

the company's stock for the purpose of extending the supply pipes to Lake Erie, as the company claims there is danger of a water famine. The total cost would be \$100,000.

ST. THOMAS, ONT.—A movement is on foot to erect a building which shall afford accommodation for the Free Library, St. Thomas Art School and the Elgin Historical and Scientific Institute. The promoters of the scheme are hopeful that the proposed building will be erected in the near future.

PETERBORO', ONT.—The Peterboro' Water Company invite tenders until the 15th of May, for one set of waterworks pumps, of a capacity two and a quarter million gallons per twenty-four hours to be driven by water power. The same company also want tenders until the 1st of May for 300 tons of 16-inch cast iron water pipe.

BROCKVILLE, ONT.—Mr. Chipman, Town Engineer, has asked the council for permission to make the necessary surveys and call for tenders for the construction of sewers on the following streets: Daniel street from James to Brock; Brock street from Daniel to Perth; Perth street from Abbot to Perth, and Kincaid street from Jane to Gourlay, a total of about 2,300 feet.

TORONTO JUNCTION, ONT.—The tenders received for the erection of the new High School building have been found to be far beyond the sum at the disposal of the Board, the architect has been instructed to modify the plans and call for new tenders. At the last meeting of the Works Committee it was decided to recommend the paving of Dundas street, from Humberstone avenue to Victoria street, with cedar blocks and scoria block tooling.

MELITA, MAN.—Among other large buildings to be erected this season will be the grist mill, costing in the neighborhood of \$25,000. Mr. A. E. Thompson, talks of building a large block this year, as also does Asher Pierce. A number of persons contemplate erecting residences, among them being J. A. McInyre and A. M. Livingston.

LONDON, ONT.—Mr. White, Engineer of the Militia Department, Ottawa, was in the city yesterday, and went out to inspect the camp grounds on Carling farm. The location and character of the buildings to be erected, if this is to be made the permanent camp grounds were settled. The City Engineer has granted the following building permits: Captain A. W. Porte, addition to his Queen's avenue residence, cost \$1,300; Wm. McGarvey, addition to Queen's avenue residence, cost \$2,500—John Roddy, brick veneer residence, No. 178 John street, cost \$1,400; G. W. Armstrong, three brick cottages on Colborne street, near St. James, cost \$1,400 each.

HAMILTON, ONT.—Mr. W. A. Edwards, architect, has called for tenders for erecting a moulding shop for the Gurney-Tilden Co.—The O'Reilly property on Catharine street south has been definitely chosen by the Board of Education as the site for the new Collegiate Institute building.—The following permits have been granted: Frank Kidder, two-storey brick dwellings on Ferguson avenue, between Maria and Hannah streets, to John Moddie, alterations to 38 King street west, cost \$1000.—Henry Robson, two-storey brick dwelling on Oak avenue, between Cannon and Barton streets, cost \$1000.—At a meeting of the directors of the Watertown Electric Railway Company, held in this city a few days ago, the chairman, Sir W. P. Howland, of Toronto, was authorized to secure the services of an electrical expert to locate the power houses and prepare an estimate of the cost of the necessary plant.

OTTAWA, ONT.—An agreement has been arrived at between the Hull city Council and the Gatineau Point council regarding the construction of the proposed bridge across the Gatineau river. It will be situated opposite the property of Mr. Houviers, about 450 feet above the church. The plans will be sent to the Government for the approval of the Governor-in-Council, after which tenders for the work will be asked for.—Major-General Herbert leaves in a few days for England, one of his objects being to arrange with the Imperial authorities regarding the fortifications and military work to be constructed at the Esquimalt harbor in British Columbia, and for which the sum of \$155,000 was voted by Parliament at its last session.—Mr. H. Champagne, Chairman Waterworks Committee, will receive tenders until the 24th inst. for the supply of oils, lead pipe, brass work, hydrants, valves, castings, steel tanks and fire alarm supplies, etc., required by the department for the current year.—Mr. G. W. Bayly, architect, will receive tenders until Saturday next for the erection of a spire, etc., to a church in Manotick village.—The Ottawa Board of Health will at once proceed with the erection of a properly equipped isolation hospital, the funds to be raised by the issuing of debentures.—The City Council proposes to erect an incinerator for the burning of garbage.

