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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.

Vol. 6.

MAY 30, 1895

No. 17.

THE CANADIAN CONTRACT RECORD.

PUBLISHED EVERY THURSDAY

As an Intermediate Edition of the "Canadian Architect and Builder."

Subscription price of "Canadian Architect and Builder" (including "Canadian Contract Record"), \$2 per annum, payable in advance.

C. H. MORTIMER, Publisher,

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New York Life Insurance Building, Montreal, Bell Telephone 2299.

Information solicited from any part of to Dominion regarding contracts open to

Advertising Rates on application.

TENDERS

Whole Tenders will be received by the undersigned until Saturday, the 8th of June, for the erection of a

SCHOOL ROOM ADDITION TO THE PRESBYTERIAN CHURCH AT WOODBRIDGE.

The lowest or any tender not necessarily accepted. Plans and specifications may be seen at my office, Woodbridge.

JOHN NATTRASS, Sec. Building Committee

TENDERS WANTED

Tenders will be received at the office of the undersigned until 5 p. m. FRIDAY, JUNE 6711, 1895, for a

BRICK CHURCH

for the ST. MATTHEW'S EPISCOPAL CONGREGATION, London, Ont.
The lowest or any tender will not necessarily be accepted. MOORE & HENRY, Architects, London, Ont.



TENDERS

FOR

STEAM ROAD ROLLER

Tenders will be received by registered post only, addressed to the City Engineer, Toronto, up to 11 o clock a.m. on SATURDAY, THE 1ST DAY OF JUNE, 1895, for a

12 TON STEAM ROAD ROLLER, WITH COMPOUND ENGINES.

Forms of tender may be obtained at the office of the City Engineer on and after Wednesday, the 15th of May next. A marked cheque, payable to the order of the City Treasurer, for the sum of 2½ per cent. on the amount of the contract price, must accompany each and every tender, otherwise it will be ruled out as informal.

informal.

Lowest or any tender not necessarily accepted.

DANIEL LAMB, Chairman Committee on Works.

Works Dept., City Hall, Toronto, May 10th, 1895.

TENDERS

Tenders will be received at the office of the Engineer of the London and Port Stanley Railway, London, Ontario, up to 6 o'clock on SATURDAY, 15711 JUNE,

TWO STEEL BRIDGES

over Kettle Creek and Mill Creek. Specifications and profiles may be had on application to the Engineer.

ORMSBY GRAYDON,
Resident Engineer, L. & P. S. R. London, Out.

TENDERS

Tenders will be received up to 6 o'clock on SATUR-DAY, 15TH JUNE, for the construction of

Two Scone Culverts and Embankments

on the London and Port Stanley Railway near St. Thomas. Specifications, profiles, &c., may be obtained from undersigned.

ORMSBY GRAYDON, Resident Engineer L. &. P. S. R.

London, May, 1895.

CONTRACTS OPEN.

TAMWORTH, ONT .- C. G. Coxall will build a brick store here.

CARBERRY, MAN. - J. P. Curran intends erecting a new residence.

BERLIN, ONT .- Geo. Schlee will build new residence this summer.

BRISTOL, ONT .- The Baptist congregation of this place propose electing a new church.

KENTVILLE, N. S.—Tenders are invited by F. H. Eaton, Town Clerk, until Saturday, the 15th of June for a loan of \$27,500.

SOUTH EDMONTON, MAN.-Tenders are being asked for excavating the founda-tion for Brackman & Ker's oatmeal mill to be built here.

SUSSEX, N. B.—The Sussex Record states that a company of capitalists are considering the question of putting in an electric light plant.

TILSONBURG, ONT.—The Tilsonburg Waterworks Company have been granted a franchise by the town for constructing a system of waterworks.

STRATFORD, ONT .--A special committee has recommended that the City Council take steps to establish a House of Refuge for the county.

HUNTINGDON, QUE.--The question of granting a franchise to a company to construct waterworks, sewerage and electric light systems is under consideration.

PORTAGE LA PRAIRIE, MAN.-The Council invites tenders until the 17th of June for the purchase of \$20,000 of debentures. Address David McCowan, Treasurer.

PORT ELGIN, ONT.—W. Burgess, Clerk, invites tenders on behalf of the municipal council for the erection of a windmill pump, with 60 feet steel tower, and capacity of 150 barrels per day.

HAMPTON, N. B.—The contract for the construction of the Central railway from Chipman to Newcastle will be let by tender as soon as the agreement has been signed by the Dominion Government. G. Evans will be engineer in charge.

MORDEN, MAN.—Plans for the new hotel to be erected by J. Heiman & Co. have been completed, and it is expected that the contract will be let in a few days. The hotel will be 80 feet by 50 feet, three stories high, of solid brick and stone.

HALIFAX, N. S.—The City Engineer has reported upon the cost of pavements as follows: Gottingen street, from Cogswell street to Gerrish street, asphalt, cost \$10,560; Pleasant street, from Morris to South street, asphalt, cost \$13,000; Cornwallis street, granite curbing, cost \$11,000.

BARRIE, ONT .- Mr. Jno. Dickenson, B. A., is about to erect a new country residence, to cost about \$5,000. Messrs. Smith & Bird, Barrie, are the architects.

