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CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL OF PUBLIC • WORKS • TENDERS • ADVANCE • INFORMATION • AND • MUNICIPAL • PROGRESS

EVERY THURSDAY

This paper reaches every week the Town and City Clerks, Town and City Engineers, County Clerks and County Engineers, Purchasers of Municipal Debentures and leading Contractors in all lines throughout Canada.

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CONTRACTS OPEN.

ELGIN, ONT. — A Roman Catholic church will be built here.

MARMORE, ONT.—Capt. O'Neil will build a new block of stores.

MEDONTE, ONT.—Andrew Walker is excavating for a brick house.

RAPID CITY, MAN.—The woollen mill recently burned will be rebuilt.

WHEATLEY, ONT.—J. D. Greaves is preparing to build another house.

THESSALON, ONT.—Debentures will be issued to erect a fire and town hall.

KASLO, B. C.—The Catholics have decided to build a church, 30 x 40 feet.

DESERONTO, ONT.- A Roman Catholic church to cost $8,000 will be erected here.

GODERICH, ONT.—The Bank of Commerce will erect a new building in this town.

PRESCOTT, ONT.—The sum of $6,000 will be expended in repairs to the public school.

NORTH BAY, ONT.—Mr. Jackson, of Bracebridge, will build a sash and door factory here.

WAWANESA, MAN - F. A. Tamblyn, whose hotel was recently destroyed by fire, will rebuild.

SMITH'S FALLS, ONT.—Extensive improvements will be made to the opera house this summer.

KINGSVILLE, ONT.—Mr. Jasperson will rebuild his flour mill. A site has not yet been decided upon.

ST. JOHN, N. B.—St. Luke's parish have decided to build a parish on the lot of land next the church.

HALIFAX, N. S.—The site is being prepared for a new residence for Hon. David McKeen, to cost $25,000.

STURGEON FALLS, ONT.—The Sturgeon Falls Pulp Co. will expend $75,000 on new buildings this season.

UPPER KENNETCOOK, N. S.—Nelson Weir, municipal clerk, will receive tenders until the 27th inst. for a loan of $1,500.

INGERSOLL, ONT.—W. G. Francis, clerk, will receive proposals until the 22nd inst. for repairing the White drain and branch.

NEW GLASGOW, N. S.—The Aberdeen School Board will receive tenders until the 22nd inst. for the erection and finish-

ing of the buildings of the Aberdeen hospital, according to plans to be seen at the office of Wm. McIntosh & Co.

TRURO, N. S.—The Truro News says that a scheme is being mooted at Milford to erect a building for the purpose of canning eels.

ST. CATHARINES, ONT.—The Whitman Barnes Mfg. Co. are calling for tenders for the erection of a building. Tenders close June 20th.

ORILLIA, ONT.—W. H. Croker, architect, has prepared plans for a new town hall, 36×66 ft., tower eighty feet high, and roof of slate.

BARRIE, ONT.—Kennedy, McVittie & Co. will receive tenders until the 24th inst. for erecting a frame building, 80×205 ft., to be used as a rink.

PETROLEA, ONT.—J. A. Jackson will receive tenders until the 24th inst. for the erection of a Presbyterian church. Plans at Mr. Jackson's office.

TILBURY, ONT.—J. L. Wilson, architect, of Chatham, has prepared a preliminary sketch for a new block, corner Yonge and Queen streets.

WELLAND, ONT.—Some residents of Division street propose laying a granolithic sidewalk in front of their residences. Among them is the Hon. Richard Harcourt.

FORT WILLIAM, ONT.—Mr. Jackson intends building a residence on May street. R. F. Waddington will also, we understand, build shortly on the same street.

SEAFORTH, ONT.—Mayor Holmes and Dr. Gunn, of Clinton, waited on the Town Council in reference to the election of a general hospital. The matter was referred to a special committee.

CHATHAM, ONT.—A by-law has been passed to authorize the issue of $30,000 debentures for waterworks purposes.—The City & Suburban Electric Railway Company also desire a contract for street lighting.

INVERNESS, QUE.—Tenders will be received by S. Turcotte, up to the 29th inst. for the repairs of the church and sacristy of St. Athanasius of Inverness, County Megantic. Plans and specifications at the presbytery.

GRIMSBY, ONT.—The council has instructed M. W. Hopkins, C. E., of Hamilton, to report on a system of waterworks for Grimsby, and to advise on the source of water supply. When the engineer's report is submitted it will likely be decided to submit a by-law.

VICTORIA, B. C.—The Bank of Montreal have purchased an additional 14 feet of the adjoining property from the trustees of Hon. Amor de Cosmos, and the plans for their new building will be altered immediately. The completed building will have an area of 2,860 square feet.

AMHERST, N S.—H. G. C. Ketchum, C. E., of Ship Railway fame, has arrived in Amherst with instructions to proceed at once with the work. An order in Council has been granted extending the time for three years from the first of October next for the completion of the work.

PORTAGE LA PRAIRIE, MAN.—Mr. Silverthorne, architect, is preparing plans for the reconstruction of a block, corner Main street, for A. Laurens. He is also preparing plans for improvements to John McLeod's block.—W. A. Crisp is preparing to erect a residence corner Tupper street and Lorne avenue.

VALLEYFIELD, QUE. — The Cotton Company has commenced excavations for a large flume, which is to be put in at the end of the mill near the site of the Parkham residence. It is intended to develop about eight hundred horse power. Work has also been started on a new warehouse for the company. The ground plan measures 170×90 feet, and it is to be three stories high.

PENETANG, ONT.—Kennedy, McVittie & Co., architects, of Barrie, are preparing plans for a brick and stone residence for Mrs. Geo. Copeland, with hardwood finish, hot water heating and all modern improvements. Tenders will be asked for shortly. The same architects are preparing plans for alterations and additions to the public school here.

