stead, was totally destroyed by fire on the 31st of August. There was no insurance on the building.—The Commercial Hotel at Vankleek Hill, Ont., owned by George Constantineau, was completely destroyed by fire on Wednesday of last week. Loss $10,000; insurance $4,500.—The brick residence of Peter McNally, of South Norwich, near Tilsonburg, Ont., was consumed by fire on the 1st inst. The loss is about $7,000, with $2,000 insurance. —John McMulkin's shingle mill at Marble Cove, St. John, N. B., was burned on Saturday last. The loss is estimated at $7,000.—The Revere House at Simcoe, Ont., owned by Mr. McQueen, has been burned. Loss, $3,000.—The residence of Dr. Underhill, Mission City, B. C., was totally destroyed by fire last week. Loss $3,000.

CONTRACTS AWARDED.

GODERICH, ONT.—The contract for laying the intake pipe has been awarded to William Lyons, of Windsor, the figure being $5,000.

FREDERICTON, N. B.—The contract for the Victoria hospital annex has been awarded to William J. Scarr and William Minue, at the price of $3,000.

HAMILTON, ONT. — Contracts for sewers have been let as follows: Poulette street, E. C. Murton, 50 cents a foot; Florence street, J. J. Armstrong, 23 cents a foot.

GRIMSBY, ONT.—The contract for building an iron bridge over the Forty Mile creek has been awarded to the Stratford Bridge Company. W. F. Gibson, of Beamsville, gets the masonry work.

LINDSAY, ONT.—W. G. Woods has secured the contract for the hot water heating of Wm. McKennzie's summer residence at Kirkfield. Oxford radiators will be used.—Smith & Co. will put a furnace in the Benson House.

WINNIPEG, MAN.—Tenders for asphalt pavement on Assiniboine and Kennedy streets were received as follows: Kelly Bros., natural stone, $18,964.60, $2.35 per yard, stone 87 cents and $1 (accepted); the Warren Scharff Co., natural stone, $21,285, artificial stone, $20,215, $2.60 per square yard for pavement, $1 and $2 for natural stone, 80 cents for artificial.

MONTREAL, QUE. — The Lachine Rapids Hydraulic & Land Co. have closed a contract with the National Underground Conduit Co., of New York, for 500,000 ft. of conduit. The duct is a cement lined pipe, embedded in concrete. —W. McLea Walbank, architect, has awarded the following contracts for a house, 3 storeys, corner of McCord and Seminary streets, for the Lachine Rapids Hydraulic and Land Co.: Masonry, J. B. St. Louis; carpenter and joiner's work, Shearer & Co. Other contracts not let.— P. Lortie & Son, architects, have let contracts as follows for a house, 3 storeys, on Inspector street, for Dufort & Desrochers: All trades by day work. — C. St. Jean, architect, has let the contract for the Cathedral and Sacristy of Nicolet, for the Roman Catholic Episcopal Corporation, to Paquet & Godbout, of St. Hyacinthe. The dimensions are 192 ft. by 97 ft., with the steeple 185 ft. high. The Sacristy is 62 ft. by 43 ft.—Barkeau & Fournier have been awarded the contract for the masonry for the residence of H. Weir, to be erected on Drummond street. Gamelin & Huot are the architects.—The following contracts have been awarded by M. Eric Mann, architect, for a varnish factory: Masonry, Hegan & Stewart; carpenter and joiner's work, Robert Neville; brick, S. Wand. Other trades not let. —The contract for the concrete dam, power house and rock excavation in connection with the development of the Chambly water power has been awarded by the Lachine Rapids Hydraulic & Land Company to Messrs. Peter Lyall & Sons. There were eight or nine tenders. The contract embraces from $300,000 to $400,000 and will be begun immediately and carried on all winter, the entire job to be completed by October, 1897.

MIXING CONCRETE.