—Capt. Bird and W. N. Myers, of Barrie, are making extensive alterations in their residences.-An agitation is on foot for a street railway system, and hopes are entertained of securing it.

ORILLIA. ONT.—Mr. W. H. Croker, architect, has prepared plans for Mr. Preston Hallan's residence. Estimated cost \$2,500. He is also preparing plans for the new Anglican church at Brace-bridge, estimated cost \$3,700.—A by-law will be submitted to the ratepayers to raise the sum of \$4,000 to furnish the new town hall.—Thos. McKee is about to commence the erection of a new residence on Neywash street.

ST. JOHN, N. B.—The Board of Works has recommended that the bridge over Newman's brook, be repaired at a cost of \$1,500. Plans will be submitted at the next meeting of the Board.—Tenders for the erection of a brick and stone church at North End will be received by H. H. Mott, architect, until Friday, the 7th of June.—R. G. Leckie is the chief promoter of the company which is considering the establishment of smelting works here.

NEW WESTMINSTER, B. C.-Two schemes have recently received considerable attention. One is to build a canal from Westminster by way of swampy lands, small lakes and valleys to False Creek, Vancouver. It is said the cost would be comparatively small, owing to the nature of the ground. The other is to build a tramway line from Westininster to Vancouver via Stevenson. The latter scheme is said to be backed by Montreal capitalists.

MIDLAND, ONT. -The Council have had plans prepared for a new fire hall and Council chamber. Estimated cost \$3.500.—Mr. Thos. Crompton proposes building a new residence, at a cost of \$2,500.—A deputation last week interviewed the Minister of Public Works at Ottawa, asking the Government to assist the town of Midland in constructing a dry dock here, 400 feet long, estimated to cost \$60,000. Consideration was promised by the Minister.

VICTORIA, B. C.—The Dominion esti-

mates contain the following appropriations for British Columbia: Victoria drill hall and accessory buildings, \$2,500; new post office at Victoria, \$40,000; Columbia river, improvements above Golden, \$2,500; dredging in Victoria inner harbor, \$5,000; protection works at Garry Bush, Fraser river, \$1,000; improvement of channel, Fraser river, \$10,000; general harbor, river and bridge improvements, \$3,000; improvements between Canal Flat and Fort Steele, East Kootenay, \$2,000; Skeena river, \$2,000.

LONDON, ONT. - Plans for the new church to be erected this summer for the congregation of St. Matthew's, East London, have been completed by Messrs. Moore & Henry, architects, and tenders will be called for in a few days. The building will cost about \$6,000.—A. G. McPherson will erect a residence on Princess avenue, to cost \$2,500.—W. D. Buckle will build a brick house on Central avenue, near Waterloo street.-Upon the recommendation of Mr. Keating, City Engineer, of Toronto, the London Street Railway Co. will adopt a new idea in building additions to the bridges they propose to cross. Instead of extending the abut-ments they will sink steel cylinders filled with cement and erect the bridge extensions thereon —The City Engineer is preparing specifications for the paving of Dundas and Richmond streets with asphalt and with vitrified brick. Tenders will be asked for both, and a choice made when the cost is ascertained.

Guelph, Ont.—Geo. Sleeman has commenced the erection of car and power houses for the proposed electric railway. They will be 102 × 45 feet each in size, built of stone. The power will consist of two boilers of 100 horse-power each. The construction of the road will be commenced at once, the first section to be built, extending from Mr. Sleeman's residence to the G. T. R. station.—G. R. Bruce, architect, will receive tenders until Friday next at 7 p. m. for the erection of a frame building for the Guelph Norway Iron and Steel Company.—M. O'Connor is asking for tenders until noon on Saturday next for brickwork, plumbing, tinwork and furnaces required on Aberdeen Terrace. Plans may be seen at the office of Geo. R. Bruce.

Hamilton, Ont.—It is stated that the Toronto, Hamilton and Buffalo railway will be operated jointly by the Canadian Pacific Railway Company and the Michigan Central Railway Company, and that construction of the line will be pushed forward as rapidly as possible.—On the subject of sewage interception, the City Engineer has prepared a report in which he recommends the erection of the necessary buildings for pumping engines and the construction of sewage pumps in duplicate, and estimates the cost of such at \$22,300. The following building permits were granted during the past week: Semmens & Sons, brick building on York street, cost \$1,000; Wm. Stewart & Son, alterations to brick building, corner Main and Catharine streets, cost \$1,300, and a brick residence on Emerald street south, cost \$3,000; M. Basquil, two-story brick dwelling on Wilson street, cost \$1,000; city corporation, a press house on John street, cost \$1,000; S. Howard, two-story brick dwellings on John street north, cost \$1,400; Thomas Lovejoy, two two-story brick dwellings on Smith avenue, cost \$2,200.—Plans of the G. H. & B. station will be ready for contractors to figure on next week. The architects are Wm. Stewart & Son.

