

STUDENTS' DEPARTMENT.

USEFUL HINTS.

SQUARING UP LINES.—In drawing the lines for a foundation, or stretching them overhead for a shafting, a paper of pins comes in handy, to locate positions on the lines. All that is required is to thrust one through the line every time a point is to be located, and it can be easily done, in a moment, as close to the mark as anyone can work on a drawing board. It may take a few moments to square a set of cross lines on the six, eight and ten principle, when there is to be a ten-foot pole supported by three assistants, reaching out from whatever they may be able to stand upon, as every change in a cross line disturbs all the measurements, but when once adjusted all further lines can be laid out by direct measurements, and the rest of the angles will take care of themselves.

SEASONING WOOD.—Growing wood contains in winter about 50 per cent. of water, in March and April 46 and 48 per cent. in the next three months, with but little variation up to November. Timber dried in the air holds from 20 to 25 per cent. of water; never less than 10 per cent. Wood dried by artificial means until all the moisture is expelled, is deprived of its elasticity, and becomes brittle. If the natural qualities of the wood are to be preserved, the drying must begin at a moderate heat, and be carried on very slowly. For the drying of small pieces of wood, such as are used by joiners or cabinet makers, a bath of dry sand, heated to a temperature not exceeding one hundred degrees, is recommended. The sand diffuses the heat, and absorbs moisture, but it must be cold when the wood is first buried therein.

EFFECT OF HEAT ON LEAD PIPES.—Text-books contain a great deal of useful information, no doubt, but they fail to give a vast amount of knowledge which is required in practice. Where, for example, do we find any mention of the effect of heat on lead pipes? In the case of a recent electric lighting installation, exhaust steam by some means found its way into the ventilating and soil pipes leading to the drains. One of the first evidences of this was found in the warping of all lead pipes so used. It appears that the heat of the exhaust steam caused the lead pipes to expand and warp, but when the steam was entirely prevented from entering the drains the lead would not contract, and all such pipes had to be straightened by hand. This is a point which embryo engineers would do well to keep in mind, as each time the pipes were heated they expanded, but in no case did they show any signs of coming back to their normal condition.—Industries and Iron.

SAND IN MORTAR.

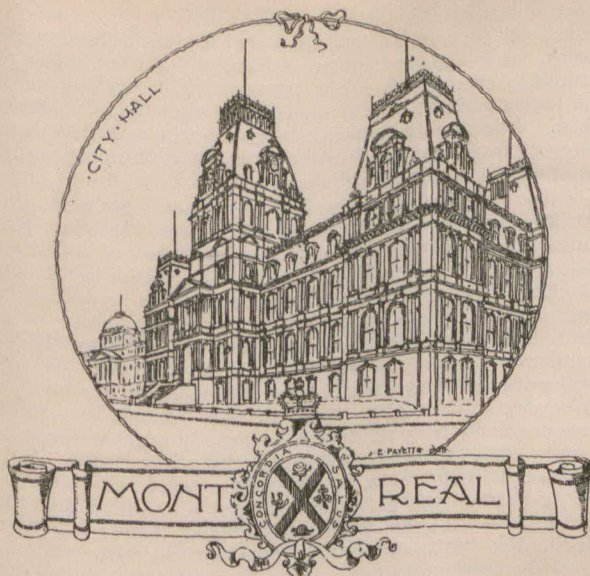
It was the opinion of Vitruvius that pit sands were preferable for mortar, but he says that they must be freshly dug, otherwise they are decomposed by the action of the atmosphere and become earthy, and in this state they make bad mortars. Alberti, Palladio, Phillibert, Delorme, Blondel and some other writers agree in these opinions, but Belidor thinks that river sand is best, and that it should be sharp. Palladio considers that white sands are worst. Belidor states that color has nothing to do with the matter. Rondelet, in consequence of these contradictory opinions, made experiments himself on the subject, with the following results:—(1) That the glassy or quartzose sands form with lime a weaker mortar than mixed sands, and that such mortar is longer drying. (2) That pit sand produces a better mortar than that made with river sand composed of grains of the same size. He did not find that the sharpest (*plus arides*) sands made the best mortar but thought that of sands of the same kind those which were deepest in colour, excepting the yellow, were to be preferred. The best sands, he states, are such as hold a middle place between those which are very plastic and very sharp. On comparing mortars made with freshly dug sand washed and dried in the sun, the sharp (*arides*) grains only being left, he found that the first acquired the greatest hardness, and that mortar made with very fine sand did not harden so well as that made with sand of a moderate-sized grain.

All these authors considered sea sand the worst, but Alberti mentions an exception. The sea sand from the neighborhood of Salerno he found to be as good as the best pit sand.

A FAILURE OF CAST IRON COLUMNS.

