

example, the deaths from diphtheria in 1885 were only 64 as compared with 202 in 1887. Perhaps if these figures had been published a little earlier, the citizens would not have voted down the by-law to provide money for the construction of a trunk sewer. It is to be hoped the incoming Council will present to the citizens at an early day a fully considered scheme for disposing of the city sewage. As suggested by the Medical Health Officer, the time has also arrived when the Council should order the filling up of all privy pits and wells, at least within the thickly-populated portions of the city, and prohibit kitchen stoves and refuse to be thrown into back yards, there to exhale poisonous disease germs. Careful attention to these matters and to the purity of the water supply would, we believe, greatly lessen the prevalence of infectious diseases.

**A**n investigation of the records indicates that there was expended in new buildings in Toronto last year about \$1,250,000. This is something like \$100,000 less than in 1886, a fact due to the prolonged strike on the part of workmen engaged in the building trades last summer. The most important of the building permits issued during the year are recorded on another page of this paper. The fact that permits are only required from persons building within the fire limits, and that many persons within said limits evade the regulation requiring permits to be obtained, will show that a large proportion of the building done is not indicated in the record. As shown by our correspondent's letter, Montreal expended in 1887, about \$4,000,000 in the construction of 1100 new buildings. The extent of operations in other cities and towns is indicated under the heading "The Record of 1887," and shows a satisfactory rate of progress. Advances to hand seem to indicate that building operations during the year 1888 will be brisk, especially in this city and in Montreal, where a number of public and other large buildings are to be commenced. We trust that common-sense methods will be adopted by employers and employees to settle the hours of labor and rate of wages, so that the strikes which have resulted so disastrously in past years may not be repeated.

**S**OME people are very proud of what they are pleased to call their democratic principles. Unfortunately it sometimes happens that in their anxiety to be thought democratic, they show an entire disregard of the recognized canons of good taste. The other day, for example, a writer in a Toronto daily paper related a remark which a young lady was overheard to make, to the effect that it was a pity that a long row of houses—every one alike—should have been built on St. George street, as they were out of harmony with the tastefully-designed residences and handsome lawns which make that such a delightful thoroughfare. Satisfaction was expressed by this democratic writer with the action of the "enterprising builder," who put up the houses and contempt for the "aristocratic notions" of the young lady. As a matter of fact, the remark made by the latter was one that might naturally be expected to fall from the lips of any person possessing even in a limited degree the ability to decide between beauty and deformity. The fact is that the "enterprising builder" has been allowed to follow too much his own sweet will in the building up of this city. The result of his operations appears in row after row and street after street of houses, all apparently constructed after the one design, and exhibiting to the beholder a uniformity that is monotonous and extremely uninteresting. This does not apply to the more expensive class of houses built during the last five years, which display a variety of design which is in pleasing contrast to those we have been speaking about. It is to be hoped that the departure from the old stereotyped methods and designs which has already commenced, will mark the future growth of the city, and that, even at the danger of exposing himself to the contempt of the man of democratic ideas, the "enterprising builder" will fall into line with the march of improvement and the dictates of good taste.

**F**ROM small beginnings and under disadvantages and rebuffs all great reforms seem to flourish most satisfactorily. A few years ago a number of gentlemen whose profession led them to be deeply interested in questions affecting public health, formed an association for the study of sanitary questions and the spread of sanitary doctrines. For some time the association was successfully carried on, and much interest taken in its proceedings. Last year, from some unaccountable reason, it collapsed suddenly. This is a matter of sincere regret. However, it left a legacy behind it, in the form of a draft of a Health Act, and more particularly of a