PARRSBORO', N. S.—A resolution has been passed by the ratepayers authorizing the town council to apply at the next session of the Legislature of Nova Scotia *for an act to provide the town of Parrsboro* with a sufficient water supply, and for power to borrow $40,000 for the purchase of debentures issued in sums of not less than one hundred dollars, or a multiple thereof, redeemable in thirty years, and bearing interest at 4 per cent. per annum, payable half yearly.

NEW WESTMINSTER, B. C.—C. H. Wilkinson has submitted a new scheme for the construction of the Fraser river bridge here. The matter has been laid before the council.—J. J. Nickson has proposed to the City Council to connect with the city water main near Sapperton by steel pipes, carrying the piping along Front street, and across the north arm of the Fraser river, by means of a submerged main, thence on to Lulu island and down the island to Steveston, with branch lines for Richmond municipality.

OTTAWA, ONT.—A. M. Calderon, architect, is taking tenders for a residence to cost $5,000. He is also preparing plans for alterations to Rideau rink, a $5,000 residence, and a Turkish bath building, to cost $6,000.—Petitions have been presented to Council asking for the construction of a number of granolithic walks.—A scheme is on foot to supply Ottawa East with waterworks. The Ottawa Land Company intend making a proposition to supply water from the Little Chaudiere. Two and a half miles of pipe would require to be laid.

QUEBEC, QUE.—M. T. Raymond, architect, is preparing plans for St. Fregoire church at Sault Montmorenci. The building will be of stone, Roman style. Dimensions 192×66 feet. Tenders will be invited in July. The same architect has also prepared plans for a residence to be erected, corner of Prince Arthur and Dorchester streets, for M. A. Morcebs. — David Ouellet, architect, has prepared plans for a wood presbytery to be erected for the new parish of St. de Bienville Antoine.—A. Pion & Co. will build a wing to their establishment, 114×40 feet.—The Mother House of the Franciscan Nuns in France has approved of the new plans of the church of the Holy Sacrament on Grande Allée, and will, it is thought, contribute towards its construction.

HAMILTON, ONT.—*A scheme is on foot* for building a first-class summer hotel at the Beach, but the names of the promoters have not been made public. It is said the Hamilton Radial Electric Railway Company is interested in the project, and the cost is estimated at $100,000.—The Coleman Lumber Company has taken out a permit for a two-storey brick dwelling on Ontario avenue, for George McKnight, to cost $1,200.—The T. H. & B. Railway Company is negotiating for the disposal of bonds to raise money to build the spur line to connect the T. H. and B. with the Toronto branch of the G. T. R.—E. B. Jones, of Montreal, representing the Dominion Cold Storage Co., had a conference with Mayor Tuckett, C. R. Smith and Chairman Colquhoun, regarding the establishment in this city of a warehouse to cost $2,000,000.

LONDON, ONT.—The work of surveying the river, with a view to the establishment of a city sewage farm near Woodland cemetery, has been about half completed.—John McDonald will erect a double brick residence on Wolfe street.—McBride & Farncombe, architects, are taking tenders for an addition and alterations to the Weston Wire and Nail Works, addition to house on Dufferin avenue, addition and alteration to a house on Queen's avenue, brick residence on Waterloo street, and stable on Maitland street.—Herbert Matthews, architect, is receiving tenders for an addition to St. George's school on Waterloo street, and an addition to Lorne avenue school.—Mr. J. Watson, of St. Thomas, will erect two brick stores and residences combined at the corner of Hamilton road and Adelaide street, to cost $2,000.

MONTREAL, QUE.—Several residences will be erected this summer at Point a Pic, Quebec, among which will be Mr. Lavery, one villa, M. H. Warren, one store, Melle Connolly, one cottage.—Building permits have been granted as follows: Five houses, 50×119 ft., on Bourgeois street, for John Morison; one school, 35×45 ft., 4 stories, brick, Desery street, for School Commissioners · masonry and brick work, Z. Benoit; carpenter and joiner's work, A, Teliault. Two houses and one store, stone and brick, on St. Marie street, for N. Duford. Estimated cost $5,000. Carpenter and joiner's work awarded to O. Despatie.—The directors of the Hospital for the Insane, Verdun, have sold $35,000 worth of 4 per cent. bonds. The money is to be used in the erection of an extension to the male wing and general improvements.—The necessity of enlarging the main sewer on St. James street is becoming apparent.

WINNIPEG, MAN. —The Board of Works has recommended the construction of the following works: an asphalt pavement, 24 feet wide, on Donald street, from Assiniboine avenue to Portage avenue, cost $28,000; an asphalt pavement, 24 feet wide, on Assiniboine avenne, from Donald street to Kennedy street, cost $11,800; an asphalt pavement, 24 feet wide, on Kennedy street, from Assiniboine avenue to Broadway, cost $10,500; an asphalt pavement on Hargrave street, 24 feet wide, from Assiniboine avenue to Portage avenue, cost $30,000.—W. Blackwood will build an $8,000 residence on Colony street this summer. It will be built of local brick and native stone.—The new block, corner Graham avenue and Main street, for John Dyke, of England, will be four stories, brick and stone, 25×150 feet. The foundation is to be of stone with brick superstructure, relieved by stone dressings. Down stairs there will be three stores, one fronting on Main street and two small ones on Grahame. The upper part is to be arranged for offices and rooms.

