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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.

SEPTEMBER 12, 1895

No. 32.

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.

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Price, \$1.5c; to subscribers of the CANADIAN ARCHITECT AND BUILDER, \$1.00. Address

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TENDERS WANTED

Work Drainage

Sealed tenders endorsed "Tender for Drainage," and addressed to J. A. Cockburn, Crysler, Ont., will be received up to the hour of 8 o'clock p. m. on FRIDAY THE 20711 DAY OF SEPTEMBER, 1895, for the deepening, widening, straightening, etc., of Johnston Drain (main and south branch) in the 7th, 8th and 9th concessions of the Township of Finch.

Estimated cost of main drain Estimated cost of south drain \$2,420.80 579.16

Plans and specifications to be seen at the offices of J. A. Cockburn, Crysler, Clerk of the Township of Finch on and after Friday, the 6th day of September, 1295.

Work to be completed 1st September, 1896. The work is divided into 2 sections, main branch and south branch, and tenders will be received for the whole work or in sections.

The lowest or any tender not necessarily accepted.

F. D. McNAUGHTON, Reeve, South Finch P. O.

J. A. COCKBURN, Clerk, Crysler P. O. Crysler, and September, 1895.

Tenders for the various trades required in the erection of

ST. PETER'S CHURCH, CODERICH

will be received up to 5 p.m. on THURSDAY, THE 10TH DAY OF OCTOBER.

Tenders to be addressed to the Rev. F. West, Goderich, Ont.

The lowest or any tender will not necessarily be accepted.

Plans and specifications can be seen at the Presbytery,

Plans and specifications can be seen at the Presbytery, Goderich, Ont., and at the office of

POST & HOLMES, Architects, Manning Arcade, Toronto.

Y.M.C.A. TENDERS

Bulk or separate tenders will be received at our office until 5 p.m.

Wednesday, Sept. 18th, 1895,

for all the works required in the erection of a new

Young Men's Christian Association Building at London, Ontario.

Lowest or any tender not necessarily accepted.

MOORE & HENRY, Architects, London, Ont.



Tenders will be received by registered post, addressed to the City Engineer, Toronto, up to 11 o'clock a.m. on SATURDAY, SEPTEMBER 14TH, 1895 for the following works:

CEDAR BLOCK PAVEMENT

On Baldwin Street, from Beverley Street to Spadina

On St. Patrick Street, from Beverley Street to Spa-dina Avenue.

MACADAM ROADWAY

On Beverley Street, from Queen Street to College Street.

Street.

Specifications may be seen and forms of tender obtained on and after Monday, September 9th, 1895, at the office of the City Engineer, Toronto.

A deposit in the form of a marked cheque, payable to the order of the City Treasurer, for the sum of 5 per cent. on the value of the work tendered for up to \$1000, and 2½ per cent. on the value of the work over that amount, must accompany each and every tender, otherwise it will not be entertaired.

The tenders must bear the bona fide signatures of the contractor and his sureties, or they will be ruled out as informal.

The lowest or any tender not necessarily accepted.

DANIEL LAMB, Chairman Committee on Works.

Committee Room, Toronto, Sept. 4th, 1895.

A. J. Evans, contractor. Kincardine, Ont., has assigned.

Cusson & Beaucier, roofers, of Montreal, have dissolved.

CONTRACTS OPEN.

LANARK, ONT .- T. B. Caldwell will erect a saw mill here.

CAYUGA, ONT .- The Masons have subscribed \$10,000 for their new hall.

FLEMING, MAN.—R. Chappell is about to erect a large store and dwelling.

AYLMER, ONT.—C. A. Price purposes building a planing mill at this place.

LACHUTE, QUE.—An agitation is on foot to secure a proper system of water supply.

AVONMORE, ONT.—The question of building a High School is under consideration.

DEER PARK, ONT.—C. V. Mitchell purposes building a pair of houses on St. Clair avenue.

GANANOQUE, ONT.—The question of a site for the new High School has not yet been settled.

RENFREW, ONT.—J. L. Morris, C. E., of Pembroke, is endeavoring to form a company to build waterworks here.