MONTREAL, QUE.—Tenders for waterworks supplies for one year will probably be called for during the present week.— The Town Council of Westmount, a suburb of Montreal, has resolved to submit a by-law to the electors to authorize a loan of \$100,000 for the construction

and operation of a gas plant.—A. Pringle, secretary, invites tenders until 5 p. m. on June 20th next, for the construction of wing dams, masonry and excavation for head and tail races for the proposed Lachine Rapids Hydraulic and Land Co., which proposes to develop the water of the Lachine rapids. Plans may be seen at the office of W. McLea Walbank, 214 St. James street.—A petition has been signed by the residents of Notre Dame street west, asking that a portion of the street be paved with asphalt. The question will be considered at the next meeting of the Road Committee. Andrew Allan, Huth A. Allan, Andrew A. Allan, lames B. Allan, A. A. McKenzie and Chas. McEachran, of this city, and Bryce T. Allan, of Boston, are applying for power to incorporate the Langenburg & Southern Railway Company, to connect Langenburg in Assiniboia, with the Canadian railway line between Red Jacket and Elkhorn.—The scheme for a cold storage warehouse is assuming definite shape. The sum of \$100,000 has been subscribed, and the organization of the company will be completed at an early date. Plans for a six storey building 200 × 120 feet, have been prepared.

OTTAWA, ONT.-The Department of Justice invites tenders until the 22nd of June, for various supplies required at the Kingston, St. Vincent de Paul, Dorchester, Manitoba and British Columbia penitentiaries, and at Regina jail. The supplies include flour, beef and mutton, forage, coal, wood, lumber, hardware, groceries, dry goods, drugs, leather and findings.— Tenders are invited by the Department of Marine until the 10th of June, for the erection of a light house and fog signal service on the Western Islands, which lie about ten miles northwest of the Christian Island group, on the Georgian Bay, off the shore of East Simcoe.—The Dominion supplementary estimates were presented to the House last week, among which are the following appropriations: \$8,000 for the Rideau canal; \$10,000 for the Beauharnois canal; \$3,000 for the Chambly Canal; \$11,000 for the Cornwall canal; \$12,000 for Farran's Point canal; \$7,000 for St. Peter's Canal; \$3,500 for the Galops canal; \$2,500 to complete the Brandon Industrial school, and \$9,000 for continuing artesian borings in the Northwest Territory.-Tenders for the erection of additions to the Protestant Home for the Aged, Bank street, are invited by A. Pratt, Chairman Building Committee, until noon of the 31st inst. Plans may be seen at the office of James Mather, archi-

WINNIPEG, MAN.—The new ware-house to be erected by J. H. Ashdown, on the corner of Rorie street and Bannatyne avenue, will be five stories high, and 80 × 135 feet in size. The estimated cost is \$30,000. S. Frank Peters is the architect. Tenders for the purchase of \$65,000 of school debentures are invited by W. D. Bole, Chairman Finance Committee, until noon of the 28th June. Particulars may be obtained from Stewart Mulvey, Secretary-Treasurer. - C. H. Wheeler, architect, is asking for tenders until 4 p. m. on the 30th inst. for the erection of a block of stores for Campbell Bros.—Messrs. Grant & Foley, contractors for the Winnipeg and Great Northern railway, are having plans and profiles of the road prepared, preparatory to letting the contract for grading. It is expected that work will be commented early in June.-The Public School Board will call for tenders at once for rebuilding the Mulvey School. Mr. Geo. Browne, architect, will have charge of the work. At the next meeting of the Board the Building Committee will present a report on the new school buildings proposed to be erected this year, and also on alterations to existing buildings. It is proposed to erect a twelve-roomed school house on the Dufferin site. Mr. C. H. Wheeler has written to the Board, urging the advisability of proceeding at once with the erection of the proposed school in the north end.—Messrs. Kelly & McCutcheon have submitted a proposition to the Board of Works to put in a plant for the manufacture of vitified brick for paving purposes, and the matter has been forwarded to the Council. The city is asked to purchase from the firm all the brick required during the next ten years, at \$16 per thousand for the first five years, and \$15 for the last five.

TORONTO, ONT.—Tenders are being received by Mr. F. H. Herbert, architect, for the erection of a large summer residence and out-buildings at Fisher Island, Muskoka, for Mr. Wm. Caldwell. Wm. Harty, Commissioner of Public Works for Ontario, will receive tenders until noon on Saturday, the 1st of June, for the fol-lowing works: residence of the Medical superintendent, Mimico asylum; rubber fire hose and reels for the Reformatory for boys. Penetanguishene, and for the Deaf and Dumb Institute, Belleville; hot water apparatus for superintendent's residence, Mimico Asylum, and for the court room at Port Arthur, Thunder Bay District; one steam boiler for agricultural college, Guelph, and two steam boilers for the Central prison, Toronto; one steam boiler in basement of new Parliament buildings, Toronto, and one steam pump at Brockville asylum. Plans and specifications may be seen at the Department of Public Works.-A Court of Revision will be held on the 4th of June for the purpose of hearing appeals against the assessments for the following works, proposed to be constructed by the city: Cedar block roadway on Oxford street, from Spadina ave. to Augusta ave., cost \$2,100; block roadway on D'Arcy street, from Spadina ave to McCaul street, cost \$4,067; cement concrete pavement and an 18 inch cement walk on lane east of Bay street, from Melinda to Wellington street, cost \$600. The City Engineer has reported that the construction of a number of groins is necessary to protect the south shore of the island.—The City Council has decided to establish a system of waterworks for the island, at an estimated cost of \$15,000, and tenders for the necessary plant will be asked for at once. The pumping engines will have a daily capacity of \$500,000 gallons. The construction of permanent pavements to the value of \$150,000 has also been sanctioned by the Council.—Building permits have been granted as follows: J. H. Lennox, 108 Amelia st., pr. s. d. 2 story bk. dwelling; Langmuir Mig. Co., 3 story bk. extension to factory, cost \$4,000; Kilgour Bros., alterations to stores, 18, 20, 22 Front st. west, cost \$9,000; Dr. C. Sheard, alterations, 501 Yonge street, cost \$1,000; Hy. Stevens, 228 Dunn ave., det. 2 story and attic bk. dwelling, cost \$2.500.—Messrs. Post & Holmes, architects, of this city, are preparing plans for a church at Goderich, to cost \$15,000.