TORONTO, ONT.—The Chairman of the Board of Control will receive proposals until the 15th of July for the privilege of constructing and maintaining a telephone service for the citizens of Toronto for a term of five years or longer.—The City Engineer has recommended the construction of a twenty-four foot asphalt roadway on Brunswick avenue, between College and Ulster streets, at a cost of $10,350.—The Board of Control has made a grant of $6,000 to the Industrial Exhibition Association, for the erection of machinery buildings.—Building permits have been granted as follows: Jas. McIntosh, 2½ storey bk. engine house, n. side Esplanade, near George street, cost $1,200; W. A. Hart, 1291 Queen west, 2 storey r. c. factory, n. side Pearson ave., w. of Sorauren, cost $1,200; A. Coulter, brick store and dwelling, cor. De Grassi and Gerrard streets, cost $1,400; L. J. Cosgrave, three-storey bk. hotel, southwest cor. of Queen street and Strachan ave., cost $7,000; J. T. Pears, cor. Pears ave. and Avenue road, bk. residence, cost $1,400; Provident Investment & Guarantee Co., 2 storey bk. stables, 570 Yonge

st., cost $1,700; Wm. Mullock, 2 storey bk. addition and alterations, 149 Yonge st., cost $7,000; Carroll Bros., pr. s. d 2 storey and attic bk. dwelling, 196 Berkeley st., cost $4,000; E. J. Davies, Copland Brewing Co., 2 storey and attic bk. dwelling, 194 Berkeley st., cost $2,000; Jas. Mason, 2 storey and attic bk. dwelling, 35 Queen's Park, cost $8,000.

FIRES.

A summer hotel at Sturgeon Point, Ont., owned by Wm. Simpson, has been burned. Loss heavy, with small insurance.—Johnson's roller mills at Dresden, Ont., were burned recently.—McKendry & Co.'s dry goods establishment at Toronto, was gutted by fire last week. Loss $200,000.—The Presbyterian church at Millbrook, Ont., was burned on the 4th inst. Insured for $2,500.

CONTRACTS AWARDED.

GRIMSBY, ONT.—Mrs. Makepeace has awarded the plumbing contract of her new residence to Frank Squibb, Hamilton.

PETROLEA, ONT.—O'Hara & Co., of Toronto, secured the $172,000 debentures for waterworks purposes, at a premium of 3%.

ST. CATHARINES, ONT.—Chatfield & Co. have been awarded the contract for the hot water heating of Mrs. Haynes' residence.

HAMILTON, ONT.—The Gurney-Tilden Co., Ltd., report a good demand for furnaces, radiators, etc., orders coming in from coast to coast.

TORONTO, ONT.—J. A. Berridge, painter, 518 Manning ave., has been awarded the contract for painting and glazing the High School at Port Hope.

WELLAND, ONT.—J. E. Cutler has been awarded the contract for the supplies for a residence at Fort Erie, and also for building a residence at Wamfleet for C. McCallum.

MILVERTON, ONT.—Thirteen tenders were received for the new school building. The contract has been awarded to Jacob Bundscho, Neuert Bros. receiving the sub-contract for mason work.

BRANTFORD, ONT.—The contract for all trades for a brick school building for Balfour street mission, West Brantford, has been awarded to Havill & Whiteham, of this city. Hewitt & MacLaren, architects.

ST. SCHOLASTIQUE, QUE.—Vincent & Dufresne, C. E., of Montreal, have been awarded the contract of straightening and deepening the Belle Riviere near St. Scholastique, in the county of Two Mountains. There will be 53,000 yards of dredging.

PORT HOPE, ONT.—The contracts have been awarded as follows, in connection with the new High School building: Mason and brick work, John McGill; carpentering and joinering, S. Coombs; slating and galvanized iron work, Jos. Brundrette; plumbing, Millward & Son.

HULL, QUE.—The Christian Brothers have given the contract for erecting a college building at Buckingham to contractor Fauteaux, of this city.—The council have accepted the offer of R. Wilson Smith, of Montreal, for the purchase of $65,000 of debentures, and of Mr. Bazin, of Ottawa, for $10,000.

ORILLIA, ONT.—Kennedy, McVittie & Co., architects, have awarded the contract for Rev. Father McPhillips' presbytery to J. R. Eaton, of this town. It will have all modern improvements, and will be of brick, with stone dressings. The same architects have started the work on Sanderson's residence on Cedar Island.

WINNIPEG, MAN.—The contract for completion of the Dufferin school has been awarded to Kelly Bros. & Co. at $1,640, and that for the Argyle school to T. M. Harrington, his tender being $1,825.—The Manitoba government opened 12 tenders for $100,000 worth of drainage debentures, bearing interest for 30 years at 4½ per cent. The tender of Geo. A. Stimson & Co., Toronto, was accepted. They offered $113,451.

KINGSTON, ONT.—Contracts for building a residence on University avenue for A. Malone have been awarded as follows: Mason work, W. Langdon; carpentering, J. Hooper; plumbing, heating and metal work, McKelvey & Birch; painting and glazing, Savage Bros.—The successful tenderers for alterations and improvements to Livingston Bros'. store are: Mason work, A. Newlands; carpenter's work, R. Gaw & Co.; metal work, Simmons Bros. & Pollie; plumbing and gas fitting, J. Jamieson. The architect is W. Newlands.

MONTREAL, QUE.—Mr. St. Jean, architect, has awarded a contract for important reparations to the church of St. Athanase, d'Iberville, to Poileau & Bros.—L. A. Montbriand, architect, has awarded contracts as follows. 2 houses on Bleury street for Mr. Levesque—Masonry, A. Dufort; carpenter and joiner's work, W. Gariepy; roofing, plumbing and heating, Lerperance & Therriault; brick, Olo. Deguise; plastering, H. Contant; painting and glazing, A. Delage; iron work, Dominion Bridge Co. Same architect has let the masonry contract for one house on St. Denis street for A. R. Archambault, to Latreille & Bros.

BUSINESS NOTES.

Landry Nelson, plumber, Ottawa, is dead.