CHATHAM, ONT.—The city will invite tenders for an electric fire alarm system, with 15 stations and all connections.

HARTLAND, N. B.—Government engineers have been examining the site for a new bridge across the river at this point.

YARKER, ONT .- B. F. McLoughlin is taking tenders for stone and brick work of a new Episcopal church to be built

AMHERST, N. S.—At a recent meeting of ratepayers it was decided to abandon the construction of a sewerage system for the present.

COLLINGWOOD, ONT.—Tenders are asked by the Town Treasurer until November 1st for the purchase of \$7,000 of debentures.

ALEXANDRIA, ALEXANDRIA, ONT. — The Public School Roard has decided to build a new school house. Work will be commenced at an early date.

. NANAIMO, B. C.—The question of submitting a by-law to the ratepayers for the construction of a system of waterworks is under consideration by the Council.

ACTON, ONT.—The National Electric Co. are installing an arc and incandescent lighting plant, and a power house, 20 × 30 ft. will be erected at once on Mr. Ebbage's property.

CARLETON PLACE, ONT.—The Town Council have invited Mr. Mather, architect, of Ottawa, to prepare plans for a fire hall and council chamber.—Purves' mill recently burned, will be rebuilt.

B. C.—Contracts for VANCOUVER, grading and other work will shortly be let for an extension of thirteen miles of the Arrow Lake branch of the C. P. R.— C. Hach is receiving tenders for a brick block on Cordova street.

QUEBEC, QUE.—The Dominion Cold Storage Company has made application for a site on the Louise embankment, 120

×60 feet, on which to erect buildings estimated to cost \$150,000. The Council will be asked to grant them exemption from taxation.

SOREL, QUE.—It has been definitely decided that the shops of the Richelieu and Ontario Navigation Company, which were burned down recently, are to be re's built here. The works include the boiler shop, tin shop, blacksmith and carpenter shops.

SANDWICH, ONT.—The County Council has decided to submit the question of the removal of the county buildings to a vote of the electors at the January elections, and for the present to repair the present buildings, at a cost of \$20,000. Mason & Rice, architects, of Detroit, will have charge of the work.

WOODSTOCK, N. B.—A special committee has recommended the construction of sewers in different sections of the town.

—Wm. M. Connell will build a threestory building on Queen street, containing stores and offices.—Chas. G. Connell is preparing to build a residence at the corne* of Chapel and Creen streets.

CRYLSER, ONT.—Tenders are invited by the Council, addressed to J. A. Cockburn, Clerk, until Friday, the 20th inst. for deepening, widening and straightening the main and south branches of the Johnston drain, in the 7th, 8th and 9th concessions of the township of Finch. Estimated cost of Main drain, \$2,420.80; of south drain, \$579.16. Plans may be seen at the Clerk's office.

HALIFAX, N. S.—The City Engineer has reported on the cost of an asphalt sidewalk on the east side of Brunswick street, from Jacob street to North street as follows: 5,031 square yards of asphalt, \$3,221.70; 200 feet of circular gutter at 68c., \$134; resetting 3,200 feet of curb, laying gutters and providing and resetting hatches and coal holes, \$3,410; macadamising street to new grade from Jacob street to Artz lane, 3,200 feet at \$1.00, \$3,200.00.—Fred. T. DeWolf, president of the Mutual Real Estate Company, will build three dwelling houses on his property.

WINNIPEG, MAN.—Ald. Sproule has given notice of a by-law to provide for the construction of a system of waterworks.—It is the intention of the Provincial Government to undertake the construction of two main channels connecting Netley Creek with a drainage inlet to the bog at the north end and Wavey creek with Jack Fish creek on the west side; also the construction of all necessary lateral channels, at a total estimated cost of \$80,000.—A three-story brick block is to be erected on the site of the building lately occupied by Campbell Bros., on Main street between Market and James streets.