FIRES.

Fire at Bedford, Que., on the 24th inst., destroyed A. Dupuis' wheelright shop, P. Chaussie's tailor shop and dwelling, Eugene Cyr's carriage shop, and A. Farber's bakery and dwelling house. Small insurance.—The Havelock Mineral Spring Co.'s warehouse and bottling factory at Moncton, N. B., was destroyed by fire a few days ago. Partially insured.—The saw mill of Powell & Kelltie, at McCool's siding, about 25 miles east of Ottawa, on the Canada Atlantic railway, was burned on the 22nd inst.—The general store of M. J. Morrill, at Florence, Ont., was burned on the 24th inst. Loss \$5,000.—The establishment of William Thomas & Co., wholesale furriers, St. Paul street, Montreal, was recently damaged to the extent of \$20,000, the loss

being covered by insurance. - Boyd, Gillies & Co.'s wholesale paper warehouse in Montreal, was damaged by fire on the 26th inst. The loss is placed at \$40,000.—At Aylmer, Ont., fire last week destroyed the organ factory of John Rowe, the planing mill of Charles Price and the destroyed the organ factory of John Rowe, the planing mill of Charles Price, and the residence of Alex. Summers, the losses being \$2,000, \$5,000 and \$3,000 respectively, partially covered by insurance.—At Arva, Ont., on the 23rd inst. fire destroyed Chas. Smith's woodworking shop, Wm. Thomson's shoe store and dwelling and Wm. Wyatt's paint shop, all partially insured.—Seven buildings at Sincoe, Ont., were destroyed by fire on the 24th inst. were destroyed by fire on the 24th inst. Following are the losses: J. H. Landon, \$2,000; J. S. Spain, \$1,500; Mrs. Cairns, Mansion House, \$3,000; Charles Sihler, \$2,000; E. E. Collins, \$1,500; W. F. Carl, \$1,000.—A woodworking factory on Alice street, Toronto, owned by R. B. Elgie, was gutted by fire last week. The loss on building is placed at \$5,000. loss on building is placed at \$5,000, covered by insurance.

CONTRACTS AWARDED.

ST. HYACINTHE, QUE,— J. Alcide Chausse, architect, of Montreal, has awarded the following contracts tor the new hotel to be erected on Girouard street for Mr. Cleophas Pagnnelo: exca vating, masonry, brickwork and plastering, Vital and John Arbour; woodwork and steel work, L. P. Morin; painting and glazing, N. Beaunoyer; plumbing and heating, Adrien Blondin; toofing, J. H. Morin.

TORONTO, ONT.—In the CONTRACT RECORD of the 23rd inst., it was stated that the Toronto Radiator Mfg. Co. had been awarded the contract for heating the public building at Brantford. It should have read that the radiators were being supplied by this firm, who are manufac turers only, the contractors for the work being Purdy, Mansell & Mashinter, of this city.—The Parks and Gardens Com-mittee have accepted the tender of Medler & Arnott for the new sheep pens at the Exhibition grounds. Their tender was

\$5,380.
WINNIPEG, MAN.—Tenders were last week received as follows by the Committee on Works, for the construction of the superstructure of the Osborne street bridge: The Gillett Herzog Manufacturing Co., Minneapolis, \$9,792; Hamilton Bridge Works, \$9,880; Central Bridge and Engineering Co., Peterboro, Ont., \$9,255; Dominion Bridge Co., Montreal, \$7,260; Hunter Bros., Kincardine, Ont., \$10,300; King Bridge Co., Cleveland, Ohio, \$9,500; Chicago Bridge and Iron Co., \$9,000; Wisconsin Bridge and Iron Co., \$9,000; The tender of the Dominion Bridge Co. has been recommended for acceptance. For the construction of the tee on Works, for the construction of the acceptance. For the construction of the Colony Creek bridge the tender of R. H. Kennedy and James Meryew has been accepted at \$750.

SUDBURY, ONT.—The contract for the construction of a system of sewerage and (Continued on page 4)

WILLIS CHIPMAN, B.A.Sc.