Major-General Hutchison's report to the Board of Trade, of London, England, gives the result of his enquiry into the accident which occurred on the 12th of December, at Portsmouth Harbor Station, when the roof covering the arrival island-platform was blown down by a high gust of wind just as a train was leaving. Several persons were injured, one very seriously. The fall of the roof must, Major General Hutchison says, in the absence of any other probable cause, be attributed to the effect of a sudden gust of wind during the prevalence of a gale. The zinc roof covering did not give way, but the wind pressure was transmitted toward the base of the cast iron columns—a double row of which supported the roof—with the result that one (or more) of these was at once broken off four feet above its base (which was bolted down to wrought iron cross girders, connecting the cast iron columns employed in the structure of the station), this being immediately followed by the similar fracture of the whole of the forty-nine remaining columns, and the fall of the roof. The columns were all broken in two places, the two points of fracture being in each column almost identical. The thickness of metal was intended to have been uniformly $\frac{1}{2}$ inch, and it must have been either from a deficiency in this thickness or from a flaw in the casting that the force of the wind was able to break a column thus weakened. The evidences of the witnesses does not lead to the impression that they had felt the force of the wind very excessive when the roof fell. Theoretically these columns should have been able to sustain a far greater pressure than they were ever likely to have been exposed to.

"A Draughtsman" writes to the Ottawa Journal urging the formation of an Architectural Sketch Club, on lines similar to the Toronto club. "Draughtsman" is apparently unaware that the Toronto Sketch Club has ceased to be. It should be possible for clubs of this character to be organized and maintain a useful existence in several of the leading cities of Canada.



The Ratepayers Association has resolved to petition the legislature to amend the city charter, so as to disqualify as voters at municipal elections every person in the employ of the city or having an interest in any contract with the city.

MASONIC HALL COMPETITION.

The new Masonic Temple which is to be erected on Dorchester street, from designs by Mr. Robert Brown, architect, of this city, will have a frontage of 51 feet and a depth of 109 feet. On each side of the entrance there will be stores, and in the rear a concert hall. The first floor will be fitted up as offices and assembly hall; the second floor as club and refreshment rooms, and the top floor for lodge rooms. In the basement will be the caretaker's quarters, billiard room and vaults. The cost of the building will be about \$60,000.

Following is a copy of the report of Mr. Hutchison, the expert appointed to judge the plans submitted in the above competition:—

MONTREAL, June 25th, 1894.

Will. H. White, Esq.,
Secretary Masonic Temple Company.

DEAR SIR,—I beg to report that I have examined the several competition designs sent in for proposed Temple Building on Dorchester Street.

For this competition eleven designs were submitted under nine mottos as follows:—"Shield," seal in red wax with the motto "Touch Not the Cat but a Glove"; "Complete," (three different designs); "Beta"; "Forty-seventh problem of Euclid"; "Try"; "Inter Nos"; "Wasp"; "Ich Dien."

A preliminary examination of the several designs showed that the competition for the first and second place lay between two designs—one designated by a shield and the other by a seal in red wax.

After a careful and minute examination of these designs and a comparison of the merits of each, I came to the conclusion that the design bearing the motto of a shield should be ranked first in merit, and the design bearing a red seal with the inscription "Touch Not the Cat but a Glove," should rank second.

In arriving at this conclusion I have taken into consideration that the author of the second design adhered strictly to the conditions respecting the placing of the two largest lodge rooms in the rear of the upper story of the building, and the smaller in the front, while the author of design No. 1 took the liberty of placing one of the large lodge rooms in front; this change, however, gave him no advantage over the author of design No. 2, and the selection of his design as first is made without awarding him any superiority for this arrangement.

The selection of the design as third in merit I found a more difficult task, as three of the designs approached so nearly in merit that it was difficult to determine which was best. After a careful examination I concluded that one of the designs submitted under the motto "Complete," which I have for the purpose of distinguishing it from the two designs by the same author, marked in pencil as "No. 1," is third in merit.

I have the honor to be,
Your obedient servant,
(Sgd.) ALEX. C. HUTCHISON.

ORGANIZATION OF PLUMBERS.

A general meeting of the master plumbers of this city was held in the "Monument National" building on Thursday evening, the 12th inst., for the purpose of organizing themselves into an association to raise the standard of their profession. Messrs. J. W. Hughes, W. M. Briggs, P. J. Carroll, John Date, Jas. A. Sadler, Wm. Britton, Jos. Turcotte, John Burns, P. C. Jacotel, J. Jacotel, C. St. Denis, G. W. Henders, Albert Cardinal, H. Padon, A. Sicotte were present, amongst many others whose names it has been impossible to procure.

On motion of Mr. Hughes, Mr. P. C. Jacotel took the chair. In brief terms the chairman addressed the meeting in French, stating the object for which it had been called; and requested Mr. Hughes to address the meeting in English.

Mr. Hughes said that a by-law similar to those existing in the principal cities of the United States to regulate plumbing in Montreal had been needed for a long time. He was glad to say that such a by-law had been recently passed, though it was not up to what master plumbers would have liked it to be.

A committee was appointed to consider the plumbing by-law adopted by the City Council and to report at an early date. The election of officers for the projected association was deferred to a future meeting. This association proposes to embrace all the master plumbers in the province of Quebec, with headquarters in Montreal, and branches in the principal cities of the province.

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

At a Council meeting of the Association of Architects of the Province of Quebec held on Thursday, the 12th inst., it was resolved to call a general meeting of the members of the Association, which will be of great importance to members, as it is proposed to discuss the advisability of applying to the Legislature for the purpose of making changes in the charter of the Association.