

pumping station, new foundations for engine, repairing of reservoirs, and the thorough overhauling of the old engine and boilers.—The Militia Department has selected Fletcher's field as the site for the proposed new military school, which it is estimated will cost about \$150,000.—A. Davis, Superintendent of Waterworks will receive tenders until noon of the 21st inst. for the supply of water meters for the Montreal waterworks.—The City Council has given notice of its intention to construct a sewer on Metcalfe street.

TORONTO, ONT.—John Galt, C. E., has prepared plans for a masonry dam and small steel bridge at Mount Pleasant cemetery. St. Andrew's church at Centre Island, is to be enlarged. A. R. Denison, architect, will have charge of the work.—We learn from the City Engineer that the disputed points in connection with the York street bridge have been satisfactorily arranged, and that work will in all probability be commenced this fall. It has been decided to construct the pillars of steel.—The City Engineer has completed the plans for the widening of the Queen street subway, and Mr. E. J. Lennox is preparing an estimate of the cost of altering the buildings abutting on the proposed widened roadway. The by-law authorizing the expenditure will be submitted to the ratepayers at an early date.—Wm. Harty, Commissioner of Public Works, will receive tenders until Monday the 27th inst. for the erection of a court room and gaol at Mattawa, Nipissing district. Plans may be seen at the town hall, Mattawa, and at the above department in this city.—Building permits have been granted as follows: Rev. J. A. Dowler, 14 Bernard ave., improvements to cottage, cost \$1,000; Jos. Simpson, 140 St. George st., 3 story brick addition to No. 6 and 8 Berkeley st., cost \$1,800; L. Sievert, 12 Terauley st., 2 story bk. add. and alterations to 14 Terauley st., cost \$1,500.—The Sheppard Publishing Company have purchased a lot on the north side of Adelaide street west and will erect a building thereon.—It is reported that the Grand Trunk Railway Co. will shortly convert the belt line of railway into an electric road.

FIRES.

W. C. Harrison's planing mill at Norwood, Ont., valued at \$9,000, was completely consumed by fire last week. Insurance, \$3,000.—J. G. Grant's grist mill at Windsor, Ont., has been destroyed by fire. Loss, \$6,000; insurance, \$4,000.—A large planing mill at Port Arthur, Ont., owned by James Connee, was totally consumed by fire on the 13th inst. The loss will be about \$18,000 and the insurance \$10,000. The electric light plant situated in the mill was also destroyed.—A grain elevator at Forest, Ont., owned by the Forest Elevator and Milling Co., was burned on the 10th inst. Loss on building, \$1,700. Mrs. Terbinen's residence at St. Boniface, Man., was burned a few days ago. Loss \$3,500; insurance \$1,000.—Fire at Belleville, Ont., on the 14th inst., destroyed the stores of Charles Clark, C. B. Scantlebury and John Grant. The loss is partially covered by insurance.—A large brick building at Berlin, Ont., owned by Ephraim Bricker, has been destroyed by fire. Loss, \$5,000, partially covered by insurance.—John Sutherland's store at Sheet Harbor, N. S., was burned on the 15th inst. Loss, \$5,000, no insurance.

CONTRACTS AWARDED.

ANDERDON, ONT.—James Wilderspin has been given the contract for a new residence and school house for Father Marseille, to cost about \$5,000.

GUELPH, ONT.—The Guelph Light and Power Co. have been awarded the contract for wiring the new opera house block now in course of construction in that city.

BROOKFIELD, N. S.—Messrs. Schurman, Clark & Co., Summerside, have secured the contract for building the Presbyterian church here. Contract price, \$2,415.

LONDON, ONT.—Contracts for improvements to King street Presbyterian church have been let as follows: brickwork, Simpson & Murray; carpenter work, W. Tyler; estimated cost \$3,000.

