

construction of the factories will be commenced as soon as a suitable site can be secured.—Mr. Luther Anderson, of Lowther ave., has under consideration the erection of a new residence on the site of his present one.—The Toronto and Richmond Hill Railway Company and the Junction Electric Railway Company intend to erect a large building on Bathurst street, near the O. & Q. railway crossing, to be used as a waiting room and ticket office.—The City Council will be asked to provide the sum of \$1,000 for putting a new floor in the pavilion in the Horticultural Gardens.—Building permits have been granted as follows: Andrew Nelson, 406 Manning ave., pair 2 d. 2 story and attic bk. dwellings, w. s. Spadina ave., opp. Castle ave., \$9,000; Victoria Curling Club, one story bk. curling shed, e. s. Huron st., north of Russell, cost \$4,000; James C. Mitchell, 558 Manning ave., pair attached 3 story bk. stores and dwellings, n. e. cor. Queen st. and Brooklin ave., cost \$12,000.

FIRES.

Messrs. Woodcock & Ramsden's saw mill and planing factory at Mount Albert, Ont., were destroyed by fire last week. The loss is about \$4,000; insurance, \$2,000.—Mr. John Johnston's residence at Rodgerville, Ont., was burned to the ground recently. The loss is heavy, as there was no insurance.—A brick block at Halifax, N. S., owned by Murdock Bros. and occupied by Anderson & Co., grocers, H. H. Harrison & Co., painters and paperhangers, and the Nova Scotia Furnishing Company, was destroyed by fire on the 11th inst. The buildings were insured for \$7,000.—Brossoneault, Martel & Bastien's 4th and door factory at the corner of William and Ottawa streets, Montreal, was completely destroyed by fire on Saturday last. The loss will be about \$5,000.

CONTRACTS AWARDED.

COLLINGWOOD, ONT.—Mr. R. Burdett has been awarded the contract for the erection of a new court house and gaol at Sudbury.

TILBURY CENTRE, ONT.—James McDonald, of Blenheim, has been awarded the contract for the erection of the new Methodist parsonage, for the sum of \$1,585.

HARRISON, ONT.—Geo. Gray, architect, has awarded the contract for the erection of a large brick creamery room, with stone basement, for the Harriston Butter and Cheese Co.

WOODSTOCK, ONT.—The Court House Committee has awarded the contract for the combination fittings for electricity and gas to Messrs. Keith & Fitzsimmons, of Toronto, at the price of \$1,500.

OTTAWA, ONT.—The contract for repairing the Government steamer Newfield has been awarded to Mr. S. M. Brookfield of Halifax, the contract price being in the neighborhood of \$16,000.

MONTREAL JUNCTION, QUE.—Jas. Amess, architect, has awarded the contract for a pair of houses for Messrs. Armstrong & Cook, to John A. Lambert, also the contract for erecting the new Methodist church to R. J. Boyd.

TORONTO JUNCTION, ONT.—The tender of D. D. Christie has been accepted by the Council for the supply of 100 ton of stone, at the price of \$8 per ton.—Messrs. G. & J. Brown, of Belleville have been given the contract for building a foot bridge over the C. P. R. yards, to cost \$5,263.

MORRISBURG, ONT.—The contract for the lock masonry on the Rapid de Plate Canal has been awarded to Messrs. Garson, Purser & Co., of St. Catharines, Ont., the amount of the contract being \$180,000. This firm are now engaged getting out the stone from their extensive quarries at Mille Roches, Ont.

WINNIPEG, MAN.—The contract for the erection of the new rink for the Granite Curling Club has been awarded to Messrs. Brydon & Matheson. Work will be commenced at once.—Mr. F. W. Lee has been awarded contracts for the construction of sewers on Main street and 9th street, at the tender of \$840 and \$665 respectively.

AMHERST, N. S.—Messrs. Rhodes, Curry & Co. have been awarded the contract for building the new post office in Dartmouth. They are also about commencing work on a \$20,000 residence for Prof. Bell, to be erected at Baddeck.

The Dartmouth post office will be of brick with stone trimmings. Prof. Bell's house is to be a magnificent wooden structure of ancient Grecian architecture.

BROCKVILLE, ONT.—The contract for the erection of the isolation hospital has been awarded to Mr. Geo. S. Young.—Messrs. Garson, Purser & Co., of St. Catharines, have secured the contract for the erection of the new asylum buildings. Their tender was \$242,000. The general average of tenders, of which there were over twenty, was \$275,000. The work will proceed at once. The contract for heating has not yet been awarded.