W. B. Inwood, plumber, Toronto, has assigned.

The assignment is reported of George Beaucage, contractor, Quebec.

Hurtubise & Co., hardware merchants, Montreal, is in financial difficulties.

W. T. Stewart & Co., Toronto, have commenced business as felt and slate roofers.

Wilford Baril, paint merchant, Montreal, has made an assignment. Liabilities, $28,000.

A partnership has been formed between Thomas Armstrong and Edward Petit, plumbers, Montreal.

A. B. Dodswell, hardware merchant, Toronto, has placed his estate in the hands of an assignee.

Crevier & Hetu, plumbers, Montreal, have dissolved partnership. S. C. Crevier will continue the business.

George Howe, dealer in paints and oils, Ottawa, has assigned to P. Larmouth. Liabilities, $14,000; assets, $12,000.

The Attorney-General has taken proceedings at Montreal for $112,500 against Ald Prefontaine and Messrs. C. N. Armstrong and F. X. Choquette, trustees of the subsidy of $112,000 voted by the Quebec Legislature during the Mercier regime for the settlement of claims against the Montreal and Sorel Railway Company. It is claimed that the payments were irregularly made.

STANDARD SHAPES OF STRUCTURAL IRON.

Uniformity of rolled sections of iron and steel has long been a desideratum, says the Engineering Record, and considerable progress has been made towards securing it in Europe, where very convenient and rational systems of decimal increments and common sizes have been accepted by many of the leading mills, and great convenience and simplification of proportioning and ordering have resulted. The adoption of similar general regular sections has been urged in this country, and a pronounced beginning has been made by the Association of American Steel Manufacturers. On Jan. 17 last this association adopted certain rational sections of I beams, channels and angles as standard, and announced that the members of the Association will charge for any weight ordered which is not in the schedule, the price for the next higher weight there given; also that an extra charge of one-tenth of a cent per pound will be made on bills ordered to an accuracy greater than three-fourths of an inch of total length.

Steel sections only are enumerated, and the Carnegie Steel & Iron Company has just issued a list of sizes, tables and diagrams of the different shapes in which the weight is calculated at area × 3.4. All beam and channel flanges slope uniformly 16⅔ per cent. = 9 27′42″ = 1 in 6, and the radii of fillets and corners are simply functions of minimum web thicknesses. Diagrams give the scales of the minimum weights and corresponding three principal dimensions, and the usual moments, coefficients, etc., are given in accompanying tables. Twelve heights of beams, from 24 to 3 inches, 10 lengths of channels, from 15 to 3 inches, and corresponding cast separators, and 20 sizes of angles, from 6 × 6 inches to ¾ × ¾ inch,

are given. All of these have a section index and can be ordered by it from any mill in the Association, which will aim both to keep them in stock and to roll them specially more promptly than any special sizes.

HORSE HAULAGE.

At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on the 2nd inst, Mr. S. Herbert Cox, president, in the chair, a paper was read by Mr. T. H. Brigg, on "The Mechanics of Horse Haulage," a subject which has importance for contractors.

The author pointed out that it was well known, first, that it is easier for a horse to draw a two-wheeled cart up a hill if the load be put forward; and, secondly, that on the level or going downhill the load should be placed at the back. The principle involved in the first case is, that a horse can pull and exercise his force better when the weight is applied so as to hold him more firmly to the ground; whilst in the second case, when a horse does not require to exert much force to keep the load in motion, he should be relieved of all the burden possible, and even himself be partially carried, in order to save his legs both from physical exertion and percussion, thus enabling him to travel further and easier. This moving of the load to and fro has been practised with two wheelers of every description ever since the time when Roman charioteers stood backward or forward in their chariots as they travelled up and down hill. Exactly the same principles, only to a greater extent, apply to horses drawing four-wheeled waggons, &c., with their heavier loads, though perhaps the application of the principles is not so obvious to the ordinary observer as in the case of two-wheeled vehicles. The author explained that his system of attaching draught animals to vehicles is one which automatically confers those mechanical conditions which enable them to do the most work at the least cost. In a perfectly simple manner the shafts of both two and four-wheeled vehicles are made to constitute the necessary mechanical levers, which are so actuated by the horse's own pull, and by an automatic upward lift, that at one time the horse makes himself equal to a much bigger and heavier horse, therefore can pull a a bigger load, whilst at other times he is equal to a strong but lighter horse, thus able to move along with ease and comfort. The acting and co-acting forces are effective in causing the wheels at certain convenient times to ease the horse by carrying a part of his weight, whereas at other times when climbing hills and starting loads, &c., the horse is enabled automatically to transfer such a proportion of the load to his own body as the condition of the road may require. In this way his feet not only obtain a better grip upon the ground, but his body gains a two-fold mechanical advantage over his load. With the new system there is no possibility of the horse having to carry a load downhill or on level ground, as with the old system. The horse will maintain a good and sprightly action over a greater period of time, because the attachment avoids needless hammering of his legs and feet, thus causing him less pain, less exhaustion, and giving the animal greater speed and power of endurance. By the Brigg attachment the author showed that the horse's useful life is in many cases more than doubled, for he is not hampered on good roads by having to carry any portion of the load or vehicle, but the reverse; thus his energy, his legs and his feet are effectively and profitably preserved, and the author claims that it practically gives a new life to old horses.

The municipal corporation of the county of Essex have made application to the Ontario Crown Lands Department for patents of two town lots on Bedford and Peter streets, in the town of Sandwich, on which are erected the county gaol, court house and registry office. The buildings have been for many years standing where they are, and their total value is $65,000 or $70,000. Only recently they discovered that the site belonged to the Ontario Government.