HAMILTON, ONT.—The following tenders have been accepted by the Hospital Committee for the new House of Refuge: masonry, J. G. Habner, \$5,138; carpentering, James Jacques, \$5,850; plastering, F. C. Thomas, \$873; painting, John Goodfellow, \$442; plumbing, Fairley & Stewart \$707; steam heating, A. Clark, \$1,900; electric lighting, Lowe & Farrell, \$215; slating, Findlay & Son, \$1,147; galvanized iron work, Wallace & Son, \$689; total \$16,961.

MONTREAL, QUE.—Mr. A. Prefontaine architect, has awarded contracts for buildings covering the cemetery grounds at Notre Dame de Grace for the sisters of the congregation as follows: masonry and excavation, O. Martineau; carpenter and joiners' work, Chas. Prefontaine; roofing, Blouin, Desforges and Latourrelle.—Mr. W. McLea Walbank, architect, has awarded the contract for the erection of a summer residence at Dorval, Que., for E. K. Greene, to T. H. Demers. Also for alterations to residence on Sherbrooke st. for S. Davis as follows: masonry, Whighton & Morrison; brickwork, W. H. Boon.

WHAT BUILDINGS COST PER CUBIC FOOT.

AN interesting article is contributed to the American Architect by F. E. Kidder. With materials and labor at the same price, says the writer, two buildings of the same character, although of different sizes, will be found to cost approximately the same per cubic foot; hence the cost of a proposed building may be quite closely estimated by multiplying its cubic contents by the known cost per cubic foot of a similar structure built in the same locality. Any general change in the price of materials and labor would, of course affect the cost per cubic foot in the same ratio.

In some cases, says Mr. Kidder, the reluctance of owners to have the actual cost known, makes it necessary to estimate it, but, through the courtesy of leading architects, he believes he has been able to state the cost very closely to what it really was.

In most cases the architect's fee was not included. It will be seen from the figures given, says the writer, that the cost of business blocks of the same character, in the same locality, and built at the same time, varies but little, the most variation in any class of buildings being in the cost of dwellings.

The cost of the Chamber of Commerce in Boston is given as twenty-nine cents per cubic foot. The cubical contents above the basement floor to the base of the conical tower is 1,311,000 feet. It was built in 1891-'92.

The New England Life Insurance building, on Postoffice square, built after the great fire in Boston, is said to have cost 60 cents per cubic foot. The Hemenway building, on the corner of Fremont and Court streets, constructed of pressed bricks, is reported to have cost 45 cents per cubic foot.

The Auditorium building in Chicago, erected in 1887, with a cubical contents of 9,128,744 feet, cost 36 cents, the stock exchange, in the same city, cost 32.2 cents, and the Schiller building, sometimes called the German theatre, built in 1891, cost 30.8 cents per cubic foot.

The new building of the New York Herald, erected last year, is said to have cost Mr. Bennett 46 cents per cubic foot, and office buildings in the same city have cost from 24 to 60 cents per foot, according to material and finish. George B. Post, architect of many of the tall office buildings in New York city, writes: "I can only state in general that, varying with the market rate of materials and labor, large office buildings which I have erected have cost from 30 to 45 cents per cubic foot, including all excavations."

Two Denver club buildings, those of the Athletic Club and the Denver Club,

are mentioned, the former, with all equipments, costing 18 cents, and the latter 24 cents per cubic foot.

A fire proof hospital in New York, including plumbing, heating apparatus, machinery, etc., is quoted at 40 cents, and another, nearly fire-proof, at 32 cents.

A modern church in Cambridgeport—the Grace Methodist Episcopal—built in 1886-7, cost 8 3/4 cents, and the Christ Methodist Episcopal Church, Denver, a stone building with tower, cost 20 cents per cubic foot. A fourteen-storey fire proof hotel in New York, cost 44 cents, and the Brown Palace Hotel at Denver 30 cents per cubic foot.

