Industrial School Association, Mimico, held a meeting a few days ago to decide upon a fitting memorial to the late W. H. Howland. A sub-committee was appointed to make arrangements for the erection of a memorial hall, and another meeting will be held shortly to receive their report.

FIRES.

A new double dwelling house at Halifax, N. S., owned jointly by Geo. Grant and J. Stanhope, was destroyed by fire on the 25th inst. Insurance $1,000.—The music hall at Creemore, Ont., was burned recently. The loss is mostly covered by insurance.—The new opera house at Woodstock, Ont., was totally consumed by fire on the 22nd inst. Insurance $10,000. It will in all probability be rebuilt. The building was owned by E. W. Waborn—The flour mill at Tavistock, Ont., of which the Ratz Bros. are the principal stockholders was destroyed by fire last week. Loss, $23,000; insurance, $4,000. —The Rathbun Company's office and freight sheds at Belleville, Ont., were burned on Friday last. Loss, $9,000, covered by insurance. The Bromell House at St. Thomas, Ont., was destroyed by fire recently. Loss, $4,000; insurance, $2,000.—W. A. Benson's residence at Northport, Ont., was burned to the ground on Tuesday last.—The flax mill at St. Thomas, Ont., owned by J. Lindsay and operated by Mr. Keith, was destroyed by fire on the 26th inst. Loss, $4,000; no insurance. It is said the owner will not rebuild.—C. Lacroix's frame dwelling house at Sarnia, Ont., was burned on the 20th inst. Loss, $1,200.—The cheese factory at Cherry Hill, Ont., was burned recently. Loss, $2,500; fully covered by insurance.—Fawcett's foundry at Halifax, N. S., was destroyed by fire on the 24th inst., including the moulding shop, nickel rooms, furnace and engines. The loss will amount to over $75,000.—Edwin R. Wrights buildings on Campbell road, Halifax, N. S., were burned last week. Loss, $4,000; insurance, $1,200.

CONTRACTS AWARDED.

RED DEER, ALTA.—The contract for constructing a traffic bridge across the Red Deer River has been awarded to Mr. D. W. McKenzie, of this place.

OTTAWA, ONT.—Mr. W. A. Currie, of Bank street, has been awarded the contract for painting and glazing for the proposed contagious diseases hospital.

VANCOUVER, B. C.—The contract for the construction of the Sumas dykes has been given to Messrs. McLean Bros., and for the boilers, engines, etc., for the same to the British Columbia Iron Works Co.

HAMILTON, ONT.—It is said that contracts for the erection of the proposed smelting works have been awarded to a large American firm, the contractors agreeing to take half the contract price in stock.

BERLIN, ONT.—The offer of the Ontario Mutual Life Assurance Co., of Waterloo, of $23,300 for the issue of $22,000 of 5% debentures of this town, payable in 30 equal instalments, has been accepted.

TORONTO, ONT. — The Peterboro' Bridge and Engineering Company have finally been awarded the contract by the Board of Works for the supply of steel pipes for the extension of the Yonge st. sewer, at the tender of $7.48 per foot. The Board also awarded contracts as follows on Tuesday last: Severn street sewer, J. H. McKnight & Co., $757; Hill street sewer, and May street sewer, A. J. Brown, $551 and $718.

MONTREAL, QUE.—The governors of Laval University last week awarded contracts as follows for the erection of new University buildings on St. Denis street, near St. Catherine street, in accordance with plans prepared by Messrs. Perrault, Mesnard & Venne, architects: stonework, Boncher & Huberdeau; brick-work, Pl. Brunet; steel and iron-work, Loignon & Frere; wood-work, U. Pauze, plastering, E. Morache; painting and glazing, and plumbing-work, Pelletier & Brosseau; heating apparatus, Lesard & Harris; roofing, Pelletier & Brosseau. The building is to be of Montreal limestone four stories high with basement, and will cost about $150,000. The style of architecture is Renaissance.

BUSINESS NOTES.

G. Smith, plumber, Montreal, has been burned out.

Massey & Dufresne, contractors, Montreal, have dissolved partnership.

Cameron & McKay, masons, Deloraine, Man., have dissolved partnership.

Mr. Joseph Nott is commencing business as a plumber at Vancouver, B. C.

It is announced to be the intention of the E. Chanteloup Co., of Montreal, shortly to go out of business.