MONTREAL, QUE.—The following tenders have been accepted for the erection of the Verdun Insane asylum: Masonry, Hoffman V. Fraser \$5,805; brickwork, Hoffman V. Fraser \$12,455; carpenter work, James Shearer, \$10,925; heating, Smead Dowd, \$3,480; closets, Smead Dowd, \$500; plastering, Thomas Phillips, \$3,132; plumbing, R. Mitchell, \$1,190; painting, George Glenn, \$655; roofing, Montreal Roofing Co. \$1,419; iron work, Dominion Bridge Co., \$810; Messrs. Wright & Son, are the architects.—G. Mann, architect, has let contracts as follows: for 2 stores and dwellings on St. Dennis street, for O. Rober.—Masonry, J. Leonard, carpenter work, Bastien & Provost, for 3 houses same street for Mrs. Guerd, masonry, Huot & Son; other trades not let, eight houses on Charlevoix st., to be built of wood and Don Valley pressed brick, masonry, J. Grenier; carpenter work, Mr. Metivier.

TORONTO, ONT.—The tender of Messrs. Baumhard & Geddes has been accepted for work on the new rifle range. The figures are as follows: caretaker's cottage, \$1,067; general offices, \$1,604; shelter buildings, \$2,031; digging and bricking well, \$50; total, \$4,752.—The Board of Works has awarded the following additional paving contracts in connection with the street railway: cedar block with granite tooth-ing, Queen street east from G. T. R. crossing to Leslie street, D. L. Van Vlack, \$1,748; Queen street from Leslie street to Eastern avenue, Clark & Connelly, \$15,087; Queen street from Eastern avenue, Chas. Farquhar, \$16,720; Queen street west from High Park avenue to Roncesvalles avenue, Chas. Farquhar, \$11,865; Asphalt on concrete, with granite tooth-ing, Avenue road, from Bloor street to north city limit, Toronto Construction and Paving Company, \$24,999; Concrete on track allowance, Gerard street from Rivier street to Pape avenue, W. H. Cathro, \$16,833.

ANALYSIS AND TESTS OF DRAWING PAPER.

The multiplicity of materials used by paper manufacturers has rendered the testing and analysis of this product a difficult operation, and one which necessitates the use of really scientific methods.

The following is, according to the *Revue de chimie industrielle*, the method by which the tests are carried out at Charlottenburg. The operations relate to the following points:—

- Tenacity and elasticity.
- Resistance to rubbing.
- Thickness.
- Nature of the size employed.
- Ashes.
- Nature of the materials composing the stock.
- Presence of chlorine or free acid.

The analysis includes mechanical processes, chemical essay and especially microscopic examinations. To determine the tenacity, a certain number of strips, taken in different senses, are tried on a special machine, called the Gartyg-Reisch; the mean of the results is taken and the tenacity is expressed in terms of the length of the strips essayed, whereat they break; this figure is easily deduced when the weight of the paper and the coefficient of tension are known.

The Gartyg-Reisch machine gives also the degree of elasticity of the paper.

For the resistance to rubbing, a sample is simply rubbed between the hands during a given time; the number of operations necessary to obtain complete disaggrega-

tion is proportional to the quality of the paper.

The thickness is determined very exactly by means of an instrument provided with a micrometer screw.

The nature of the size is determined by means of chemical reagents: a sample of the paper is boiled in water and a solution of tannin is poured into the decoction; if gelatine (animal glue) be present, a precipitate shows itself, or the liquid becomes at least turbid. To liberate vegetable glue, a decoction is made of the paper in alcohol; when this decoction is poured into cold water, the resin is precipitated.

The amount of the size in the paper is estimated by the following ingenious method; several lines are traced on one side of the paper with an aqueous solution of perchloride of iron, and the paper is then laid on a solution of tannin with the unwritten side downwards; the time which elapses between the placing of the paper in the bath and the blackening of the lines is proportional to the amount of size.

Commercial cellulose does not leave one per cent. of ashes; if the paper leaves a greater proportion, it proves that mineral substances have been employed, and the percentage of them is easily determined.

The presence of chlorine is easily detected by means of starch, saturated with iodine of potassium; this latter then takes a bluish hue.

The detection of free acids is a very delicate operation, and is preferably performed by the Gertzberg process, by means of a sensitive red.

In good papers, however, it is rare that traces of either chlorine or free acids are discovered.