WINNIPEG, MAN.—It is said that the Bell Telephone Company will shortly erect a new building in this city.—The water power committee of the city council will receive propositions up to noon of Saturday, June 3, for the construction of the works necessary to make available the water power of the Assiniboine river in the city of Winnipeg. Further information may be obtained

from Mr. L. A. Nares, Chairman Special Water Power Committee, to whom tenders are to be addressed.—Messrs. Croft & Cross have decided to turn the Davis block, corner of Princess and Market streets, into offices.—The City Clerk has been instructed to advertise for tenders for the construction of a sewer on River avenue, from Clark street to Henry street, tenders to be sent in before the 13th of May.—Mr. John Mathier was in the city recently making arrangements for the erection of the new building for the Bank of Ottawa. The plans are now being prepared, and building operations will be commenced in a short time.—Mr. Geo. Brown, architect, is preparing plans for a nine-room residence for Mr. Wm. Clark, of the Hudson Bay Co. It will be built of frame on stone foundation, and will be situated at the corner of Cooper and Colony streets. The cost will be about \$5,000.—Mr. Hugh Ross, contractor, has purchased seventy-five feet on Carlton street and will erect two residences thereon.—Arrangements are now being made by the Northern Pacific Railway Company for the construction of the Lake Dauphin railway. The road will start from Portage la Prairie, and tenders for the construction of the first 50 or 60 miles will be invited shortly.

MONTREAL, QUE.—Mr. Kennedy, Chief Engineer of the Harbor Commissioners, has presented the following estimate of the expenditure of his department for the present year: Harbor dredging fleet, \$110,000; harbor repairs, \$70,000; guard pier, labor and sundries, \$10,000; three new scows, \$7,500; new derricks, balance due to contractor, \$7,500; new pile driver, and fitting up, \$3,500; new latrines, 5 at \$400, \$2,000; harbor railway extension of tracks for Grand Trunk railway and Canadian Pacific railway to St. Lawrence sugar house, \$15,000; sundries and contingencies, \$10,000. The commissioners also require some two or three hundred tons of macadamizing stone.—The City Clerk will receive tenders until Tuesday, the 25th inst., for the erection of two police stations, one in St. Lawrence ward, under the supervision of Mr. Eric Mann, architect, 30 St. John street, and the other in Hochelaga ward, under the supervision of Messrs. Resther & Sons, architects, 107 St. James street.—The Road Department has given notice that sewers are to be constructed on Milton street, from St. Lawrence to St. Urban street, and on St. Charles Borromeus street, from Milton street northward.—The municipality of Pointe-aux-Trembles has granted the franchise for an electric railway and electric light system to the Corniveau Williams syndicate. The franchise is for thirty years.—J. Alcide Chausse, architect, is preparing plans for three stores and dwellings, with marble front for Mr. Joseph St. Martin, to be erected at the corner of St. Catherine and Parthenais street, cost \$20,000; two stores and dwellings on St. James street, for Philias Vanier, cost \$8,000; and extensive alterations and additions of two stores and six dwellings at the corner of St. Catherine and Maisonneuve street for Joseph Gareau, cost \$5,000.—J. B. Risther & Son, architects, have prepared plans for a large chapel for the Franciscan Fathers at No. 122 Dorchester street.

TORONTO, ONT.—The Property Committee of the City Council is advertising for tenders for a site on which to erect a central fire hall, to be situated between King, Yonge, Simcoe and Queen streets.—At a meeting of the Senate of the University of Toronto, held last week the report of the committee appointed to consider the accommodation for the department of geology and mineralogy was taken up. It recommends the erection of a new building, the three sites being: On the south side of Hoskin avenue, on the west side of the grounds opposite the residence, or the present residence. The report will be considered.—It is stated that Messrs. W. A. Murray & Co., the well known dry-goods merchants of King street, contemplate the erection of a large building suitable for their business, the present premises proving too small.—The special committee appointed by the Public Library Board to consider the question of electric lighting presented their report at a meeting held last week. It recommended that an electric plant be purchased, at a cost of \$1,828; also that the new reference library be lighted by electricity when completed.—Senator Sanford, of Hamilton applied to council for a renewal for 25 years of the lease of Oak Hall property on King street. He offered to build a building to cost about \$40,000 if his application was accepted. The matter was referred to a committee.—The Board of Works has adopted the recommendation of the City Engineer for the construction of a sewer on Elliott street, from Broadview avenue to Hamilton street and an asphalt pavement on Linden street, from Sherbourne to Huntley streets.—The City Clerk has received sufficiently signed petitions asking for the construction of cedar block pavements on Huron street, from Phoebe street to Grange avenue, and on Euclid place, from Euclid avenue to the east end.—Messrs. T. Eaton & Co. have purchased 62 feet of land on the south side of Albert street, and extending down to the company's store, and propose to immediately erect a large building thereon.—Building permits have been granted as follows: Authors & Cox, bk. store front and additions 135 Church st., cost \$2,000; Howarth Estate, alterations 247 Church st., cost \$1,000; John LeDrew, 21 Pacific ave., pr. s. d. 2 story and attic bk. dwellings, Grand ave. w. side South King st., cost \$6,000; German Lutheran church, bk. addition to church on Bond st., cost \$1,500; Chas. Somers, 124 Chest-