OTTAWA, ONT.—The electric railway company will build a \$6,000 subway under the Parry Sound line at Hintonburg.—The Government has decided to pave the roadways and sidewalks on Parliament grounds. The footpaths will be of artificial stone and the roadways of asphalt. The work will cost about \$10,000.—The property owners are circulating a petition asking the City Council to pave with asphalt that portion of the roadway running from Maria to Ann street. The cost of the work is placed at about \$60,000. The City Clerk is receiving tenders this week for repairs to the By-Ward market.

LONDON, ONT.—The City Engineer is receiving tenders for a brick freight shed, brick engine house and frame coal dock.

Mr. Moore, superintendent of waterworks has submitted a report in regard to improving the city's water supply. He proposes to utilize Redmonds pond, laying about 10,000 feet of piping, and to construct a reservoir. The cost of excavating the reservoir and connecting it with

the pumping plant is as follows: Excavating 300,000 cubic yards, \$30,000; constructing 10,000 feet 10-inch cast iron pipe, \$10,000. Mr. Moore has also submitted a plan for increasing the storage capacity of the upper pond at Springbank from 881,250 gallons, at a total cost of \$9,500. The council will consider the matter.

MONTREAL, QUE.—Mr. P. A. R. Labelle, architect, is preparing plans for a six storey carriage factory on Osborne street for B. Ledoux & Co.—Mr. E. Vanier, C. E., is preparing plans for a drainage system for Cote St. Paul.—The St. Henri Council have decided to remodel the town hall.—Tenders for the laying of a sewer on Souvenir street St. laying of a sewer on Souvenir street, St. Cunegonde, will be called for at once.—A committee has been formed to promote the erection of a monument to the late Honore Mercier. The intention is to erect a monument valued at between \$30,000 and \$40,000.—Mr. A. T. Taylor, architect, is preparing plans for altera-tions to the Chateau museum.—The Imperial Brush Manufacturing Co. have decided to proceed at once with the construction of their works at the corner of Ontario and Joan de Arc streets, and have elected directors as follows: R. Forget, Jos. Brunet, H. Laporte, A. Desjardins and Bickerdike.—The Department of Railmays and Canals for the Dominion are asking for tenders until Tuesday, the 24th inst., addressed to A. Benoit, secretary, Ottawa, for renewing in part with galvanized iron the roof of the drill shed in this city. Specifications may be seen at the brigade office, drill shed, Craig street.

HAMILTON, ONT. -- Messrs. Stewart & Sons, architects, have been engaged to prepare plans for the new building for the Collegiate Iustitute and School of Pedagogy.—The Board of Works is considering the proposal to lay a block of experimental pavement on John street, between King and King William streets. Engineer Haskins estimates the cost of various sorts of pavement per square yard as follows: macadam, 50 cents; cedar blocks, 70 cents; gas-tar asphalt, \$1.75; vitrified brick, \$2.05; Trinidad asphalt, \$2.50; rock asphalt, \$3; concrete, without any covering, 80 cents.—The report of Mr. Keating, City Engineer of Toronto, on the improvement of the Hamilton waterworks system will be presented to the Council at an early date. At the last meeting of the Finance Committee an application was received from the Hamilton Radial Electric Railway Company, asking for right of way from Sherman avenue west in Cannon street. The intention of the company is to build an electric railroad from the Falls to Toronto via Hamilton. The application was sent on to Council. The request of the To-ronto, Hamilton and Buffalo railway for an additional bonus was thrown out.—The Finance Committee will be asked to provide funds for the paying of the portion of King street, east of Gore Park, yet unpayed. The cost will be between \$2,000 and \$4,000.

TORONTO, ONT.—Ex.-Ald. Pells proposes to commence work at once on a new theatre building, at the corner of King and Frederick streets, the site for which is now being prepared. The building will be three storeys high, with balcony and gallery and entrances from both streets. Estimated cost \$65,000.—The new building to be erected at the corner of Queen and Yonge streets for Philip Jamieson will be of brick, four storeys, and will cost \$27,000.—The City Council has given notice that the following work will be carried out: on Berkeley street, from Gerrard street to Carlton street, cost \$3,020; asphalt roadway on Wellesley place Wellesley crescent to Wellesley lane, cost \$3,315; macadam roadways on Adelaide street, Spadina avenue to