Electric cranes, operated by the circuits supplying power and light, are used at the Sandycroft foundry in England. A novel feature is the addition of electro-magnets to such cranes for readily lifting pieces of iron and steel, one magnet, excited by 5½ amperes at 110 volts, being capable of supporting any weight up to two tons. So great a labor saver is this magnetic crane, it is stated, that three men now do in 15 minutes work that which formerly kept six men busy for an hour and a half.

Perhaps the most remarkable feat of building moving was that successfully accomplished in Chicago recently when a large stone church, with a massive square tower, was jacked up from its foundations and moved a distance of fifty feet to another lot. The church was moved in order to admit light into the rooms of a big hotel on Michigan avenue, at the corner of Twenty-third street. The hotel directly adjoined the Immanuel Baptist church, and new owners of the hotel figured that the rooms next the church would be worth vastly more if they had more light. They paid for the entire cost of moving the church, bought new land for it to stand on, and also bought the lot from which it was moved. The moving was done with entire safety and success.

MUNICIPAL DEPARTMENT

PURIFICATION OF DRINKING WATER BY MEANS OF FILTRATION.

The importance of pure water in determining the health of a community has long been recognized and cannot be over-estimated.

At the present time it is impossible for many cities and large towns to obtain the required amount of water from a naturally pure source, and in the future, with the enormous increase in population and the number of manufacturing towns established along the banks of the small strems and rivers, this difficulty will be manifestly greater. Therefore the possibility of purifying, by artificial means, water which has been polluted by sewage and which contains both organic matter and bacteria, has become a question of great importance in many communities.

In considering any method for accomplishing this object, two things must be borne in mind, viz., its efficiency and its cost. The objections which have been urged against filtration are:

First, that while a filter might remove the coarse material in suspension, it would allow all the organic matter in solution and the bacteria to pass through unchanged.

Second, that even if a filter were efficient for a short time, it soon becomes clogged and saturated, and then the condition of water which passes through is worse than when it entered.

Third, that the cost and maintenance of a properly constructed filter is so great that it cannot be universally adopted as a means of purifying water.

The report of the Massachusetts State Board of Health for the year 1894 contains some very interesting and important facts upon all these points.

For the past seven years the board has maintained an experimental station at Lawrence for the sole and express purpose of testing the efficacy of the filtration of water to purify it and render it fit for household purposes. The water tested was that of the Merrimac river, which is lined from source to mouth with manufacturing towns and which may be taken as a fair sample of river water contaminated with a considerable amount of organic matter.

The filters were of all sizes and thicknesses, from those a few feet square and ten inches in depth to the large filter covering two and one-half acres, through which the water supplied to the city of Lawrence has been filtered since 1893.

Chemical and bacteriological examinations were made weekly, and sometimes daily, of the water of ingress and egress. Sand of different sizes was used, and the filters were run both intermittently and continuously. The results of this careful and painstaking investigation, extending over a number of years, and every source of error being eliminated, are both astonishing and gratifying.

From a bacteriological standpoint they prove that a properly constructed and properly managed filter will remove from 98 to 98.84 per cent. of the ordinary bacteria in water, and that if such bacteria as the bacillus prodigiosous, which is very similar to the typhoid bacillus, be added to the water in varying proportions, the filter will remove from 99 to 99.993 per cent. The organic matter in solution is greatly diminished and the water is chemically purified.

Moreover, the efficiency of the filter, instead of diminishing, increases with age and use, owing to the formation of a gelatinous coating about each grain of sand, which serves to entangle the bacteria in their progress.

The rate of filtration may reach five million gallons daily per acre of filter without impairing the efficiency. If the surface clogging is properly removed, there will be no appreciable difference in the quality of the filtered water during or after the process of removal.

Finally, the cost of construction and maintenance of such filters is not so great as was supposed, and is not to be compared with the benefits derived from their use. The one which has been in successful use in the city of Lawrence proves that the plan is practicable in supplying cities with potable water. It seems to us that the knowledge derived from these experiments should be spread abroad and the attention of municipal authorities called to them.—Medical Record.

SPECIFICATION FOR BRICK PAVING.

The specification for brick paving adopted by the city of Peoria, Ill., for the coming year's work, includes the following:—The foundation is to be 6 in. of concrete, composed of one part natural cement, 1½ parts sharp sand, and four parts broken stone concrete, covered with a 2in. cushion of sand. The size of the bricks is to be 2½ in. by 4 in. by 8 in., or 3 in. by 4 in. by 9 in., and they are required to withstand the following tests:—(1) A transverse tests flatwise, in which they shall show a nodulus of rupture of 2,200 lb. per square inch; (2) an absorption test, in which, after forty-eight hours' immersion, they shall show an absorption of not more than 2 per cent. of their own weight; (3) an abrasian test, in which twelve bricks are placed in a cylindrical rattler, 24 in. by 3 ft., with 300 lb. of smoothly-worn scrap iron, in pieces varying from ¼ lb. to 5 lb. weight, and revolved one hour at fifteen revolutions per minute, after which the loss by weight for the smaller brick is to be not more than 9 per cent., and of the larger brick not more than 7 per cent. The cement is to be tested for fineness, time of setting, soundness and tensile strength. In the pavement the bricks are to be set on edge in rows running transversely across the street, except at street intersections, where the rows shall make an angle of 45 deg. with the curb lines. After laying, the bricks are to be settled by a roller weighing not less than 250 lb. per lineal inch, or by tamping by a 60 lb. rammer on a 2 in. by 12 in. by 12 ft. plank. The joints are to be filled with sand.

NEW YORK'S GREAT SEWER.