M. Can. Soc. C.E.; M. Am. Soc. C. E.; M. Am. W. W. Ass'n.

CIVIL AND SANITARY ENGINEER

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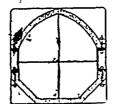
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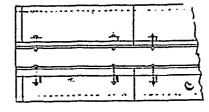
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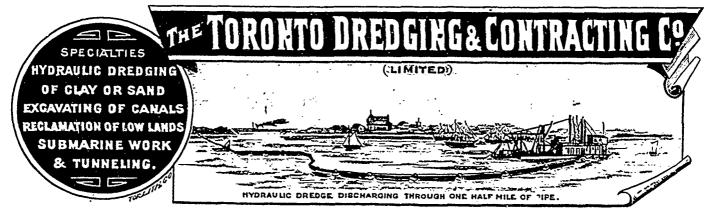
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MUNICIPAL ENGINEERS, CONTRACTORS AND MATERIALS

waterworks for the town was awarded on the 18th inst. to McCarthy & Plummer, of Sherbrooke, Que, and Sault Ste. Marie, of Sherbrooke, Que., and Sault Ste. Marie, Ont., the contract price, including an electric light plant, being \$40,650. John Askwith, Ottawa, \$75,000; Clark & Connolly, Toronto, \$49,900; Lindsay, Burdett & Co., Collingwood, \$42,000; McQuillan & Co., Toronto, waterworks only, two tenders), \$33,000 and \$24,931; James McDougall, Caledonian Iron Works, Montreal, pumping engines, boilers, water tank, valves, hydrants, etc., \$7,290; Lipsett & Gregg, Sault Ste Marie, Mich., labor on waterworks, \$13-875, sewerage complete, \$13,812 50; J. B. Hill & Co., Niagara Falls Centre, Ont., tendered at so much per running foot.

tendered at so much per running foot.

HAMILTON, ONT. — The tender of
Andiew Ouderdonk is said to be the
lowest for the construction of the proposed tunnel for the Toronto, Hamilton
and Buffalo railway, but the directors have
deferred its acceptance pending investigadeferred its acceptance pending in-tion as to his possession of the necessary appliances to do the work properly. The figures have not been given out, but the cost of the tunnel will be about \$300,000.

The Building Committee of the Centenary church have accepted tenders for improvements as follows: brickwork, G. E. Mills; carpenter work, Reid & Taylor; plastering, Hannaford Bros.; ironwork, J. Wallace & Son; electric light wiring, Lowe & Farrell; electric light and gas fixtures, American Copper Co., Toronto; frescoing, Boothman & Hutchison. The cost of the work will be about \$13,000.

cost of the work will be about \$13,000. MONTREAL, QUE.—W. G. Reid, contractor for the Atlantic and Lake Superior railway, has sub-let the contracts for the timber structures, trestles, culverts, cattle guards, etc., in three sections, the contractors being John Brown, Gagherty & Co., and Brennan & Co. The chief engineer of construction is J. M. Shanly. —It is announced that Bellhouse, Dillon & Co., of this city, have secured the Dominion Government contract to supply 25,000 casks of Belgian cement for canal work. The price is given at \$1.94 per cask.—Eric Mann, architect, has awarded contracts for a warehouse and varnish factory, corner Manufacturers and St. Patrick street, for McCaskill, Douglas & Co., as follows: masonry, Heggie & Stuart; brick, A. E. Wand; carpenter and joiner's work, R. Chartrand.—J. B. Resther & Son, architects, have awarded contracts for a convent for the Sisters of Ste Croix des Sept Douleurs on Mount Royal avenue as follows: masonry and minion Government contract to supply Ste Croix des Sept Douleurs on Mount Royal avenue as follows: masonry and brickwork, Maitineau & Prenoveau; carpenter and joiner's work, iton work, and plastering, A. Peneault; roofing, plumbing, heating and electric wiring, Lessard & Harris; painting and glazing, T. Lenoir.—J. and H. C. Nelson, architects, have awarded contracts for a new transept and Sunday school for the church of St. James the Apostle, St. Catherine street as follows: masonry and brickwork J. H. Hutchison; carpenter and joiner's work, W. McDonald; roofing, Geo. W. Reed; plumbing and heating, J. W. Hughes; plastering, Decary & Son; painting, R. H. Bartholemew.—Mr. W. McLea Walbank, architect, has let contracts as follows, for a stone front and alterations to a store on St. James street alterations to a store on St. James street for the Molson estate: stone work, for the Molson estate: stone work, Whighton & Morrison; carpenter and joiner's work, James Shearer; iron work, Dominion Bridge Co; plastering and mosaic work, J. McLean, plumbing and heating, R. Mitchell & Co.—Roy & Gauthier, architects, have awarded contracts for a tenement house on Sherbrooke street for Mr. M. Martin as follows: brick work, B. Trigon; carpenter and joiner's work, A. Lawrence; roofing, plumbing and heating, Pelletier & Brosplumbing and heating, Pelletier & Brosseau; plastering, H. Contant.

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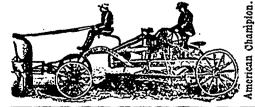
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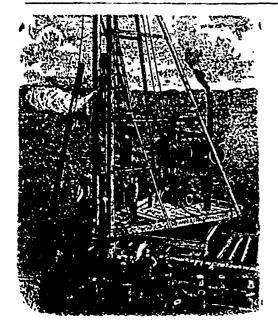


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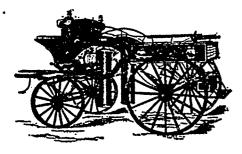
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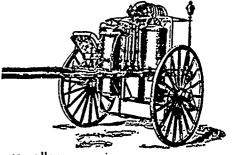
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MUNICIPAL DEPARTMENT

SEWAGE DISPOSAL IN ONTARIO.*

By R. W. THOMSON, B.A.Sc. (Continued from last issue.)