Bathurst street, cost \$2,500; on Elizabeth street, Queen street to College street, cost \$3,460; on Sheppard street, Adelaide to Richmond street, cost \$520; Anderson street, Simcoe to McCaul street, cost \$400; on Beverley street, from Queen to College street, cost \$16,800.—Mr. Macdougall, County Engineer, is locating the extension of the suburban electric railway from Toronto Junction to Islington.—Mr. Henry Simpson, architect, is preparing plans for a new hotel to be erected by Jethro Worden, on the site of his present hotel. The new building will be classic in design, of ied pressed brick and cut stone.—The City Council has decided to again submit a by law to the ratepayers authorizing the construction of a tunnel across the bay. The vote will be taken on October 5th.—At a meeting of the Property Committee held on Monday last the Cobban Manusacturing Company were given an additional eight seet of frontage on which to erect their factory on Lake street.—Building permits have been granted as follows; Philip Jamieson, 4 story bk. store, n. w. cor. Queen and Yonge streets, cost \$27,500; Nicol Kingsmill, I story bk. add., rear 100 Yorkville ave., cost \$1,000; S. Brown, 202 Sherbourne st., 2 story bk. add. rear 165 Adelaide st. w., cost \$1,200; Josiah Palmer, 235 Elizabeth st., pr. s. d. 2 story and attic bk. dwellings, e. side Dussern st., opposite Huxley st., cost \$3,000.

FIRES.

The residence of James Knowles at Longueuil West, Que., was destroyed by fire last week.—Wm. Clark's shingle mill at Stephenson, Ont., was destroyed by fire recently.—The town of Liverpool, N. S., was almost completely wiped out by fire on the 8th inst., all the principal buildings being destroyed. The loss is placed at \$75,000, with about \$20,000 insurance.—A row of tenements on St. Vincent street, Montreal, were burned on Monday. Loss \$15,000.—Several buildings at Arthur, Ont., were burned on Monday last, among which were C. Blackwood's store, Sawyer's shoe store, and R. Wood's drug store.—The mill of the Robin Hood Smokeless Powder Co., at Winnipeg, Man., was recently burned.—Damage to the extent of \$10,000 was occasioned at Frankford, Ont., on the 10th inst. Among the losses are: Foster's block, \$4,500; Bostrom block, \$4,500; James Foster's machinery hall, \$1,000.

CONTRACTS AWARDED.

HAMILTON, ONT.—The contract for a sewer on Hunter street has been let to D. Beer, at 38 cents a foot.

SARNIA, ONT.—Alex. Joss has secured the plumbing and heating contract for the new hospital here.

ST. JOHN, N. B.—G. & E. Blake have been given the contract for heating apparatus for the Erin street school.

GUELPH, ONT.—The Guelph Pavement Co. have been awarded the contract for laying cement sidewalks in the town of Elora.

DUNDAS, ONT.—The Council has accepted the tender of the Hamilton Bridge Works for the superstructure of the Creighton road bridge.

NEWMARKET, ONT.—Wm. Cane & Sons, of this town, have received the contract for the interior finish of the new Ontario Ladies College at Whitby.

PETERBORO', ONT.—The Council have awarded the contract for 1,210 feet of sewer extension to Thos. Rutherford and James Bogue, local contractors.

TRURO, N. S.—Tenders were received for laying asphalt sidewalks from John C. McFatridge, of Halifax; George B. Churchill, of Yarmouth, and McDonald & Co., of Westville, the former being accepted.

LONDON, ONT. - Moore & Henry, architects, have let contracts as follows for the electric street railway power house: masonry and brickwork, Ed. Martyn; structural iron work, Hamilton Bridge

TORONTO, ONT.—The contract for the erection of the addition to the Loz'er bicycle factory at Toronto Junction has been let to A. J. Brown, of this city, for \$10,500. The building will be of brick, three-stories, 50 × 150 feet.

MONTREAL, QUE.—A. J. Cooke, architect, has awarded contracts for a cottage at Chateauguay, P. Q., for W. G. Ross as follows: stone and brick, Jos. Brunet: carpenter and joiners work, M. Desautels; painting and glazing, M. Desautels.

painting and glazing, M. Desautels.