In their report to the Bronx Valley sewer commission, of which Mayor Strong and other prominent New Yorkers are members, the engineers of the commission recommended that the location of the sewer southwardly through the valley follow closely the general line of the river through the low land to the northerly end of Bronx park, and should then take a general easterly course to the outlet at High Island. This great sewer will be one of the largest drainage channels in the world. The size of the sewer, based on a prospective population, is submitted as follows. Kensico to White Plains, pipe sewer two feet in diameter; White plains to Hartsdale, brick sewer equivalent to circular sewer, three feet in diameter; Hartsdale to Tuchahoe, three and a half feet in diameter; Tuchahoe to Woodlawn, four feet in diameter; Woodlawn to outlet, five feet in diameter. The length of the sewer from Kensico to outlet at High Island will be 21.7 miles.

The cost of the sewer from High Island to Kensico, inclusive of land damages and improvements on the river, is estimated by the engineers at $3,617,310.

ONTARIO GOOD ROADS ASSOCIATION.

The annual meeting of the Ontario Good Roads Association will be held at the grounds of the Industrial Exhibition, Toronto, on Tuesday, the eighth day of September.

Arrangements will be made for a special exhibit of modern roadmaking machinery, crushers, bridges, culvert pipe, etc., during the fair. For this purpose the exhibition authorities will set apart sufficient ground to enable exhibitors to show the working of their machines. A. W. Campbell, C. E., Provincial Instructor in Roadmaking, will assist in completing arrangements.

The Association desires and is justly entitled to the co-operation of all manufacturers and others interested.

ARPHALT BETON.

Another kind of asphalt beton has been introduced in Austria, under government direction, a principle recommendation being the quickness of hardening which characterizes it. It is described as an earthy brown powder, having a slight odor of tar, and consists mainly of sulphur and iron slag, analysis showing 33.53 per cent. of sulphur, 8.21 of tar, 27.82 of iron slag, and 0.43 water, the iron slag containing 43.01 per cent. of silica, 22.42 of ferrous oxide, 30.9 of alumina, and 4.16 of lime. The hardness is attributed chiefly to the formation of an iron sulphide, the tar acting as a reducing agent. The silica, clay, and lime, though possibly combining at a slower rate, are regarded simply as impurities.

MUNICIPAL ENGINEERS, CONTRACTORS AND MATERIALS

ENGINEERS

INDEX TO ADVERTISEMENTS

In the "Canadian Architect and Builder."

Prices of Building Materials.

CONDITION OF THE MARKET.

TORONTO: There is a fair demand for builders' supplies from country points, but of city trade nothing encouraging can be said. Heavy hardware is a little easier, and plumbers' supplies also show a slight improvement. Galvanized iron receives some call. On brass goods a material advance has taken place. The glass market is quiet, and dealers hold good stocks in hand. Paints and oils are weakening.

MONTREAL: A fairly active trade is reported in lead pipe and galvanized iron. In iron pipe the feature of the market is the irregularity in discounts. Plumbers' supplies are quiet. The arrivals of cement for last week were 3,500 barrels of English and 6,000 Belgian, as against 2,650 barrels of English for the previous week, making a total to date of 21,770 barrels English and 21,755 Belgian. The demand is principally for small lots. The arrivals of firebricks have been 50,000, as against 125,000 the previous week. Sales made at $16 to $22 per thousand.

LUMBER.

CAR OR CARGO LOTS.

	Toronto.		Montreal.	
	$	$	$	$
1¼ to 2 clear picks. Am ins	33 00@36 00		40 00@45 00	
¼ to 2 three uppers, Am ins.	37 00		40 00	45 00
1¼ to 2, pickings, Am ins	26 00		27 00	30 00
3 inch clear			40 00	45 00
1 x 10 and 12 dressing and better	20 00	22 00	18 00	20
1 x 10 and 12 mill run	16 00	17 00		19
1 x 10 and 12 dressing	20 00	22 00		18 00
1 x 10 and 12 common	13 00	14 00	8 00	10 00
Spruce culls	10 00	11 00	8 00	10 00
1 x 10 and 12 culls	9 00	10 00		9 00
1 inch clear and picks	28 00	3200	35 00	40 00
1 inch dressing and better	20 00	22 00	18 00	20 00
1 inch siding, mill run	14 00	15 00	12 00	16 00
1 inch siding, common	12 00	13 00	10 00	13 00
1 inch siding, ship culls	11 00	12 00	10 00	11 00
1 inch siding, *mill culls*	9 00	10 00	8 00	9 00
Cull scantling	8 00	9 00	8 00	9 00
1¼ and thicker cutting up plank	24 00	26 00	22 00	25 00
1 inch strips, 4 in to 8 in. mill run	14 00	15 00	14 00	15 00
Inch strips, common	11 00	12 00	10 00	12 00
1¼ inch flooring	16 00	17 00	12 00	15 00
1½ inch flooring	16 00	17 00	12 00	15 00
XXX shingles, sawn, per M 16 in	2 30	2 40	2 60	2 60
XX shingles, sawn	1 40	1 50	1 60	1 70
Lath	2 00			1 50

VAID QUOTATIONS.