The microscopical tests are often very useful; a small piece of the paper is placed on the stage of the instrument, and a drop of a solution of iodine poured upon it; if the paper is made from wood pulp, the fibres will turn yellow; if flax, hemp or cotton alone form the stock of the paper, the coloration of the fibres will be brownish yellow, and if the paper be made of pure cellulose, the iodine will in no way affect the color of the fibres.

It is better, for the microscopical examination, after having damped the paper with the iodine solution, to boil it in a porcelain capsule with a few drops of alkaline solution; if the paper is sized, the solution will become, after two or three minutes, of a yellowish tint. After a quarter of an hour's boiling, the paper pulp is washed in water, then held in fresh water to be examined with the microscope.

The appearance of the different vegetable fibres is not the same in the pulp of the paper that it is at the beginning of the process of manufacture; the determining of the materials composing the stock is therefore difficult and can only be done by an expert. The *Bulletin de la Societe d'encouragement pour l'industrie nationale* published some time ago a series of drawings which singularly facilitate the determination of the fibres.

It is well known that the average quality of paper made in Germany has sensibly improved of late years, and there is no reason to doubt that this result is in a great measure due to the influence of these scientific analyses and tests.—*Revue Scientifique*.

A CHANCE FOR A CONTRACTOR.

A Chicago correspondent writes to the *CONTRACT RECORD* as follows: "Enclosed is one of my contracts for \$150,000, and if you know of any person in the contracting line who can command \$15,000 or \$20,000 cash, send him to me and I will guarantee to give him this contract, make for him over \$10,000 profit. Persons who may be desirous of further information may obtain it at this office."

TORONTO ARCHITECTURAL CLUB.

The first regular meeting of the above club for the season of 1892-93 will be held on Monday evening next, at which Mr. C. H. Acton Bond will give a paper on "The Interior of a House," and the drawings for the late examinations will be on exhibition.

MUNICIPAL DEPARTMENT.

ELECTRICAL PURIFICATION OF SEWAGE.

Dr. C. A. Burghardt recently read before an English engineering society a paper on sewage and its purification. Among other processes is mentioned an electrical process. Iron is the active agent and is derived from iron plates placed in cells through which the sewage constantly flows. One set of cells is positive and the other negative. Only the positive plate is acted upon and dissolved upon its surface, hydrated ferrous oxide being produced by the action of the nascent oxygen (liberated by the decomposition of the water at this pole) acting upon the metallic iron. This hydrated ferrous oxide (which is in solution) then acts upon the organic matter, becoming, first, hydrated ferric oxide by absorption of oxygen from the air, giving up this oxygen again to the organic matter and becoming the lower oxide, and repeating this operation for a considerable time until the carbonaceous matters which are oxidizable have been oxidized, when no further reduction of the ferric hydrate can take place and it remains insoluble and suspended in the effluent, as a yellowish precipitate. In order to cause the plates to wear off or dissolve equally, the poles are reversed on alternate days, a plate being positive one day and negative on another day.

The electrical process has been submitted to a thorough trial at Weaste from October, 1891, to March, 1892, on a specified quantity of 4,167 gallons per hour, or 100,000 gallons per 24 hour. The current density employed was one ampere for every seven square feet of electrode surface, or 0.4 ampere hour per gallon of treated sewerage. The electric shoots or channels were constructed in four lengths—the smallest number which would be adopted in practice. Each of the four shoots is divided into 34 cells, each cell containing 16 iron plates each two feet by one foot six inches by one-half inch. The total weight of iron plates employed in this trial was about 55 tons. The plates were connected all parallel in each cell, the cells in each shoot connected in series and the four shoot parallel. The electrical energy employed was 50 amperes at a pressure of 50 volts, or a little over four induced horse-power. Each of the shoots was connected by conductors with a distribution board and suitable switches in the engine house, in order to enable the operator to reverse the current of any one shoot if desirable. This reversal of the current was carried out upon one shoot at a time, the other three shoots taking temporarily the whole flow of the sewage. The poles of the shoot in question being reversed, the cells in that shoot were short-circuited, which at once caused a very rapid discharge of the back current. After this had taken place the current was reapplied in the opposite direction through a resistance coil, and the resistance gradually cut out as the normal electrical conditions were established. The treated sewage then flows into ten settling tanks (two sets of five), each tank being eight feet wide, 16 feet long, and about 5 feet deep. The sewage flowed continuously through one or other of