Incurables, and it was resolved to ask Mr. Gage to make the grant in affiliation with the Home.—Mr. E. J. Lennox, architect, has prepared plans for additions and alterations to the House of Industry on Elm street.—Building permits have been granted as follows: Jas. Wood, 61 Maitland st., re-erection of the Osgooby Building, Melinda st., cost $35,000; Toronto General Trusts Co., bk. add. to rear of store 58 Bay st., cost $1,500.

FIRES.

The Chicory mills at Outremont, a suburb of Montreal, were burned last week. The mills were owned by Joseph Beaubieu and were valued at $8,000; no insurance. —M. C. Wells' residence at Chatham, Ont., has been destroyed by fire.—Fire at Neepawa, Man., on the 14th inst., destroyed the *News* printing office and the Northwestern Hotel. Loss, $14,000; small insurance.—The carriage factory of Robert Blow and tin shop of W. Bailey, at South Mountain, Ont., were burned on the 13th inst. Damage to buildings, $15,000. No insurance.—G. Carter, Son & Co.'s warehouse at St. Marys, Ont., was totally destroyed by fire last week. The loss is $3,500, fully covered by insurance.—A residence at Lakeview, N. S., owned by Alexander Robertson, was burned a few days ago. Loss, $1,500; insurance, $1,000. —The workshops of the Clarry Carriage Works, Millbrook, Ont., were destroyed by fire on Thursday of last week. Loss, $1,800; insurance, $800.—D. Zant's dry goods store at Tilsonburg, Ont., was badly damaged by fire recently. The loss is covered by insurance.—The residence of Mrs. Rieves at Point-Aux-Trembles, Que., has been burned. Loss, $2,000.—The Royal Hotel at Brandon, Man., owned by Charles Pilling, was damaged by fire recently to the extent of $1,500, fully covered by insurance.

CONTRACTS AWARDED.

WINNIPEG, MAN.—The contract for placing a stone foundation under the Harris block for Crotty & Cross has been awarded to D. D. Wood.—The following tenders were received by the Board of Works cedar blocks paving for Main street: Doidge & Co., 2,000 cords at $8.45 per cord; Ontario and Western Lumber Company, 2,000 cords, $8.90; Thos. D. Robinson, 1,000 cords, $8.50; John Sinnett, 500 cords, $7.90; Robinson & Co., 2,000 cords, $9.75; John King, Fort William, 1,000 cords, $11; F. D. McDougall, 500 cords, $8 with bark, $9 for peeled; J. C. Cox, 400 cords, $5 free on board cars at Duluth; Kelly Bros. & Co., 2,000 cords, $10.45; J. G. Hargrave, 2,000 cords, $6.62 ½ with bark, $7.12 ½ peeled. The latter tender has been accepted by the Board.

OTTAWA, ONT.—The Road and Bridge Committee of the County Council received the following tenders for the construction of the new Hurdman's bridge over the Rideau river: Wm. Fennegan, Ottawa, wooden structure, $3,000, including repairs of piers; John Alexander Hawthorne, wooden $2,950; John J. Lyons, Ottawa, wooden, $4,190; iron and oak structure, $4,970; John Sullivan, Ottawa, wooden $2,550, iron and oak, $3,750; Johnston & Co., Ottawa, iron and oak, $3,618, wooden, $3,311, with $210 additional for raising piers and filling in approaches. Chas. C. Cummings, Cummings bridge, wooden, $2,975; Richard Tobin, Ottawa, wooden, $3,400; iron and oak, $4,800; Geo. Tomlinson, Ottawa East, wooden, $2,795, iron and oak, $3,789; Wm. Alexander, Ottawa, wooden, $3,370, iron and oak, $6,622.50; Viau and Lachance, Hull, wooden, $3,350, iron and oak, $4,600; H. J. Ross, Hintonburg, $3,935; Benj. Savage, Janeville, wooden, $3,408; A. W. Lang, Ottawa, wooden, $3,175; Joseph White, Ottawa, wooden $2,995; F A. Hibbard, all wood, $2,762, iron and oak, $3,632. The contract has been awarded to F. A. Hibbard, for an iron and oak structure at the above price.

ROOFING SLATE.

Professor H. Brunner, of Lausanne, Switzerland, has just published a valuable essay on the proper technical examination of roofing slate, from which we translate the following extracts. Some slates used for roofing are so poor that in a short time they disintegrate from exposure to the weather. Numerous instances are given of slate roofs which had entirely failed in less than two years after they had been thus covered. We have as yet but little data upon which to fix any standard of examination. The professor furnishes a remedy whereby such a standard can be fixed—his methods are simple and sure.