nut ave., 4 att. 2 story bk. dwellings, s. side Agnes st. w. of Chestnut ave., cost \$6,500. R. M. Scott, det. 2 story and attic bk. dwelling, 118 Lyndall ave., cost \$5,000; Geo. McKinnon, s. d. 2 story and attic bk. and stone dwelling, 39 Spadina Rd., cost \$3,000; R. C. Waterson, 161 Dunn ave., det. 2 story and attic bk. dwelling, 39 Dunn ave., cost \$3,000; Geo. Boxall, 73 Grenville st. pr. att. 2 story and attic bk. dwellings, 72 and 74 College st., cost \$5,000. Dr. Lorratt, W. Smith, eight att. 2 story bk. dwellings, 92 Scollard st., cost \$8,000.

FIRES.

Garland, Elliott & Co.'s clothing store at Port Arthur, Ont., was gutted by fire last week.—Mr. William Butchart's hardware store at Menford, Ont., has been destroyed by fire. The loss on the building is covered by insurance.—On Sunday morning last the Dominion Saw and Lead Works, situated on King street West, Toronto, and owned and operated by Messrs. James Robertson & Co., were badly damaged by fire, entailing a loss of about \$75,000. The lead department suffered the greatest loss, as much costly machinery was destroyed. The loss is covered by insurance.—A block of thirteen frame houses located at Montreal Annex, and owned by Mr. C. R. S. Dinick, Toronto, was destroyed by fire on Saturday morning last. The loss is placed at \$13,000, on which there is an insurance of \$7,800.—The old Christie foundry building on Baker street, Owen Sound, occupied by M. E. Bebee as a harness factory and waterroom, was damaged by fire recently to the extent of \$1,600.—The Presbyterian manse at Wardsville, Ont., together with the residence of Mr. E. C. Acheson, was burned on Sunday of last week.—The village of Granby, Que., was visited by a disastrous fire last week, commencing in the store kept by W. D. Bradford, and extending to the post-office block, belonging to J. L. Dozois. The great North-western Telegraph and the telephone exchange were also destroyed, also a dwelling house owned by Mrs. Bray. The loss is estimated at between \$40,000 and \$50,000.—The Glenroding saw mill, owned by Messrs. N. G. and J. McKechnie, and situated about five miles from Durham, Ont., was completely destroyed by fire on Saturday morning last. Loss, \$5,000, insurance \$1,300.

CONTRACTS AWARDED.

PARK HILL, ONT.—Contracts have been let for a new town hall, to cost \$5,000.

BELLELEVILLE, ONT.—The G. & J. Brown Mfg. Co. have been awarded the contract for an iron bridge at Delhi.

TORONTO, ONT.—The contract for extending the Brock street wharf has been awarded to Mr. Robert Grant. The contract price is \$4,375.

ST. THOMAS, ONT.—Mr. James Walthow, of this place, has been awarded the contract for frescoing the Grove Methodist church at London.

BROCKVILLE, ONT.—Messrs. Crain and Mix have been awarded the contract for rebuilding the residence on the corner of King and Park streets for Mr. Robert Bowie. Work will be started at once.

OTTAWA, ONT.—Messrs. Brudes & McNaughton, of this city, have been awarded the contract by the Dominion Government for the work to be done at Goderich harbor. The amount is in the neighborhood of \$38,000.

TORONTO JUNCTION, ONT.—The Board of Works has accepted the tender of the Hamilton and Toronto Sewer Pipe Company for the season's supply of sewer pipes, at the following prices: Eighteen inches, 50 cents; fifteen inch, 30 cents; twelve inch, 20 cents; nine inch, 11 cents.

LONDON, ONT.—Contracts have been awarded as follows for the erection of the new St. James' Episcopal Sunday School in South London. James Johnston, brickwork; Tambling & Jones, carpentering; H. & C. Colerick, painting; R. Gash plastering. The total cost will be about \$5,000.

MONTREAL, QUE.—W. Livermore, architect, has awarded the contracts for a convalescent home at Long Point for Mr. James Moore to cost \$37,000. The successful contractors are: Stone, Isaac Lewis; brickwork, Peter Wand; Carpentry, Geo. Roberts; roofing, Montreal Roofing Co.; plastering, Thos. Phillips; plumbing and heating, John Date; painting and glazing, A. Craig.