City dwellings in Chicago, designed by Adler & Sullivan, cost per cubic foot, from 17 to 20 cents. Of dwellings designed by the writer, the average cost of eight and ten-room wooden houses in Boston, in 1886, per cubic foot of habitable space, including cellar, was about 11 cents. In Denver, Col., the cost of a first-class stone house with hardwood finish, steam heat, extra plumbing, decorations, etc., complete, is about 27 cents. Brick houses of 10 rooms, pine finish, furnace heat, good plumbing, etc.,—cost per cubic foot above cellar floor, but not including unoccupied space, about 14 cents. Cheap eight room brick cottages of 1 1/2 or two stories, bath room and furnace, cubic space reckoned from cellar floor, but not including unoccupied roof space, can be built for ten cents.

MUNICIPAL DEPARTMENT.

SANITARY CONVENTION.

At the ninth annual meeting of the Association of Executive Health Officers of Ontario, which is now in session at Chatham, Ont., the following papers on municipal subjects are to be read:—"Municipal Sanitation," by Chas. Sheard, M.D., M.H.O., Toronto; "Sewerage and Disposal of Sewage," by Willis Chipman, C.E., Toronto; "Methods for Dealing with Consumption and other Contagious Diseases," by John Coventry, Windsor; "Public Water Supplies," by Thos. Macfarlane, Esq., Department Inland Revenue, Ottawa; "School Sanitation," by H. Howitt, M.B., M.H.O., Guelph.

CEMENT TESTING.

The brief discussion that took place on Mr. Bamber's paper before the meeting of the Municipal Engineers was conclusive as to the point that the present system of cement testing is unsatisfactory. The members referred especially to the discrepancies between the tests made by themselves and those made by the manufacturers of the cement. The tale as told can be retold in a few words. "I bought cement to a certain specification. I tested the cement supplied, and according to my tests it hardly came up to the specification. Upon writing to the manufacturers they sent an experienced tester, with the result that his results far exceeded those required by the specification. It was easy to see how he obtained his results, and there is no reason why almost any moderate results should not be obtained. He with his tools rammed as much cement into the space as time, patience and strength would admit." Such statements as this cause us to ask what tests and what results are required. It seems there is only one answer, that the tests and results should approximate as closely as possible to those required in practice. If super-excellent results are obtained in a manner which is never carried out under ordinary working conditions, these results are of little value. The ordinary engineer says: "I use cement mixed with sand in certain proportions, and what I want to know is the strength of the compound; or I mix cement up as cement with a shovel, not compressing or confining it except in the natural way and I require to know its strength under these conditions." These arguments are sound and should prevail. The value of cement

is in its strength as used, not in its strength under conditions in which it is never used. Would it not be possible to agree upon a system of testing which should approach more nearly to the requirements of practice than to continue the present system, which entirely depends upon more or less ramming for the results obtained? The cement might be run into a measure under conditions which would prevent any abnormal quantity getting into the measure, and thus a briquette be formed. At any rate, it is evident that some common ground of understanding must ere long be come to, and a better way than a committee of municipal engineers could hardly be found. There are two classes of tests which must not be confused. We may have a series of tests of apparatus or manufactured articles to see how they behave under conditions as perfect as we can make them, and another series of tests with the same apparatus in actual working. The latter results are generally far and away below the former, and the relation between the two shows what we have to work upon to improve the everyday conditions. Engineers can arrange their engine brake trials so that the results can be compared all over the world, and it is known that the arrangement in New Zealand is practically the same as in England, but no two experts can so manipulate their cement briquettes that the results are similar from briquettes made and tested under the same conditions. We doubt if the same expert can make two briquettes alike, hence the test must be so far inaccurate. Those members who discussed the paper seemed to feel, though they did not express their views in words, that the manufacturers' tests ought not to be taken as indicating anything of value, and urged uniformity of practice in testing. Who shall stipulate the test to obtain this uniformity?—Contract Journal.

An ancient roadway has been discovered at Marseilles, Ill. It is from four to six feet below the surface, and is constructed of stone underlaid by pounded sandstone and gravel. Each slab is about twelve feet long, from one to three feet wide, and about two inches thick. It proves that civilization had its hold here long before the advent of the Indians.

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