plans for two semi-detached houses, to be built of pressed brick and stone, on Sherbrooke street, Cote St. Antoine for Mr. Alfred G. Walford.—Messrs. Ogilvy & Sons, dry goods merchants, have decided to erect a large business establishment at the corner of St. Catharine and Mountain streets, the site for which has been purchased.—The Montreal Temple Company was organized on Tuesday night last, the object being to erect a Masonic Temple. The following directors were elected :—J. H. Steaine, F. Fdgar, B. Tooke, Fred. Massey, John McLean, James Fyfe, W. W. Whyte, J. B. Fressider.

TORONTO, ONT.—The excavating is being done for a pair of houses to be erected on the east side of Madison ave., north of Lowther ave.—Several new houses are to be erected on the west side of Bedford Road, north of Lowther ave.—The site is being cleared for the erection of a new building on the east side of Clare street immediately south of Queen street. —The City Council has given notice of its intention to construct a cedar bloc pavement with stone kerbs on Carr street, from Esther street to end of street, at a cost of $3,000.—The City Council at its meeting on Monday last, adopted the report of the Property Committee recommending that tenders be asked for at once for the extension and enlargement of the Yonge street wharf, the cost of which is placed at $25,000.—Mr. E. R. Babington, architect, 28 Toronto street, wants tenders for building a brick stable, also for plumbing.—The City Engineer is preparing a report on the opening of Bellair street through to Ketchum Park. The cost, including the roadway, is estimated at $10,000.—A Court of Revision will be held on the 20th inst. for the hearing of appeals against the construction of the following works: Sewer on Severn street, cost $940; sewer on May street, cost $775; cedar block roadway on Ulster street, cost $775; cedar block roadway on Mansfield avenue, cost $700; cedar block roadway on Rosebery avenue, cost $820; grading on Wilson street, cost $900; grading on Kippendavie avenue, cost $4,198,29; sidewalk on Oxford street, cost $156.—At the last regular meeting of the Technical school board, a resolution was brought forward asking that the City Council be petitioned to provide increased and permanent accomodation for the said school.—Building permits have been granted as follows: B. Pickering, 70 Hazleton ave., two det. 2 story and attic brick dwellings, 64 and 66 Glen Road, cost $17,000; Bickell & Wickett, 3 story brick addition to tannery, e. side Cypress street, cost $2,000; Mrs. S. S. Ramage, two story brick dwelling, 192 Munro st., cost $1,800.

FIRES.

Two residences at Hintonburg, Ont., owned by Mr. Jones and Mr. Thomas Matthews, were destroyed by fire last week. Loss, $1,500 on each house.—The factory of the British Columbia Jute and Cooperage Company, at Vancouver, B.C., was destroyed by fire on the 2nd inst. Loss, $30,000, covered by insurance.—A residence on Queen street, Quebec, owned by Mrs. Bedard, was burned last week. Loss, $1,200.—Mr. C. Audet's machine shop at St. Anselme, Que., has been destroyed by fire, Loss, $25,000.—Wm. Posseltrate's carriage and paint shop at Merrickville, Ont., was burned recently. Loss, $2,000. — The machinery in the works of the Dominion Horseshoe Nail Company, 61 Dalhousie street, Montreal, owned by J. E. Beaudoin and F. Dagenais, was damaged by fire on Monday last to the extent of 5,000. The loss is covered by insurance. — Mr. William Mitchell's residence at Droummonville, Que., was burned last week. Loss $8,000.— The church of St Andrew's Kirk at Pictou, N. S., a stone and brick structure, was destroyed by fire on Tuesday last. Loss, $35,000; insurance $10,000.—The *Legal and Commercial Exchange* reports the destruction by fire of the Armstrong Hotel at Armstrong, B. C., loss, $6,000, and the Palace Hotel at Booners' Ferry, B. C.

CONTRACTS AWARDED.

MONTREAL, QUE.—Dunlop & Heriot, architects, have let the contract for the erection of a brewery for H. A. Ekers. The building will be 83x50 ft., three stories high, front to be of Montreal stone and of Normal style. Mr. Wm. Oman has the contract for masonry, other trades will be carried out by day work.

OTTAWA, ONT.—Mr. George Goodwin, one of the contractors for the Soulanges canal, has transferred section 11 to Mr. T. F. Frency. Mr. Goodwin has five sections still to construct.—The contract for the erection of the new contagious disease hospital on Porter's island has been awarded to Mr. John Bruce. The price is $16 400. Mr Bruce will commence operations as soon as the arbitrators have decided the price to be paid for the island.