WINNIPEG, MAN.—Messrs. Rourke & Cass, contractors, have been awarded the contract for the new academy of music, to be erected here. The building will cost about \$40,000.—Mr. G. Brown, architect, has let the contract for the improvements to Mr. R. P. Roblin's house on Garry street. Mr. M. S. Burnham was the successful tenderer, the price being about \$5,000. A stone foundation will be placed in the building and several rooms added.—The School Board have accepted the tender of Kelly Bros. & Co. for the erection of the two new school buildings, at the price of \$19,608 for each building.

POLISH FOR IRONWORK.—Melt 2 lbs. of asphalt with 1 pint of boiled oil in an iron pot; remove it from the fire. Thin with spirit of turpentine.

TO BEND A GLASS TUBE.—Heat about two inches of the tube to an even temperature. Then bend quickly without pulling. This keeps the tube from flattening at the bend.

MUNICIPAL DEPARTMENT.

VITRIFIED BRICK, THEIR MANUFACTURE AND USE.

By W. S. WILLIAMS, CANTON, OHIO.

The clay should contain the proper amount of silica, aluminum and iron, with the necessary amount of alkalis to thoroughly flux it. The silica, aluminum and iron are practically non-volatile, and will receive a high degree of heat without injury.

The clay must be tempered or pugged not with so much water as to produce hydraulic resistance in compressing it, but with just a little water, just enough to induce a molecular change in the clay. It should be compressed to its utmost density, so as to assist nature as much as possible in forming a compact mass. In drying, the clay will creep together and shrink until the particles touch each other, and then stop.

The rest of the water must be taken off at a red heat, when more shrinking takes place. The brick at this stage is ready to become a semi-molten mass, and if properly treated when done the product should be a dense homogeneous mass from centre to exterior.

Vitrified so to speak throughout, not in structure or series of structures, but a dense compact mass, they should be so treated as not to become crystalline, or of a vitreous nature, but tough, or annealed as it were, so as to have the greatest cohesive strength possible. This gives us a material with greater strength than any known. In a crushing test as shown by our testing laboratories, the vitrified brick proves to be about one-third stronger than granite.

Troutwine, who is regarded as authority by all civil engineers, assumes the weight of ordinary brick work as one hundred and twelve pounds per cubic foot, and that it would crush under thirty tons per square foot; then a vertical column of it, six hundred feet in height, would crush at its base under its own weight, and average granite that weighs one hundred and sixty-five pounds per cubic foot, would sustain a vertical column of eight thousand one hundred and forty-five feet before crushing on its own base. Hence, as vitrified brick stand over one-third more under a crushing strain than granite, the brick vertical column will be over ten thousand feet in height before crushing at its base under its own weight. Troutwine gives the average crushing strength of granite as six hundred tons per square foot, and from the best information we can get, our testing laboratories give the average crushing strength of good vitrified brick as over nine hundred tons per square foot.

Vitrified brick are comparatively new to our architects, and their value are as yet almost unknown to them, but in the near future this brick must of necessity take a very important place with them when they once thoroughly understand that they take no dampness, and are stronger and more durable than granite.

In our larger cities where the air is tunneled with fifteen and twenty story buildings, the width and strength of walls is a very important matter. Space can be economized in thickness of the walls by reason of great strength of the brick. In case it is necessary, they may be buttressed either exterior or interior or both, and thus more room secured in the structure.

In vitrified brick building, there should be a brick used in the interior of the building made of the proper proportions of clay and saw dust or its equivalent. This brick should be burned until it is thoroughly vitrified, the saw dust being consumed in burning, the brick left honey-combed, or full of air cells as it were. This brick should be carried up with the masonry as an inside lining of the walls in the interior of the structure, no firing, no lathe required, plastering can be applied directly on the walls. The cellar should be paved with vitrified brick, and no brick allowed in the entire structure that is not vitrified. This would give us a structure, the walls of which would have great strength, fire proof, practically a non-conductor of heat and cold by reason of the air cells in the inside course of brick walls, perfectly dry, as they would not absorb a particle of moisture from turret to the bottom of the foundation, a fact which can not be said of any other known building materials, and with this end in view it is absolutely requisite that we make the very best vitrified brick, that quality instead of quantity should be the end to accomplish. The people of this country are now investing their money in permanent improvements and they demand the very best material that can be produced.

The paving of streets, and roadways, has for a long time been a source of much anxiety to the engineer. Granite is expensive, noisy and eventually slippery and becomes as rough as a cobble-stone pavement. Asphaltum costly, slippery, and does not wear well. Macadam grinds up and forms a paste, when wet, and is carried off by

Paper read at the Seventh Annual Convention of the National Brick Manufacturers' Association of the United States.