WINNIPEG, MAN.—The tenders received by the Board of Works for a steam road roller were as follows: R. E. H. Gardner-Buckner, representing Aveling & Porter, of Rochester, Kent, Eng., single roller for \$3,450, double for \$3,900; Kelly Bros., of the Enterprise Manufacturing Co., Columbia, Ohio, single roller, \$3,785; Waterous Engine Co., Buffalo pit steam roller, \$4,390. The tender of Mr. Buchner has been accepted. has been accepted.

CORNWALL, ONT.—Tenders for building a granolithic sidewalk on Pitt street were received by the Council as follows: G. W. Read, Montreal, 34 cents per square conto on the Council's specification or 26 cents per square foot on his own specifications; John McBean, Toronto, 26 cents; Clark & Connolly, Toronto, 24 cents; W. J. Wood, Cornwall, 25½ cents. The tender of Mr. McBean has been accepted.

NEW COMPANIES.

St. Faustien, Que.—Northern Lumber Co., applying for incorporation; capital \$20,000; applicants, Jos. Delorimier, E. H. Godin and others.

WOODSTOCK, ONT.—The Woodstock Wagon and Manufacturing Co., seeking incorporation; capital \$25,000.

BROCKVILLE, ONT .- Brockville Electric Railway Co., seeking incorporation; capital \$200,000; promoters, W. H. Comstock, C. S. Cossitt, D. S. Booth, O. K. Fraser and others.

BELLEVILLE, ONT .- Walker Foundry Co., incorporated; capital stock \$20,000; to carry on the business of iron and brass founders, machinists, boiler makers, bridge builders, manufacturers of agricultural implements, etc.

WALLACEBURG, ONT.—Cashmer Mfg. Co., applying for incorporation; capital stock \$20,000; to manufacture staves, hoops and lumber.

TORONTO, ONT.—Canonto Mica and Mineral Mining Co., applying for inincorporation; capital stock \$22,000; to mine, cut and dress mica, etc.—Standard Woodenware Co., Toronto, applying for incorporation; capital stock \$25,000; to manufacture woodenware, furniture, interior art woodwork, architectural wood terior art woodwork, architectural wood carving, etc.

ST. CATHARINES, ONT.—Power Rope & Belting Co., seeking incorporation; capital \$20,000.

R. J. Doyle has established a factory at Shallow Lake, Ont., for the purpose of making ornamental bricks.

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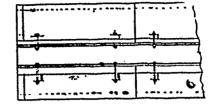
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THE PROPORTIONS OF THE GREAT

PYRAMID. THE conclusion has been drawn from the angle of slope of the casing stones discovered by Colonel Vyse that the builders of the Pyramid were acquainted with the ratio of the circumference of a circle to its diameter, a piece of knowledge they were desirous to embody in its dimensions. In fact, the slope of the original faces of the Pyramid comes out from Vyse's (or Perring's) measurement of the linear dimensions of these stones, 51° 52' 151/2", and by Brettel's measurement of their angle, 51° 50', the mean of which differs only by a single second from the angle whose contangent is the length of an arc of 45° of the circle, so as to make the whole periphery of the base all but mathematically equal to the circumference of a circle described with the height for a radius. So stated, the coincidence is certainly very striking. It by no means follows, however, that the ancient Egyptians were in possession of any calculus by which they could have arrived at a theoretical knowledge of the true ratio. It should be observed that the linear measures above mentioned are given only to entire inches, and those inches of a scale which may or may not have been verified with extreme precision, and therefore can lay no claim to minute accuracy. Computing, moreover, on these measures alone, the ratio of the periphery to the height comes out 6.2784, while that resulting from the direct measure of the angle is 6.2878, the true ratio being 6.2832. The individual results differ by 1-640th part of the whole quantity, and as we do not know with what instruments or what precautions the angle was measured, and it is given only to the nearest minute, it seems but reasonable to admit an equal proportional latitude of uncertainity in the original workmanship and in the nu-merical relation to which it was intended to conform. Now this is a very considerable approximation, much better than that of Archimedes a thousand years later. Still it would be easy for people in possession of such appliances as they must have had at command to ascertain ratio in question to this or even to a greater degree of precision, by tracing, for instance, on a flat pavement a circle of 100 feet in diameter, and actually measuring the circumference. This they certainly might have done to the nearest ½-foot, which, on a length of 314 feet, would correspond to such a latitude of error. If aware of the importance of the problem, they might have gone much further. But, again, it by no means follows from anything which the dimensions of the Pyramid indicate, that they did possess a knowledge of the ratio of the circumference of a circle to its diameter, even approximately. By a very remarkable coincidence, which Taylor has the merit of having pointed out, the same slope, or of having pointed out, the same slope, or one practically undistinguishable from it (51° 49′ 46″), belongs to a pyramid characterized by the property of having each of its faces equal to the square described upon its height. This is the characteristic relation which, Herodotus distinctly tells us, it was the intention of its builders that it should embody, and which we know now that it did embody, in a manner quite as creditable to their workmanship as the solution of such a problem was to their geometry. There is another, and a remarkable relation, viz., that the height of the Pyramid, including the casheight of the Pyramid, including the cas-