"That the most desirable method of disposing of sewage is by land irrigation wherever this is practicable. This method is especially important for cities and towns situated inland, or on such rivers and streams as are or may be used for public water supplies.

"Inasmuch as it has at times been found necessary (especially in older countries where the land is expensive, and the best land for sewage farms is not always available) to concentrate the sewage, some method of precipitating the suspended organic portion of it has to be adopted.

"In every instance, however, where the town to which sewage disposal is applied is situated on a lake or river whose pollution may possibly affect a public water supply, it is found necessary with every precipitation method to cause the passage of the effluent from the precipitation works to a land area for filtration."

The above defines very clearly the stand at present taken by the Provincial Board of Health, and it is probable the tendency will be to incline to greater strictness as the Province develops.

In France, Germany, England, and the United States, the purification of sewage by application to land has been proved to be a success even in cases where the combined system of sewerage is in operation. There are a few 'solated cases where its opponents claim it has been a failure, but, if a failure at all, the failure has been due to carelessness in attendance, or else it has been a case of putting fertilization before purification. It is most instructive to read instances of the purifying power of earth when under favorable conditions. At Gennevilliers, in France, experiments were made to ascertain this power. Large tanks were constructed, filled with earth to a depth of six feet, and underdrained. Sewage at the rate of 24,000 cubic metres per hectare in six months was applied, and out of this only 1,600 cubic metres reached the drains below, nearly fourteenfifteenths being evaporated. The above quantity is equivalent to about 14,000 gallons pet acre per day, or at 60 gallons per person per day is equivalent to 232 persons per acre. Of course, this by no means represents the total capacity of the land, other experiments at the same place having demonstrated that in permeable lands the yearly irrigation may reach 100,-000 cubic metres per hectare, or, on the same basis as before, 500 persons per acre. At Breslau, where storm water is admitted, the proportion reaches 400 persons per acre.

*Abstract of paper read before the Engineering Society of the School of Practical Science, Toronto.

An idea of the degree of purification reached by filtration at Gennevilliers may be best obtained by comparing the following results of bacteriological analysis:

An extensive series of experiments in sewage purification has been also carried on at Lawrence, Mass., under the direction of the Massachusetts State Board of Health. Space will not permit of our going into the details of these experiments, but we may note some of the conclusions to be deduced from them, which are:

- (1) In order to get the best results, it is imperative that the sewage be applied to the land intermittently.
- (2) That the capacity of earth to purify increases with use, under proper conditions, up to a maximum depending on the quality of the soil.
- (3) That the application of sewage to land is at present the only practicable method of purification.
- (4) That the process of purification is due to the work of minute organisms in the soil, which convert the organic matter of the sewage into harmless inorganic substances capable of sustaining plant life.
- (5) That the process of nitrification or purification goes on between 32° and 130° Fahr., and is most active at about 100° Fahr.

In one experiment the necessity for intermittent application was shown more conclusively. While acting intermittently the filter removed 99.2 per cent. of the sum of the ammonias in the sewage, but when kept continuously saturated the sum of the ammonias in the effluent gradually increased until they exceeded those in the sewage, some of those previously stored in the filter escaping. The sewage was then applied intermittently as before, when the nitrates in the effluent began to rise, until they exceeded the ammonias in the sewage by fifty per cent., the impurities collecting during the continuous filtration becoming nitrified. After three months the effluent was again porer than the average drinking water of the state. In each case the amount of sewage treated was the same, the difference in purification being entirely due to the different methods of treatment. In speaking of the purity of the effluent treated by intermittent filtration, the amount treated being from 117,000 gallons to 60,000 gallons per acre, the report says: "We have found that the sum of the ammonias which have been taken to indicate the amount of nitrogenous organic matter has been reduced to 0.5 of one per cent. of those in the sewage, and is less than the sum of the ammonius of most of the public drinking water supplies of the state." One result of these experiments has been to bring the question of sewage purification more forcibly before the people, and to demonstrate, in response to the constantly increasing demand for some system of sewage purification, that the only practicable method where purification, and not simply classification is required, is to apply the sewage to land.

The stand taken by our Provincial Board of Health, together with the interest that is being aroused in local sanitarians, due to the imperative demand of our increasing population for some practical and economical method of sewage disposal, is being already felt.

(To be Continued.)