The firm of Nelson & Maughan, sash and blind manufacturers, Richmond, Que., has been dissolved, Mr. Maughan retiring.

ELECTRIC DRILLS IN A QUARRY.

The electric percussion drill, since it was first put into practical operation, has undergone many changes, each in the line of improvement, until to-day it competes successfully either with steam or compressed air drill. One of the most interesting percussion drill plants is that in operation at the limestone quarries of the Solvay Process Company, near Syracuse, N. Y. This plant has now been working continuously for several months, and the results attained, both in amount of work done by the drills and the convenience and economy of their operation and maintenance, have given thorough satisfaction to the company first undertaking their general employment. Installed by the General Electric Company of New York at the commencement of last winter, the drills have operated without interruption from the intense cold, and have practically demonstrated the advantages derivable from the use of electricity in quarry work. Had steam been the only available power, conditions were such at this plant that the loss in transmission by condensation at 20 deg. below zero would have been so great that the drills could not have been worked. The quarry is situated in a desolate spot on an elevated plateau, where intense cold found full scope for action. At the present time three "Type E" General Electric Company's drills are in continuous operation for ten hours per day, drilling holes from six to ten feet in depth, and from 2 to 2½ inches in diameter at the top. The rate of drilling according to the record kept by the superintendent, is from 45 to 75 feet per ten hours, averaging 50 feet per day, or 1,500 feet per month of 30 days. The average distance of the drills from the power station is about 2,000 feet at the present time, the circuit, three lines of bare No. 0 copper wire, being extended to a distance of 3,000 to 5,000 feet from the power station in one direction. The manipulation of the drill is in every respect as simple as that of the steam or air drill, stopping and starting being accomplished by merely throwing a handle to the right or to the left, making or breaking the contact between the cable and the terminals of the coils. Not the slightest difficulty is experienced in lubricating the wearing parts or in handling the drill. The general dimensions of the "Type E" drills, three of which are doing all the deep-hole drilling for the quarry are:—Length over all, 49 inches; outside diameter, wrought-iron tube, 7½ inches; blows per minute, 380. The generator which supplies the power is of the bipolar type, running at normal speed, and is provided with a device for directing the current alternately into the upper and lower coils of the drills. The difference of potential at the fixed brushes of the generators is 240 to 250 *v.* The generator is belted to a 9 inch by 12 inch straight line engine, supplied with steam at 90 pounds pressure from a horizontal tubular boiler; fuel for which is brought for three miles over the cableway in the buckets used to transport the lime rock from the quarry to the works. As yet no estimate of costs of repairs can be given because up to date there have not been any. Should, however, any part break down it can instantly be replaced, as all the parts are interchangeable. The company states that the plant has aroused widespread interest among quarry operators in general, and has been visited and carefully inspected by many less prone to reject the good things which advanced science offers. That electricity is an ideal power for mine and quarry operation the working of these electric percussion drills does much to show.

HOW TO FIND THE STRENGTH OF CAST-IRON COLUMNS.

The method of finding the necessary sectional area of metal to support a given load at a certain height is as follows: Let us, says Work, take a case of a column 18 feet high, having to support a load of ten tons. The first point to be decided is what is to be the diameter of the column. Let us, to commence with, assume one 6 inches in diameter. This makes the number of diameters 36, which, by the diagram, we find wants a divisor, of 57.6. This must first be multiplied by the load (10 tons), then divided by 49—i. e., the number of tons required to crush a square inch of cast iron—which gives us 11.75 square inches of sectional area required. Now, to obtain the thickness of metal necessary to give such a column this amount of area requires a somewhat lengthy calculation. We must first deduct this 11.75 square inches sectional area from the area of a 6-inch circle (which is is 28.27), and this gives us 16.52 as the area of the hollow space of which we wish to learn the diameter, viz., the inside diameter of the column. To obtain this, we divide 16.52 by .7854, getting a quotient of 21.03; and we then extract the square root of this amount, which gives us 4.58 inches as the diameter. By deducting this from 6 inches (the outside diameter), we get 1.42 inches as the thickness of the metal on the two sides, or .71 inches as the thickness of the metal required. If 9 inches be taken as the diameter and the same method followed, remembering that the column is 24 diameters, and therefore 33.3 is the divisor, it will be found that only 6.79 inches area are required, and this can be obtained by metal about ¼ inch thick; but in castings, such as columns of this size, nothing less than ½ inch metal should be used, and therefore a diameter of about 7 to 7½ inches would be the best to employ for such a position.