ing, and measured from base to apex, supposed to terminate in a point, is one supposed to terminate in a point, is one two hundred and seventy thousandth part (1-270,000th) of the earth's circumference. Taking the equatorial circumference as unity, the error of this aliquot is one part in 736, but if the polar, only one in 3,506, the former error being in defect, the latter in excess, so that there exists somewhere or other on the globe a diametrical section whose circumference diametrical section whose circumference is exactly 270,000 times the original height of the building. Though not a meridiant it is not very remote from one.

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Municipalities issuing debentures, no matter for what purpose, will find a ready purchaser by applying to G. A. STIMSON, 9 Toronto Street, Toronto. Any assistance required in computing calculations in onnection with sinking fund, etc., will be gladly given. N.B.-Money to loan at lowest rates on first mortgage.

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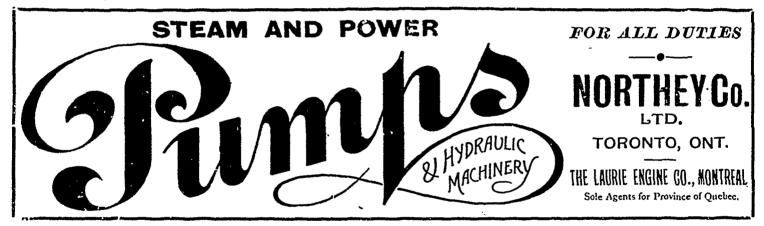
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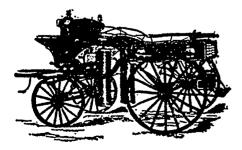
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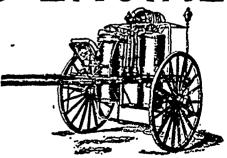


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MUNICIPAL DEPARTMENT

SEWERS AND SEWAGE DISPOSAL.*

One of the essential general questions which city officials are called upon to decide is the character of the system in respect to the admission or exclusion of rain-water. In early times the principal reason for building sewers was to remove the rain water from the streets and yards, and even now this is frequently the case; yet, owing to the general advancement of sanitary science, the necessity for the prompt removal of foul water is becoming equalfy apparent. In England, the mother country of public sanitation, we find the earliest examples of modern sewerage represented in its different systems,-the "combined" system, where both sewage and rain-water require underground removal, and the "separate" system, where the foul water alone requires it, and where rain-water can be left to flow away in natural channels or in less expensive artificial ones.

From a sanitary standpoint no difference between these two systems has been found. Theorists have endeavored to manufacture opinion in favor of the "separate" system in this respect, but statisticians have not sustained them. The cleanest and least odorous sewers at the present day, so far as my own observation goes, are found in the "combined" system as built in some of the European cities:

Time has demonstrated, in England and elsewhere, that choice between the two systems must be based on the questions of convenience and cost.