INVERTED SYPHONS ON THE PARIS

DRAINAGE WORKS. In the extension of the se-vage disposal works of Paris, says the Engineering Record, it was designed to relieve the river Seine of all the polution resulting from the turning into it of an amount of sewage estimated at 360,000 cubic yards daily. The irrigation farms at Gennevilliers have already covered 1,900 acres, and no more land was available there. Accordingly a more remote district has been selected at Archères on the northeastern boundary of the forest of St. Germain and along the left bank of one of the bends of the river Seine. The extension of the works include a new pumping station at Colombes, equipped with four groups of pumps, each of 300 horse-power, which will lift the sewage 115 feet. These pumps deliver into four pipes 43.3 inches in diameter and built of steel plates. These pipes are carried across the Seine under the girders of a road-bridge. From this point to Herblay opposite the new irrigation area the sewage is carried in two iron mains of 75.8 inches in diameter laid within a gallery or conduit of steel and cement concrete. At Herblay the line is taken across the Seine by an inverted syphon consisting of a double line of pipes 39.37 inches in diameter. These are built of steel plates 0.71 inch thick, are placed parallel to each other and 20 inches apart, and are connected at intervals of 10 feet by a braced framing. The total length of each pipe is 668 feet. The pipes are not laid horizontally but are curved to follow the bed of the river. Before setting them in place a trench 13 feet wide was excavated in the river bed and a uniform bearing was made in the bottom of the trench with concrete. The double syphon complete weighed 259 tons. The pipes when built and connected were placed on a floating stage moored along one side of the river. Guiding piles were driven in the bed of the river on each side and a staging was erected on them. The pipes had been closed at the ends so that ample flotation was secured, and they were then towed out into the stream and brought immediately over the trench. They were laid in position against the guide piles and loaded with rails until they sunk upon the bed prepared for them in the bottom of the trench. When a fair bearing had been secured water was admitted into the pipes and divers were sent down to remove the rails. The pipes had been tested before laying to a pressure of 90 pounds to the square inch, and they were finally covered with cement concrete. It was necessary to impede the navigation of the river as little as possible and the work was completed within three days'

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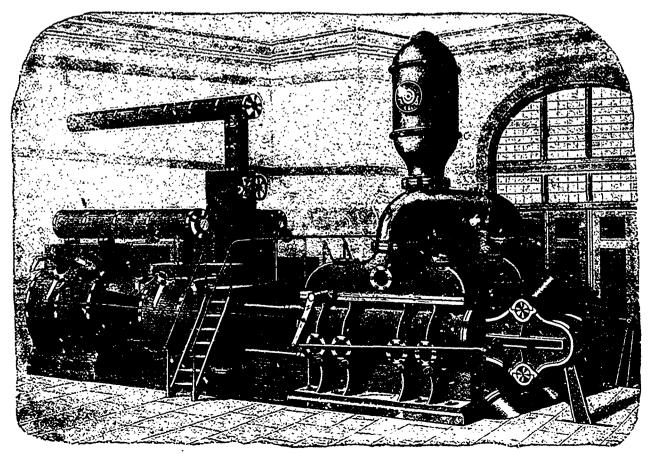
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CONDITION OF THE MARKET,

TORONTO: The situation remains without any change worthy of note, a steady trade being done in nearly all lines. General hardware shows a slight improvement in the past week. The arrivals of imported cement are large, and prices, steady at \$2.60 to \$2.90 for the best Portland. Firebricks are quiet. Large shipments of galvanized iron from stock are being made, and the trade in this line is improving. Glass and paints and oils are also moving freely. Copper has advanced 1/3c, per lb.

MONTREAL: During last week the arrivals of cement at this port were 7,625 barrels, of which 3,475 barrels were Belgian and 4,150 English. Business continues very active for western and local account, and some good sales have been put through at \$1.92 to 2.05 for English and \$1.70 to \$1.85 for Belgian. The receipts of firebricks for the same week were \$95,000. An improved enquiry is noted for glass, and we quote \$1.15 to \$1.20 for first break and \$1.25 to \$1.30 for second. In other lines there is little change to note.