USEFUL HINTS.

A cord of stone, three bushels of lime, and a cubic yard of sand will lay 100 cubic feet of wall.

1,600 laths will cover 70 yards of surface, and eleven pound lath nails will nail them on. Eight bushels of good lime, sixteen bushels of sand, and one bushel of hair will make enough good mortar to plaster 100 square yards.

Cement, 1 bushel, and sand 2 bushels, will cover 3½ square yards 1 inch thick; 4½ square yards ¾ inch thick, and 6¾ square yards 1 inch thick; 1 bushel cement and 1 of sand will cover 2¼ square yards 1 inch thick, 3 square yards ¾ inch thick and 4½ square yards ½ inch thick.

The proportioning of radiation is a detail in the planning of an apparatus for warming, says *Heating and Ventilation*, which calls for careful judgment, and it is important that a full consideration be given to all conditions which would influence this estimate, forming as it does, the basis of computation for the entire work, and particularly for determining that most vital point in any system of warming—the boiler.

A STRONG CEMENT.—Common alum melted in an iron spoon over hot coals forms a very strong cement for joining glass and metal together. It is the best thing for holding glass lamps to their stands or for stopping cracks about their bases, as kerosene does not penetrate it. Housekeepers ought to keep this in remembrance, for sad accidents may be prevented by its use.

MUNICIPAL DEPARTMENT.

BRIDGE SUPERSTRUCTURE AND FOUNDATIONS IN NOVA SCOTIA.

During the last few years the use of concrete for highway bridge abutments and piers has obtained much favor in Nova Scotia, owing largely to the efforts of Mr. Martin Murphey, M. Am. Soc. C. E., Provincial Government Engineer. There have been 147 highway bridges of metal superstructure and concrete foundations built within 10 years, 44 of which have been standing for five years. The use of concrete foundations is also being rapidly extended to railway bridges. These foundations have been subjected to heavy drift ice and to the extreme of climate, and but one failure has been recorded; this one was undoubtedly due to improper workmanship. The work is done under the supervision of the government engineers, and generally by men trained in the use of concrete. The cost of concrete work in bridge piers and abutments varies from $5.50 to $6.50 per cu. yd., and from $7 to $8 in arched bridges. The aggregates used vary according to the material most easily obtained in the neighborhood of the work. They are for the most part the natural gravels. Large rubble stones are commonly used imbedded in the concrete. The cement used is English Portland.

The construction of concrete foundations varies, of course, with the conditions of the foundation bed. On rock, iron or steel cylinders are commonly used. A crib containing voids for the cylinders is sunk over the pier site, and holes are drilled into the rock in which iron rods are placed. The cylinder is then placed outside of these rods and filled with concrete. Where quicksand covers the rock it is first removed and then a mattress of brush and small stones is sunk through which the piles are driven and the cylinder is placed on them. The space between the piles is filled with concrete, and the piles directly under the cylinder are allowed to extend up into the cylinder several feet. Cribwork and piles are also used in clay. In some cases caissons resting on piles, upon which a monolith of concrete is built, without cylinders, are used. It is stated in the paper read before the International Engineering Congress by Mr. Murphy, from which the above matter has been abstracted, that these foundations withstand the action of the climate and the shocks of drift ice better than masonry and that they are much cheaper.

CHEMICAL PRECIPITATION for disposing of 12,000,000 gallons, or one fifth of the sewage of Glasgow, Scotland, is to be tried in a plant designed by G. V. Alsing and erected at a cost of $225,000. On entering the works it runs direct into the catch-basins, according to the *Industries and Iron*, where the heavier parts are precipitated by gravity and flow into sludge tanks. It is then run into filter presses and will be utilized as manure for agricultural purposes, if possible. The lighter flow from the catch-basins will be lifted by centrifugal steam pumps into the mixing chamber where the chemicals, sulphate of alumina and milk of lime, are added. The liquid then passes into the precipitation tanks, 24 in number, each 45'×50'×6' in depth, and with the capacity of 96,000 gallons. The work of separation over, the fluid on the surface is emitted through self-floating valves into a corresponding number of aerating tanks of similar dimensions. The effluent is discharged into Clyde, after filtration in 60 filters covering some three acres of ground.