The 'separate' system is not necessarily cheaper or simpler. When all rainwater must also be removed underground, the expense is usually greater and the double system then required is more complicated than the "combined" system. The reason why the latter is used more in Europe than here is that it is desired to promptly remove the rain-water from the streets.

In America the application of the "separate" system is more extended for two reasons: one is that our rainfall is more intense than in Europe, and therefore a "combined" system is rather expensive for a small community; the other is that in many small towns sewage removal is more imperative than underground rain-water removal.

The difference between the two systems is not a radical one, as the proportion of rain-water admitted to the sewers varies. We'have cases where about one-half the entire quantity, and others where only roof and yard water, or where roof water alone, wholly or partly, is allowed to enter for flushing purposes. Finally, we have a complete exclusion of all rain-water,

where, either on account of pumping or purification works, the admission of any would materially increase the expense. The most extensive interest of this kind is found in the North Metropolitan sewerage system of Boston and vicinity.

Memphis, Tenn., was the first large city in which complete exclusion was adopted, in a system built and patented by Col. George E. Wating, Jr. In extending the system to the suburb Chelsea, the local authorities adopted the regular separate system, based upon principles laid down by English Engineers.*

The Shone system, as built in the World's Fair grounds at Chicago, likewise excluded all rain-water. The peculiar feature of this system, however, is the lifting of the sewage by compressed air at frequent points by so-called ejectors, whereby, under certain conditions, special advantages are obtained.

New Orleans is now constructing the regular separate system according to a design made jointly by Mr. George G. Earl, as chief engineer of the work, and the writer, as consulting engineer, in which a small amount of rain-water may be admitted when desired for flushing.

The selection of the particular system and the proportion of rain-water to be admitted depend therefore on local and economical, but not on sanitary requirements, and the selection should be carefully made by a competent engineer. Not only do different localities require different treatment, but in the same city or town we may have several systems working together. The upper blocks of a sewerage area necessarily exclude the street water. In a valley we may have the "combined" system and on a ridge the "separate" system. Again, an intercepting sewer may carry away the ordinary flow of sewage to a suitable place for treatment, while the storm water and dilu'ed sewage may run into a stream.

It is therefore evident that care should be taken to adopt the best designs and contrivances for each particular case, irrespective of opinions advanced by the promoters of patents. Further, general plans for a complete system should be made early in the life of the city, so as to prevent inconsistencies and unnecessary expense later. The execution of the work and its adaption to special requirements should keep pace with the growth of the city.

In conclusion, a few words may be said regarding the final disposal of sewage. When it can be accomplished safely by a direct discharge into a large river or the sea, this will generally be the most satisfactory mode, as, for instance, in New York, Boston, Philadelphia, New Orleans, and many other cities. When the sewage must be purified before it is discharged, we must then decide what method should be employed.

The purification can be made partial or complete, according to the requirements of the case. Complete purification can be obtained by intermittent filteration through sand of proper grain and depth.

We have a number of cases where this method has been successfully employed for some time in England, France, and Germany, and we have lately commenced to use it in America. Through the excellent work undertaken by the Massachusetts State Board of Health we have been placed in a position to design such works more intelligently and to better effect. They have ascertained the fundamental elements affecting the questions to be considered, and have given us data showing, for instance, that sand is better than soil; that the size of the grains and the quantity of sewage periodically applied stand in a definite relation to the degree of purification. We know better than before what effect a constant use of the same filter has upon its usefulness, and what means are necessary to make it permanently effective in winter and summer and from year to year. From the best filtering areas, both in Europe and America, we obtain thoroughly purified sewage, - purer than some waters furnished for domestic consumption.

There are many instances where clean sand, the most suitable material for purification, cannot be had in sufficient quantities, and then we must be content to partially purify, or merely clarify, the sewage. This is done by mixing with it certain chemicals, notably lime, salts of iron, or alumina, by which the suspended and some of the dissolved organic matters are precipitated, leaving a clear liquid to run off. But these methods still leave about one-half of the organic matter therein. Many such cases of chemical purification are found in Europe, and in our country we can name Worcester, Mass., and the World's Fair at Chicago as the best instances.