Mill cull boards and scantling	10 00	10 00		12 00
Shipping cull boards, promiscuous widths	13 00			13 00
Shipping cull boards, stocks	16 00			16 00
Hemlock scantling and joist up to 16 ft	11 00	12 00		10 00
Hemlock scantling and joist up to 18 ft	12 00	13 00	12 00	13 00
Hemlock scantling and joist up to 20 ft	13 00	14 00	13 00	14 00
Cedar for block paving, per cord		5 00		5 00
Cedar for kerbing, 4 x 14, per M		14 00		14 00
Scantling and joist, up to 16 ft		14 00		14 00
" " 18 ft		15 00		16 00
" " 20 ft		16 00		16 00
Scantling and joist, up to 22 ft		17 00		17 00
" " 24 ft		19 00		19 00
" " 26 ft		20 00		21 00
" " 28 ft		22 00		23 00
" " 30 ft		24 00		25 00
" " 32 ft		27 00		27 00
" " 34		29 50		29 50
" " 36 ft		31 00		31 00
" " 38 ft		33 00		33 00
" " 44 ft		34 00		36 00
Cutting up planks, 1¼ and thicker, dry	25 00	28 00	25 00	30 00
	B. M.			
1½ in. flooring, dressed, F M	26 00	30 00	28 00	31 00
1½ inch flooring, rough, B M	18 00	22 00	18 00	22 00
1¼ " dressed, F M	25 00	28 00	27 00	30 00
1¼ " undressed, B M	18 00	19 00	18 00	19 00
1¼ " dressed	18 00	20 00	18 00	22 00
1¼ " undressed	12 00	15 00	12 00	15 00
Beaded sheeting, dressed	20 00	35 00	22 00	35 00
Clapboarding, dressed		12 00	8 00	12 00
XXX sawn shingles, per M 18 in	2 60	2 70		3 00
Sawn lath	2 50	2 60	2 50	2 60
Cedar		2 90		2 90
Red oak	30 00	40 00	30 00	40 00
White	37 00	45 00	35 00	55 00
Basswood, No. 1 and 2	28 00	30 00	18 00	20 00
Cherry, No. 1 and 2	70 00	90 00	70 00	80 00
White ash, No. 1 and 2	24 00	35 00	30 00	35 00
Black Ash, No. 1 and 2	20 00	30 00	18 00	30 00
Dressing stocks	16 00	22 00	16 00	22 00
Picks, American inspection		30 00		40 00
Three uppers, Am. inspection		50 00		50 00

	Toronto.		Montreal.	
BRICK—₰ M				
Common Walling		6 50		6 00
Good Facing		8 00		8 50
Sewer	8 50	8 00	8 50	9 00
Pressed Brick, Per M:				
Red, No. 1, f.o.b. Beamsville		16 00		
" " 2		14 00		
" " 3		9 00		
Buff		21 00		
Brown		24 00		
Roman Red		30 00		
" Buff		35 00		
" Brown		40 00		
Sewer		7 50		
Hard Building		6 00		
Roof Tiles		22 00		
Hip Tile (each)		20		
Ridge Tile "		60		
1st quality, f.o.b. at Port Credit		14 00		18 00
2nd " " " "		12 00		15 00
3rd " " " "		8 00		12 00
Hard building brick		6 50		
Ornamental, per 100	3 00	10 00		
SAND.				
Per Load of 1½ Cubic Yards		1 25		1 25
STONE.				
Common Rubble, per toise, delivered		14 00		14 00
Large flat Rubble, per toise, delivered		18 00		18 00
Foundation Blocks, per c. ft.		50		50
Kent Freestone Quarries Moncton, N. B., per cu ft., f.o.b.		1 00		
River John, N. S., brown Freestone, per cu. ft., f.o.b.		95		
Ballochmyle	80	90	65	75
New York Blue Stone				1 05
Granite (Stanstead) Ashlar, 6 in. to 12 in., rise 9 in., per ft.				25
Moat Freestone			60	70
Thomson's Gatelawbridge, cu. ft.			75	80
Credit Valley Rubble, per car of 15 tons, at quarry		8 00		
Credit Valley Brown Coursing, up to 10 inch, per sup. yard, at quarry		1 75		3 25
Credit Valley Brown Dimension, per cu. ft. at quarry		60		75
Credit Valley Grey Coursing, per superficial yard	1 50	2 00		2 15
Credit Valley Grey Dimension, per cubic foot		60		75
Clark's N. B. Brown Stone, per cubic foot, f.o.b.		1 15		1 00
Brown Free Stone, Woodpoint, Sackville, N.B., per cub. ft.		1 15		1 00
Madoc Rubble, delivered, per toise	14 00	14 50	14 00	14 50
Madoc dimension floating, f. o. b. Toronto, per cubic ft.	30	32		
Cape Bauld, N. B., Brown Freestone		90		70
Cocaigne, N. B., Gray Freestone (olive-green)		90		70
OHIO FREESTONE, FROM THE GRAFTON STONE CO.'S QUARRIES.				
No. 1 Buff Promiscuous		90		1 00
No. 1 Buff Dimension		95		1 05
No. 1 Blue Promiscuous		60		70
No. 1 Blue Dimension		65		75
Sawed Ashlar, No. 1 Buff, any thickness, per cub. ft.		1 10		1 20
Sawed Ashlar, No. 1 Blue, any thickness, per cub. ft.		80		90
Sawed Flagging, per sq. ft., for each inch in thickness		06½		07½
Above prices cover cost freight and duty paid. For small lots add 5 to 10 cents per cubic foot.				
Quebec and Vermont rough granite for building purposes, per c.ft. f.o.b. quarry	33	1 50		
For ornamental work, cu. ft.	35	2 0		
Granite paving blocks, 8 in. to 12 in. x 6 in. x 4½ in., per M		50 00		
Granite curbing stone, 6 in. x 20 in., per lineal foot		70		
SLATE.				
Roofing (₰ *square*).				
" red		18 00		20 00
" purple		00		10 00
" unfading green		9 00		6 00
" black		8 00		5 50
Terra Cotta Tile, per sq		25 00		
Ornamental Black Slate Roofing		8 50		