BUSINESS NOTES.

Petit & Coulter, brick manufacturers of Otterville, Ont., have assigned to R. Paxton.

Mr. G. E. Grove has purchased the wall-paper business of Faircloth Bros. Toronto.

Mr. S. R. Armstrong was appointed Town Clerk of Peterboro', Ont., at a meeting of the Council on Monday last.

A statement of the affairs of John Goddard, stonecutter and contractor, Toronto, who assigned recently, shows a nominal surplus of $23,550.

Rochon & Frere, contracting carpenters, Montreal, have assigned at the demand of Alphonse Pallascio, with liabilities of about $20,000.

The creditors of Messrs. C. B. Wright & Sons, cement manufacturers, of Hull, Que., have formed themselves into a joint stock company to carry on the business.

The *Legal and Commercial Exchange* report the following: Phileas Hetu, plumbers, Montreal, has assigned, liabilities about $7,000.—The stock of W. H. McAlpine, lumber dealer, Montreal, is advertised for sale.—Taylor & Davis, painters, Vancouver, B. C., have dissolved partnership, Mr. W. S. Taylor continuing.

FIRE CLOSETS.

The question of open water closets, their attendant unsanitary evils and inconvenience, together with possible solutions of the difficulties originated by their existence, have formed the subject matter of very many articles in architectural and sanitary journals. These open receptacles of filth and disease have been subjected to universal condemnation not only by sanitary and medical authorities, but even by the persons who are so unfortunately situated as to be enforced to make use of them. Owing to the absence of sewer and water privileges, they are left no alternative but to use the open pit.

The intolerable odors arising from open closets, though decidedly objectionable, are not necessarily the greatest source of danger, for the most poisonous of these gases are often free from any perceptible odor. Thus persons forced to make use of the privy pit are in a state of constant dread no matter what precaution they may take. So-called Deodorizers do not destroy the dangerous germs, and are too often more disagreeable than the odors they are expected to counteract. Our purpose is not then to reiterate the acknowledged fact that privy pits are a fruitful source of the worst forms of fever and disease, but to direct the attention of our readers to recent experiments which appears to have solved this vexed question in a sanitary and practical way by applying the only certain agent known to science for the absolute destruction of disease germs, viz, fire. We learn that patents have recently been taken out by parties in both the United States and Canada, and that fire closets in all sizes are even now being manufactured, which are applicable to public buildings, schools, factories and dwellings. These closets are erected with ventilating pipes, and so designed that fire is applied at intervals as required (when closet is filled) and their whole contents cremated. The apparatus is so constructed that not only the solid matter but all gases created in its burning are likewise destroyed. Thus the process of cremation is complete. Such a closet should prove an incalculable benefit to all those who have been heretofore compelled to use open pits. The chief merit of this new apparatus appears to be that it provides for the immediate destruction of the excrement before it has had time to become insanitary.

PILE DRIVING.

A falling body cannot do more work when its progress is arrested than has been done on it when lifting it up to the height from which it has fallen. This is a fundumental and unalterable principle. Thus, for example, let us suppose that the ram of a pile driver weighs one ton, and that it falls 4 feet onto the head of a pile; then the work in the ram cannot be either more or less than that which is equivalent to four-foot tons. Thus, the work in the ram at the moment it touched the head of the pile would be sufficient to raise the ram up again to the point from which it fell; or to raise a weight of four tons to a height of one foot; or to raise one pound through a height of 8,560 feet; or to raise forty-eight tons through a height of one inch. Now, it is clear that if the ram were employed to raise one ton through a height of four feet, it must exert a force of one ton throughout the distance of four feet. If it did not it would not remove one ton at all, for it would be overbalanced. If it were called upon to raise four tons through a height of one foot, then it must exert a push of four tons through a distance of one foot; if to lift a weight of forty-eight tons, then it must exert a push of forty-eight tons through the distance of one inch, and so on.