What system of disposal to select, particularly when a sufficient quantity of the proper sand cannot be had, is often a difficult question. The expense of precipitation is often a serious objection to its use, and the cost of a long outfall sewer to some large water course, where a discharge is permitted without purification works, may also be great. But, whatever may be the expense, a proper solution should be found, and it may be well to consider that the time is certainly approaching here, and has already arrived in some European countries, when sewage must be purified before it is discharged into a stream. Therefore no plans for a sewerage system should be adopted without due consideration of a suture, as well as a present, proper disposal of the sewage.

An International Sanitary Exhibition was opened at Paris on June 1, and will continue until September 15. It is being held in the Palais des Arts Liberaux, Champ de Mars. Among the ten divisions of the exhibition are the hygiene of dwelling-houses, municipal hygiene, industrial and professional sanitation and demography, and sanitary statistics. One reason for holding an exhibit of this sort just at this time is said to be the fact that the whole sanitary diamage of the city of Paris is to be remodelled during the next three years, which makes it desirable to give engineers, architects and others interested an opportunity to see the modern sanitary appliances of other countries.

^{*}Abstract from an article by Rudolph Hering in the Engineering Magazine.

^{*}Biennial report of the Taxing District (Memphis), Shelby County, Tennessee, January 1, 1889.

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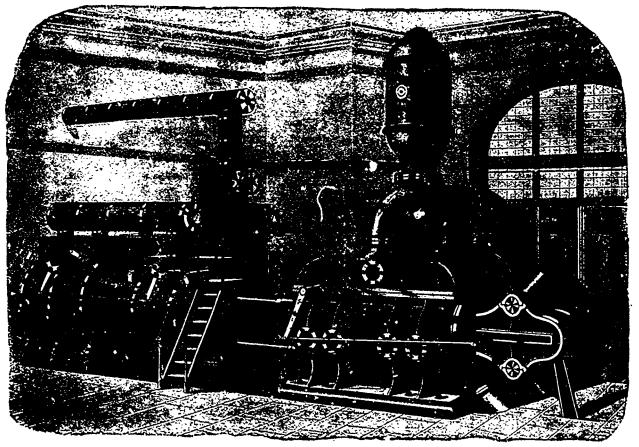
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MONTREAL: A good movement is reported in heavy metals, and prices continue firm. The arrivals of cement last week were 1.300 barrels English and 6,400 barrels Belgian, and the sale is announced of 1,000 barrels English, on western account, at \$1.95, and 2,000 barrels Belgian on local account, at \$1.85. Firebricks are moving freely, and several good sales have taken place.

LUMBER.

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r better r x 10 and 12 mill run r x 10 and 12 dressing	16 00	17 00 22 00		19 00 18 00
T X 10 and 12 common	13 00	14 00	8 00	10 00
Spruce culls	900	10 00	8 00	10 00 9 00
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t inch siding, mill run	14 00	15 00	15 00	16 ∞
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1 1/2 in flooring, dressed, I 1 1/4 inch flooring, rough, I 1 1/4 in dressed, I 1 1/4 in undressed, I	M.26 00	30 00	28 00	31 00
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Beaded sheeting, dressed Clapboarding, dressed		35 ∞ 12 ∞	8 00	35 ∞ 12 ∞
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Cedar	30 00	2 90 40 00	30 00	2 90 40 00
White	28 00	45 00 30 00	35 00 18 00	55 % 20 %
Cherry, No. 1 and 2 White 2sh, No. 1 and 2	70 00	90 ∞	70 00	8000
Elack Ash, No. 1 and 2	20 00	35 00 30 00	30 00 18 00	35 °0 30 °0
Picks, American inspection	16 00 m.,	22 00 30 00	16 ∞	22 0 ₀ 40 0 ₀
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per superficial yard 1 50 2 00 2 15 Credit Valley Grey Dimen-	3d, "" 370 360
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per cubic foot, f.o.b 1 15 1 00 Brown Free Stone, Wood- point, Sackville, N.B., per	2½ 10 2½ """ 3 20 3 10 2 to 2½ """ 3 25 3 25
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