,000.

The partnership existing between Johcoeur and Apollinairs Gendreau, contractors, Montreal, has been dissolved.

Jos. Lebrun and Alfred Dumonier will carry on business in Montreal as contractors under the style of J. Lebrun & Co.

S. Swanton, contractor, 52 Victor ave., Toronto, has made an assignment to Geo. H. May. It is thought the assets and liabilities are about equal.

The *Legal and Commercial Exchange* report the following: S. Salloit & Co., contractors, Montreal, have dissolved.—Foisy & Leclair have formed a partnership as bricklayers and contractors in Montreal. — A partnership has been registered between Guisophe, Leonard & Co., builders, Montreal.—Wm. Loundes, builder, Halifax, N. S., has made an assignment.—Hall & Secord, builders, Brantford, Ont., has assigned to C. E. Oles.—Lessard & Lafleur will carry on business in Montreal as contractors.—Caron & Fils, contractors, Nicolet, Que., have assigned.

MOSAIC.

In order to reproduce a painting in mosaic the artists, or artisans, take a flat sheet of iron of the same size as the painting, surrounded by a border about an inch high. This receptacle is then filled with plaster, so as to obtain a perfectly flat surface. On this the outlines of the figures are drawn. The plaster is then cut up into small squares, which are removed and gradually replaced by as many squares of mosaic of the same size. In the holes left empty when the plaster is taken away, a new plaster made of travertine dust, lime and linseed oil is poured.

After three days this new plaster acquires the necessary consistency, and in this the artist sticks the little colored squares. When all the surface of the plaster is covered with these colored pieces of mosaic, the whole is washed with sand and water until it becomes quite smooth. The colored pieces are made of mixtures of different minerals, like arsenic, lead, glass, etc. These minerals are placed in an oven, and the different colors are obtained by the different degrees of heat, and as many as 28,000 various colors can be obtained.—*Harper's Weekly.*

As is well known, it is somewhat difficult to get vermillion surface to keep its brilliancy of colour. The following method gives good results: First give a priming coat of Venetian red, ground in oil; then apply a coat of vermillion and red lead, ground in oil and mixed with sufficient turpentine to produce a flat tint. On this apply an exactly similar coat, and finish by applying a free coat of good coach varnish.

There may be some of our readers who do not know the way in which zinc and lead may be used in interior painting. Of course, these pigments may never be mixed together for inside work, or even one coat applied on top of the other, because the result is sure to be a yellow appearance that will appear very soon after the painting is finished. If, however, a coat of alcoholic shellac is applied between the coats, lead and zinc may be used alternately without any disadvantage.

MUNICIPAL DEPARTMENT.

THE MANUFACTURE AND USE OF PAVING BRICK.

(Continued.)

There are two methods used for burning brick. The ordinary way in which common building brick are burned is in the updraft or clamp kiln. This furnishes good ordinary brick, but it is almost impossible to get a uniform product, not over 40 per cent. of the brick in a kiln being available for "pavers." The downdraft kiln secures a uniform and much higher temperature, a large percentage of the brick, from 80 to 90 per cent. in a well-designed and well-constructed kiln, being suitable for paving purposes.

In burning brick the fires must be started slowly in order to "water smoke" the brick without cracking them. In the brick as they come from the machine, there is from 20 to 30 per cent. of water. About 50 per cent. of this water is the water of the pores, and is removed at a temperature of 212 deg. Fahr. in the drying. The balance is lost at a temperature of about 1,400 deg. Fahr. in the burning. The loss of the physical and chemical water of the brick is accompanied by a corresponding loss in weight, and a considerable shrinkage in the dimensions of the brick, as may be seen from the following table:—

	On leaving machine.	On leaving dryer.	Brned, not vitrified	Vitrified.
Weight..	6.46 lbs.	5.79 lbs.	5.08 lbs.	5.08 lbs.
Length..	8¼ ins.	8 ins.	7 7-8 ins.	7¾ ins.
Breadth..	4 7-16 ins.	4 5-16 ins.	3 7-8 ins	3¾ ins.
Thickness	2½ ins.	2¼ ins.	2 1-8 ins.	2 ins.

Average of twelve samples.

Slow firing is continued until the smoke passing off shows no further signs of the water smoke (steam), after which the fires are gradually raised until the temperature throughout the kiln is sufficient to vitrify the brick, at which point it is held until they reach the proper point of vitrification, which is shown by the trial pieces or whole brick taken out through inspection holes in the top and sides of the kiln. After this the kiln is gradually cooled down and the brick removed. Too rapid cooling is detrimental, as the brick are rendered very brittle. By slow cooling the brick are annealed and rendered tough. The burning occupies from two to four days for water-smoking, from four to six days for burning proper and from three to five days for cooling.

In all lines of practical work experience with a given material is the only satisfactory method of determining the value of its various qualities. As in the case of cement, stone and wood, paving brick must be selected with due reference to the uses to which they are to be put: that is to say, to the nature and extent of the traffic they are to encounter and the character of the climate they are to withstand. A large percentage of clays are undoubtedly capable of producing brick suitable for country roads, light suburban travel and residence streets of towns or cities. From many can be made brick which will withstand the moderate traffic of the smaller cities of from 30,000 to 50,000 inhabitants. It is the writer's belief that clays can be found which, if properly manufactured and properly placed in the pavemedt, will outrival granite under the heaviest traffic, and some brick are now made which it is believed would prove economical under such traffic.

The colour in brick is no criterion of its value as a paving brick when comparing brick of various makes, but in inspecting brick from a single factory the colour will usually furnish a fairly safe guide as to the relative hardness, when the inspector is thoroughly acquainted with the particular manufacturer. Another criterion as to the character of any single make of brick is the comparative size. As the harder the brick is burned the smaller it becomes up to a certain limit, which must be determined for each make of brick; the unduly large brick may be unhesitatingly rejected as too soft. In general a brick for paving purposes must be homogeneous, free from uncrushed or lumpy material, especially if such material is not united by vitrification with the balance of the material of the brick. Vitrification is desirable, but not essential.

The disintegrating effects of frost are the most severe test a paving brick must stand, especially in streets of moderate traffic. Hence one of the first requisites of such a brick must be that it will not absorb a large percentage of water. The permissible ratio of absorption cannot be definitely fixed at any given percentage, for it is found that this ratio varies with different classes of brick. One class of brick, which seems to be uniformly made from clays which approach near to fireclays in character will admit 4 per cent. or 5 per cent. of water, and still not crumble through the action of frost, while others, if not burned hard enough to render them impervious to more than 2½ to 3 per cent., will be rapidly disintegrated by the frost. A core of lamination affords a seam where the frost may enter, and is inadmissible in paving brick. Fire cracks should be limited in number and extent. The presence of lime, in itself, is not detrimental in limited quantities, yet this must not exist as lime pebbles, or it will render the product entirely unfit for use by disintegrating and crumbling it.

The specific gravity of a brick is somewhat of an index of its comparative value, as the more material contained in it the greater the density and other things being equal, the greater its resistance to abrasion, crushing, &c. A certain