The proper examination of slate may be divided into two processes, one physical, the other chemical. The physical examination may be divided as follows: —

1. Colour.—This gives a certain indication of quality and is only useful as a matter of evenness and taste.

2. Structure.—On every slate there can be seen, especially when examined at an oblique angle lengthways, fine streaks; the direction of these is of importance. These stripes should run lengthwise, and parallel to the longer axis of the slate, and not perpendicular or at an angle to it. If the latter is the case, the slate will break easy between the nail and the exposed portion, either from pressure or movement. Connected closely with this comes:—

3. Tenacity and Elasticity.—A good slate should be hard, not easily scratched by the finger-nail; but the hardness alone is not sufficient. The power of resistance of a compact slate is greater than that of a scaly specimen. Good slate can be broken or sawed without scaling off.

4 and 5. Hardness and specific weight gives no positive data.

6. Sound.—When a good slate is struck a blow it rings; but poor slate gives a dull sound.

7. Microscopical Examinations. — To make this it is not necessary to grind a slate down thin; it is not sufficient to split off thin pieces and use the polarization microscope. Then it is easy to recognize the carbonate of lime, the pyrites (sulphurite of iron), and the markasite, or white arsenical pyrites. The latter is easily affected by the weather and therefore an injurious ingredient. If pyrites are present, brown spots of iron oxide are often to be seen, caused by the partial chemical changes. In serpentine least there are sometimes to be seen black, shiny magnetite spots. This is harmless.

8. Absorption.—To test for the amount of water slate will absorb, saw off a piece about 4¾in. long and 2⅜in. wide and immerse it in a beaker glass, the bottom of which is covered with an inch of water. Cover with a glass plate and let stand for twenty-four hours. A good slate will not be found moist more than a line or two above the water level, while a scaly and porous slate will absorb a great deal, if not all, of the water, and is therefore less likely to resist the chemical and physical influences of the atmosphere.

The chemical examination need not be very extensive. A thorough analysis is unnecessary. All that is required is the determination of the carbonates of lime and magnesia, and also the pyrites. In addition tests are to be made of the powers of resistance of the slate to atmospheric influences.

9. Determination of the Lime.—Finely pulverized slate is thoroughly stirred on a water bath with muriatic acid and a slight addition of nitric acid, filtered, washed, and the filtrate dried to separate the silicic acid, and after separating the oxide of iron and clay, determine the lime in the filtrate, then the magnesia.

10. Determination of Pyrites.—The slate, after having been digested in aqua regia, obtain the determination of the pyrite Fe S_2, by the sulphuric acid method.

11. Tests for Resistance to Atmospheric Influences. These are of the utmost importance, and by means of these, after considering the physical properties of the slate, the technical value can be established.

A piece of slate 3in. long and 1½in. wide is hung by a cord in a glass cylinder containing on the bottom a saturated aqueous solution of sulphurous acid, the vessel to be well corked, and let stand at ordinary temperature. A bad slate will begin to disintegrate within twenty-four hours; it will begin to flake off, or, if compact, become spongy and friable. A good slate will resist this action from four to six weeks, and sometimes for months. The rapid disintegration is due to the pyrites and carbonates contained in it. The first is partially changed into sulphuric acid, which will in turn act destructively on the other minerals, while the carbonates, under the action of the carbonic acid and water, are converted into bicarbonates, which become soluble, making the slate spongy, and by giving off CO_2 will heat and further loosen the slate. In these artificial atmospheric tests the carbonate of lime is attacked. The action of the atmosphere goes hand in hand with the carbonates present.

The slate may also be tested for resistance to cold by immersion in snow and salt, and for heat by exposure for five or six hours to a temperature of 480 degrees to 575 degrees Fahr.

For a quick, approximate test of the technical value of a slate examine its physical properties and try the following reactions:—

1. Muriatic acid is poured on the pulverized slate. Strong efferveseence indicates a bad slate, because it shows that it contains too much lime.

2. Heat some of the powdered slate in a glass tube. A yellowish sublimate of sulphur and giving off sulphurous odour shows the presence of pyrites, a bad slate.

As an example, four speimens of slate were tested with the following result:—

No. 1, under the microscope, showed presence of pyrites, specific gravity 2·6901, completely saturated in the absorption test, disintegrated in three days, contained 16·252 carbonate of lime and 0·9801 pyrites—pronounced bad.

No. 2 showed, under microscopic pyrites, specific gravity 2·9090, absorbed considerable water, disintegrated in sulphuric acid in eleven days, contained 4·831 carbonate of lime and 0·882 pyrites—pronounced bad.

No. 3, little pyrites, specific gravity 3·0812, absorbed water only slightly, remained unaltered in sulphuric acid six weeks, had only a trace of carbonate of lime and pyrites pronounced very good quality.

No. 4 contained much pyrite, specific gravity 2·7913, absorbed only a trifle of the water, disintegrated in nine days, contained 3·972 carbonate of lime and 1·1017 pyrites—pronounced not good.

Geological conditions cannot be used to determine the quality of a slate, because we find slate of the same geological formation and age but even from the same quarry with essentially varying qualities. It may be said, in conclusion, that good qualities of slate are much more rare than is generally believed. A good slate being so hard to find makes the good very valuable.

E. L. de La Vallée-Poussin and G. de La Vallée-Poussin will carry on business as contractors in Quebec under the style of E. L. de La Vallée & Co.