PAINTS. (In oil, ₰ lb.				
White lead, Can., per 100 lbs.	6 25	5 50	5 50	6 00
" zinc, Can., " "	6 50	7 50	6 50	7 50
Red lead, Eng	4 00	5 00	4 50	5 00
" venetian, per 100 lbs	1 60	1 75	1 60	1 75
" vermillion	90	1 00	90	1 00
" Indian, Eng	10	12	10	12
Yellow ochre	5	10	3	5
Yellow chrome	15	20	15	20
Green, chrome	7	12	7	12
" Paris	20	25	14	20
Black lamp	15	25	12	25
Blue, ultramarine	15	20	12	18
Oil, linseed, raw, ₰ *Imp. gal.*	54	59	58	59
" " boiled "	57	63	62	63
" " refined, "	78	85	75	75
Putty	2¾	2½	2¾	2½
Whiting, dry, per 100 lbs	75	1 00	60	75
Paris white, Eng., dry	90	1 25	90	1 00
Litharge, Eng	4	5	4 50	5 00
Sienna, burnt	10	15	12	15
Umber, "	8¼	12	12	15
CEMENT, LIME, etc.				
Portland Cements.—				
German, per bbl		3 25	2 55	2 65
London "	2 50	2 75	1 92	2 05
Portland Cements.—				
Newcastle "		2 50	1 85	1 95
Belgian, Jonson, artificial	3 40	2 50	2 65	2 75
English, artifical, per bbl	2 60	2 90	2 55	2 65
Belgian, natural, per bbl	2 30	2 40	1 70	1 85
Canadian "	2 30	2 50	1 80	1 85
Roman "			2 00	2 25
Parian "	4 50	4 75	5 50	5 75
Superfine "	6 50	7 00	8 00	9 00
Hydraulic Cements.—				
Thorold, per bbl		1 50	1 25	1 50
Queenston, "		1 50	1 50	1 60
Napanee, "		1 50		1 50
Hull, "		1 50		1 50
Ontario, "		1 25		
Keene's Coarse "Whites"	4 50	4 75	4 50	4 75
Fire Bricks, Newcastle, per M	27 00	35 00	15 00	21 00
" Scotch "	27 00	35 00	19 00	21 00
Lime, Per Barrel, Grey		40		
" " White		50		
Plaster, Calcined, N. B		2 00		
" " N. S		2 00		2 50
Hair, Plasterers', per bag	80	1 00		
HARDWARE.				
Cut nails, 5cd & 6cd, per keg		2 65		2 25
Steel " " "		2 75		2 50
CUT NAILS, FENCE AND CUT SPIKES.				
4od, hot cut, per 100 lbs		2 70		2 30
3cd, " " "		2 75		2 35
20d, 16d and 12c, hot cut, per 100 lbs		2 80		2 40
10d, hot cut, per 100 lbs		2 85		2 45
8d, 9d, " "		2 90		2 50
6d, 7d, " "		3 05		2 65
4d to 5d, " "		3 25		2 85
3d, " "		3 63		3 25
2d, " "		4 15		3 75
4d to 5d cold cut, not polished or blued, per 100 lbs		3 15		2 75
3d to 5d cold cut, not polished or blued, per 100 lbs		3 55		3 15
FINE BLUED NAILS.				
3d, per 100 lbs		4 00		3 75
2d, " "		4 50		4 15
CASING AND BOX, FLOORING, SHOOK AND TOBACCO BOX NAILS.				
12d to 30d, per 100 lbs		2 50		2 60
10d, " "		2 80		2 70
8d and 9d, " "		2 95		2 80
6d and 7d, " "		3 10		3 05
4d to 5d, " "		3 30		3 20
3d, " "		3 70		3 60
FINISHING NAILS.				
3 inch, per 100 lbs		3 10		2 95
2½ to 2¾ " " "		3 25		3 10
2 to 2¼ " " "		3 40		3 25
1½ to 1¾ " " "		3 60		3 45
1¼ " " "		4 00		3 85
1 " " "		4 50		4 35
SLATING NAILS.				
5d, per 100 lbs		3 35		2 95
4d, " "		3 35		2 95
3d, " "		3 75		3 35
2d, " "		4 25		3 85
COMMON BARREL NAILS.				
1 inch, per 100 lbs		3 75		3 35
⅞ " " "		4 25		3 60
¾ " " "		4 75		4 35
CLINCH NAILS.				
3 inch, per 100 lbs		3 35		2 95
2½ and 2¾ " "		3 50		3 10
2 and 2¼ " "		3 65		3 25
1½ and 1¾ " "		3 85		3 45
1¼ " "		4 50		4 10
1 " "		5 00		4 60
SHARP AND FLAT PRESSED NAILS.				
3 inch, per 100 lbs		3 75		3 45
2½ and 2¾ " "		4 00		3 60
2 and 2¼ " "		4 20		3 75
1½ and 1¾ " "		4 40		3 95
1¼ " "		5 00		4 60
1 " "		5 50		5 10
STEEL WIRE NAILS.				
Steel Wire Nails, 75 % discount from printed list				
Iron Pipe:				
Iron pipe, ¼ inch, per foot		6c.		6c.
" " ⅜ " "		7		7
" " ½ " "		8½		8½
" " ¾ " "		12		12
" " 1 " "		17		17
" " 1¼ " "		24		24
" " 1½ " "		30		30
" " 2 " "		43		43
Toronto, 65 per cent. discount.				
Montreal, 60 to 65 per cent. discount.				
Lead Pipe:				
Lead pipe, per lb		7c.		
Waste pipe, per lb		7½		
Discount, 30 % off in small lots.				
Galvanized Iron:				
Adam's—Mar's Best and Queen's Head:				
16 to 24 guage, per lb		4½c.		4¼c.
26 guage, "		4¾		5
28 " "		5		5¼
Gordon Crown—				
16 to 24 guage, per lb		4¼		4¾
26 guage, "		4½		4¾
28 " "		4¾		5
Note.—Cheaper grades about ¼ c. per lb. less.				
Structural Iron:				
Steel Beams, per 100 lbs		2 75		2 50
" channels, "		2 85		2 60
" angles, "		2 50		2 30
" tees, "		2 80		2 65
" plates, "		2 55		2 35
Sheared steel bridge plate				2 35

(Corrected up to June 17th)