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| SAND. | 40d, hot cut, per 10 lbs 2 25 2 15 |
| Per Load of 11/2 Cubic Yards 1 25 1 25 | 20d, 16d and 12d, hot cut, per |
| STONE. Common Rubble, per toise, | 10d, ho: cut, per 100 lbs 2 40 2 30 |
| delivered 14 00 14 00 | 8d, 9d, 11 11 245 235 6d, 7d, 11 11 260 250 4d to 5d, 11 11 270 270 3d, 11 11 320 310 |
| Large flat Rubble, per toise, delivered 18 00 18 00 | 4d to 5d, " " 2 70 2 70 3d, " " " 3 20 3 10 |
| Foundation Blocks, per c. st. 50 50 Kent Freestone Quarries Moncton, N. B., per cu | ad, " " " 373 360 4d to 5d cold cut, not polished |
| Moncton, N. B., per cu ft., f.o.b | or blued, per 100 lbs 280 260 3d to 5d cold cut, not polished |
| ft., f.o.b | or blued, per 100 lbs 320 300 |
| Ballochmyle | ###################################### |
| Granite (Stanstead) Ashlar, 6 | 2d, " 4 35 4 10 |
| in. to x2 in., rise 9 in., per ft. Moat Freestone | CASING AND BOX, FLOORING, SHOOK AND TOBACCO BOX |
| Thomson's Gatelawbridge, cu. R. 75 80 Credit Valley Rubble, per car | 12d to 3od, per 100 lbs 2 70 2 60 |
| of 15 tons, at quarry 8 00 Credit Valley Brown Cours | 8d and 9d, " " 295 295 |
| ing, up to ro inch, per sup. yard, at quarry 175 325 | 4d to 5d, " " 3 30 3 20 |
| Credit Valley Brown Dimen- | 3d, " " 370 360 |
| Credit Valley Grey Coursing, per superficial yard 1 50 200 2 15 | Finishing rails. 3 inch, per 100 lbs. 3 c5 2 95 |
| Credit Valley Grey Dimen. | 2½ to 2½ "" " 220 3 to 2½ " " " 3 35 3 25 |
| Clark's N. B. Brown Stone, | 1½ to 1¾ " " 4 45 3 45 |
| per cubic foot, f.o.b 1 15 1 00 Brown Free Stone, Wood- point, Sackville, N.B., per | 174 1 3 95 3 85 1 4 45 4 35 |
| cub. ft | SLATING NAILS. 5d, per 100 lbs |
| MadocRubble, delivered, per toise | 4d, " " 3 05 2 95 |
| Madoc dimension floating, f. o. b, Toronto, per cubic ft. 30 32 | 3d, " " 8 45 3 35 2d, " " 3 95 3 85 |
| ohio freestone, from the grafton stone co.'s | COMMON BARREL NAILS. 1 inch, per 100 lbs |
| QUARRIES. No. 1 Buff Promiscuous 70 85 | 3 " " " 3 70 3 65 |
| No. 1 Buff Dimension 75 90 | % 445 435 CLINCH NAILS, |
| No. 1 Blue Promiscuous 55 70 No. 1 Blue Dimension 60 75 Sawed Ashlar, No. 1 Buff, | 3 inch. per 100 lbs. 2 05 2 05 |
| any thickness, per cub. ft 90 1 05 | 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 |
| Sawed Ash'ar, No. 1 Blue, any thickness, per cub. ft 75 90 | 114 " 410 410 |
| Sawed Flagging, per sq. ft., for each inch in thickness. 061/2 071/2 | x 460 460 |
| Above prices cover cost freight and duty paid. For small lots red 5 to 10 cents per cubic foot. | SHARP AND PLAT PRESSED NAILS. inch, per 100 lbs. 3 45 3 45 |
| Quebec and Vermont rough granite for building pur- | 2½ and 2½ """ 3 60 3 60 |
| poses, per c.ft. f.o.b. quarry 33 1 50 For ornamental work, cu. ft. 35 2 0 | 1½ and 1¼ " " 395 395 |
| Granite paving blocks, 8 in. to 12 in. x 6 in. x 4 1/2 in., per M 50 00 | 1 460 460 |
| Granite curbing stone, 6 in.x | STEEL WIRE NAIIS. |
| SLATE. | Steel Wire Nails, 75, 10 and 5 % discount from printed list. |
| Rocfing (3 square). 11 red 18 00 20 00 | Iron Pipe: 6c. |
| n purple 9 00 10 00 n unfading green 12 00 6 20 | 0 0 78 0 0 7 0 0 72 0 0 7 0 0 72 0 0 87 0 0 74 0 0 12 |
| " black 6 00 5 50 Terra Cotta Tile, per sq 25 00 | 11 11 34 11 11 12 11 11 11 11 127# |
| Ornamental Black State Root- | 11 11 1 1 1 1 1 1 24 |
| ing | u 1 2 u u |
| White lead, Can., per 100 lbs. 6 25 5 50 5 50 6 00 | Black wrought iron pipe, 70% off above prices. Galvanized 50% |
| " zinc, Can., " " 650 750 750 800 Red lead, Eng 400 500 5 6 | Cast and soil " " 57% " " Lead Pipe: |
| " venetian, per 100 lbs 1 60 1 75 1 60 1 75 1 60 1 75 vermillion 90 1 00 90 1 00 | Lead pipe, per lb 7c. |
| " Indian, Eng 10 12 10 12 Yellow ochre 5 10 3 5 | Waste pipe, per lb |
| Yellow chrome 15 20 15 20 Green, chrome 7 12 7 12 | lots; 30 and 10 % off in ton lots; points east of Toronto, 35 and 10 % off. |
| " Paris 20 25 14 20 Black lamp 15 25 12 25 | Galvanized Iron: |
| Blue, ultramarine | Adam's—Mar's Best and Queen's Head: 16 to 24 guage, perib 4½c. 4¾c. |
| " " boiled " 57 63 63 68 | 26 guage, " 4¾ 5 28 " 5 5¼ |
| Fully 274 272 274 272 | Gordon Crown— 16 to 24 guage, per lb 4½ 4½ |
| Whiting, dry, per 100 lbs 75 100 60 75 Paris white, Eng., dry 90 1 25 90 1 00 | 26 guage, " 4½ 4¾ 28 " 4¾ 5 |
| Sienna, burnt 10 15 12 15 | Note.—Cheaper grades about 1/2 c. per lb. less |
| Umber, " 8½ 12 12 15 | Structural Iron: Steel Beams, per 100 lbs 275 250 |
| OEMENT, LIME, etc. Cement, Portland, per bbl 260 290 180 205 | " channels, " 285 260 |
| " German " 325 255 265 | " tees, " 280 265 |
| n Newcastle " 250 275 100 200 | Sheared steel bridge plate 255 235 |
| | Samuel S |