Bearing this in mind, there will be no difficulty in understanding the following simple rule: The force of a blow is measured by dividing the whole distance passed through by the ram before impact by the distance passed through after impact, and multiplying the weight by the quotient. Thus, let the ram weigh one ton, let the fall be forty-eight inches, let the pile descend one inch at each blow, then the push or effort exerted by the ram on the top of the pile will be $\frac{48}{1} = 48 \times 1 = 48$ tons. It must be understood that this is the mean or average force of the blow. Its initial effort may be much greater and its terminal effort much less, because at the instant of impact the ram is moving at its full velocity, while at the instant the pile ceases to descend it will have no motion at all, and consequently will exert no push, except that due to its weight.

Three factors are in all cases necessary, namely, the weight, the height of fall, and the distance through which the body which receives the blow moves. In practice it is by no means easy to ascertain the latter with precision; and the energy in the falling body can be expended in more ways than one. For example, when the head of a pile is struck, two effects take place simultaneously, the ram is shortened and so is the pile. The elastic rebound of each immediately takes place, and the ram jumps up from the top of the pile. Again, the top of the pile becomes highly heated. The elacticity of the pile plays an important part in influencing the rate of its descent. A ram weighing 100 pounds, falling a height of fifiy feet, will have stored in it on impact 5,000 pounds, and if the progress of the pile were one inch, its driving force would be 60,000 pounds. A ram weighing 1,000 pounds and falling five feet, would also have 5,000 foot pounds of work in it, and would exert a driving force of 60,000 pounds over a space of one inch; but it does not follow that the former would be equally effective in driving the pile. On the contrary, the lighter ram striking the pile wtih a higher velocity might be much the less efficient of the two, because the force of the blow would not be transmitted through the pile, but would be expended in compressing the top of it. When a pile is struck on the top, what is known as a wave of compression passes through it; and this wave requires time for its passage. Such a wave is set up in all columns when stress is suddenly brought on one end. The effect of a heavy ram falling a short distance on a pile head resembles a push, in a sense, and gives time for the transmission of the effort throughout the whole pile, but when a light ram falls the effect may be confined to the top of the pile, which is shattered.

The velocity with which a ram strikes a pile head is calculated by the extracting of the square root of the height of fall in feet and multiplying it by eight. Thus, let the ram fall four feet; the velocity will be sixteen feet per second. If the ram falls fifty feet it would strike the pile with a velocity of fifty-six feet per second. If this speed was greater than that at which the wave of transmission could pass through the pile, then little or no effect would be produced in the way of causing its descent; as nearly the whole of the work would be done in compressing the top of the pile, or in shattering it, and the driving effect would be nothing. The effect of the element of time is not sufficiently well understood. About the only thing fully understood or accepted is that a heavy ram falling from a moderate height is, other things being equal, much more efficient than a light ram falling from a great height.—*The Mechanical News.*

MUNICIPAL DEPARTMENT.

AUSTRALIAN PAVING WOODS.

The use of Australian timber in England is increasing year by year, and it is crowding out all other woods, domestic and foreign, for street paving. The better woods are much more expensive than those grown in Europe or America, but it has been proved beyond a doubt that while the first cost may be greater, in the end it is the cheapest. It is now only about six years since the first shipments were made to London of jarrah and karri woods for street paving, and owing to the unsatisfactory results of previous experiments with oak, elm, beach and pin, there was much opposition to their introduction, but so far they have given excellent results and are being largely adopted for the carriage-way pavements of London. From *Engineering* published in London, we learn that these woods have been put down in eighteen wards, and that wherever the wood has been laid down in a proper manner it has given the most satisfactory results. Three thousand one hundred and sixty-seven loads, each of 600 square feet of jarrah and karri woods were used in the city in one year, and its consumption is rapidly increasing.

SEWAGE UTILIZATION.

Some important results have lately been obtained in the utilization of sludge from the sewage of London as a fertilizer. The enormous sewage of the British Metropolis, poured into the lower Thames, caused such a nuisance that chemical treatment was adopted. This precipitated the solid matter in settling basins, leaving the liquid to run into the sea in a harmless condition. The solid matter, or sludge, was then taken far out to sea in steamers and dumped in deep water.

Last year the fertilizing qualities of this sewage sludge, pressed into cake, were given a test that demonstrated its value. Ten tons of it were spread upon poor sandy soil alongside one area treated with the best farmyard manure, and another with artificial fertilizers. The best results were obtained from the sewage sludge and the worst from the artificial fertilizers.

This has started a demand for the sewage sludge on the part of farmers, and the metropolitan board of works, in charge of the London sewage, has decided to press the sludge into cakes in proportion