In the making of concrete the matter of mixing is fully as important as the choice of the materials used, for with unskillful methods there may be a vast amount of waste, both in the quantities of materials used and in the final strength of the concrete mass. It is possible to obtain as strong and as satisfactory results with a small amount of cement and a large amount proportionally of well chosen aggregate as with a large amount of cement and haphazard mixing with ill chosen aggregate. In any good concrete the main object is to fill the voids. The spaces between large stone should be filled with smaller stone; these spaces so reduced should in turn be filled with sand of a coarse variety, and then the smallest spaces filled entirely with cement. Every piece of stone and particle of sand, therefore, should be coated well with cement, and the best results are obtained where there is not too much of any material—stone, sand or cement. Large masses of pure cement scattered through a mass of mass of concrete shows a waste of good material, for a piece of good hard stone would do better work in the place of the mass of cement, and it would cost a fractional part as much.

There has been more or less discussion as to the kind of material that is best in concrete making. First, in regard to the size: For heavy and massive work, large stones may be used, sometimes as large as a man's head. Then the rest of the stone may be graded down so as to have the spaces between the stone well filled. The matrix should be composed of coarse sand, at least as large as the coarsest granulated sugar, and the cement should be thoroughly mixed with this sand before the mortar so formed is incorporated with the stone. Only sufficient water should be used to insure a stiff tenacious mass. It is often advisable to wet the stone and coarse material before mixing. As for the kind of aggregate that depends wholly on the use to which concrete is to be put. For heavy loads and masonry of high order, only hard broken stone, balast, granite, etc., should be used. For fire proof work use broken brick, pottery, clinker, slag, and such material as withstands great heat. For light floors, filling, etc., use crushed coke, clean cinders, etc. For heavy wear in pavements use pea granite or other hard stone. There is a good deal of controversy at present among engineers, says Ross F. Tucker in the Brickbuilder, as to the relative value of broken stone and round pebbles in making concrete. Tests have been made which show no practical difference in the strengths of concrete made under similar conditions with the two materials, yet judgment and reason would certainly choose stone in place of pebbles for important work.

There is often a confusion of ideas in naming the proportion of the materials for making concrete, due to the fact that it is not generally understood that three parts of sand and six parts of coarse 2 inch stone do not make nine parts together. The voids in coarse stone amount to about 47 per cent. of the mass, or, roughly, 50 per cent., which means that it is necessary to add to a certain mass of stone nearly half as much sand in order to fill the voids without increasing the bulk at all. According to Trautwine the following table gives the perfect ratio:

1 cubic yard of broken stone with 0.5 of its bulk voids requires 5 cubic yards gravel or fine stone.
0.5 cubic yard gravel or fine stone, with 0.5 of its bulk voids requires 0.25 cubic yard sand.
0.25 cubic yard sand with 0.5 of its bulk voids requires 0.125 cubic yard dry cement.

So when a mixture is stated by the formula 1—3—6— the result is a mixture of one part of cement to six parts of aggregate, and not of nine parts of aggregate, as might be assumed. This is a matter of much importance, not only in estimating, but in the strength of the concrete, for if one mixture is made of one part cement and, say, six parts of broken stone, and another mixture is made of one part cement, two parts sand, two parts of small stone, and six parts of large stone, the result of the second mixture will be far superior to the first in economy of materials, volume, and equal in strength. In all cases this idea should be developed to its fullest extent, where concrete is used intelligently.—Carpentry and Building.

STRENGTH OF BRIDGE AND TRESTLE TIMBERS.

A committee of the International Association of Railway Superintendents of Bridges and Buildings appointed to report on the strength of bridge and trestle timbers, have arrived at the following conclusions:

(1) Of all structural materials used for bridge and trestles timber is the most variable as to the properties and strength of the different pieces classed as belonging to the same species; hence it is impossible to establish close and reliable limits for each species.

(2) The various names applied to one and the same species in different parts of the country lead to great confusion in classifying or applying results of tests.

(3) Variations in strength are generally directly proportional to the density or weight of timber.

(4) As a rule, a reduction of moisture is accompanied by an increase in strength; in other words, seasoned lumber is stronger than green lumber.

(5) Structures should be, in general, designed for the strength of green or

(Concluded on Page 4.)