Plumbing By-law for the city which has since been adopted by the City Council, and one of its chief recommendations has been carried out in the appointment of two inspectors of plumbing. It is gratifying to learn that at the examinations held, the candidates presented papers of great excellence, showing much study and thought on the prime questions of health. Thanks to the energy and determination of the chairman of the Local Board of Health, we are now embarked on a system of thorough inspection of all plumbing, and the inauguration of the greatly-needed measures which will tend to promote the healthiness of the citizens and protect their lives, more than fresh air in open parks. Although the by-law has been enforced for a few weeks only, the change is marked already. No prosecutions have yet been necessary to cause architects or plumbers to fall into line, and we are very pleased to learn that firms who are occupying the first places in the profession are fully in accord with the spirit of the by-law. The point at which the shoe will pinch is not in the upper class of work, but in the house "with all modern improvements." We do not desire to interfere with the enterprise which is building up our city so rapidly, but we wish to point out as a duty from which we will never shrink; that the person who introduces plumbing into a house, and the workman who contracts to put it in, hold the lives of their fellow citizens in their hands and exercise an influence which no physician pretends to do. It is in the houses of our artisans where the greatest evils occur. Builders, speculative or otherwise, must be brought to learn that it is their duty to construct houses with such safeguards from sewer air and other mephitic vapors that the health of the inmates shall not be endangered. It is a gross injustice for those who know how dangerous the entrance of sewer air is to the health of the inmates to cover up joints with putty, slip clay pipes together merely cementing the upper part of the joint, or supply cast iron pipes of the thinnest calibre. Far better to have only a sink properly arranged, than "all modern improvements" which are a snare and delusion, source of bad health, and the cause of death.

#### BRIDGE INSPECTION IN CANADA.

**A**n subject is scarcely needed for making this the subject of the first article on engineering topics in this new journal; as none who has read the news of travel for the last quarter of a century or less will deny its vital importance, from the fact that, of all accidents to travellers on land, the most appalling and fatal beyond all controversy have been bridge accidents.

Mr. Telford, the father of the engineering profession in England, when seeking from George IV. a charter for the Institute of Civil Engineers, defined engineering to be "the art of adapting all the forces in nature to the use and benefit of man," and a pursuer of this art who, when the above department of the profession comes within his province, does not, by giving it his most skillful attention, aid in bringing into use the safest and best-contrived patterns, is culpably untrue to so noble a standard; and those whose part it is to scrutinize the engineers' work are even more guilty if they do not require a full and intelligent conformity to the same.

Without intending to seat ourselves unflinchingly in the place of judgment, we think that we can perceive the pressing need existing for a marked change in the system of inspection of bridges by the Canadian Government. In the first instance, personal experience shows that the oversight of bridges by Dominion engineers during their erection is not invariable; and after erection, the tests used by them are not as crucial as the urgent claims of the case call for. Secondly, that this is becoming a real and felt want in the States where bridges are generally the same pattern as those in Canada, is plain from a communication read by Mr. Willard S. Pope, President and Engineer of the Detroit Bridge Company, before the American Society of Civil Engineers, who have been lately considering it. He strongly urges the appointment of a Government commission, headed by an engineer of the highest skill and integrity, without conformity to whose standards the building of no bridge should be begun; without whose examination, none should be carried forward or opened for traffic; and whose officers should inspect all bridges annually. Thirdly, in Great Britain, except in the matter of annual inspection, all the above ground is more than covered, it being a *sine qua non* that, besides drawings of all bridges, full descriptions of every class must be deposited with the Government before railways, etc., are begun. Its officials make periodical inspections of same during erection, and, prior to traffic, exhaustive tests.

It may, therefore, be confidently expected that a Government so forward in keeping pace with the march of pressing progress as that of the Dominion will not be behind in this instance.



White paint to be a very durable paint has been made of a very finely powdered zinc, mixed with oil and siccative. A varnish of this produced which may be applied with a brush in the ordinary way.

A brilliant black varnish for iron, stone, wood or concrete can be made by stirring up ivory black in ordinary shellac varnish. It ought to be applied to the surface, when the article to be coated is cold.

**TO CLEAN MARBLE.**—The following process is recommended: Wash the surface with a mixture of finely powdered pumice stone and vinegar, and leave it for several hours, then brush it hard and wash it clean. When dry, rub with waxing and with leather. Oiled and varnished acids are also used, but they will injure the polish of the marble.

A brick, says a technical contemporary, being about as porous as a lump of sugar, and having six sides, needs a careful filling for water-tight work in ocean-pools, etc., and a thin grout or porridge of cement is commonly used. Heating the brick and soaking beforehand in this material has been recommended. A common way common wall all his life without learning how to make brick water-tight.

**DURABILITY OF WOODS.**—In some tests made with small squares of various woods buried an inch in the ground, the following results were noted: Birch and aspen decayed in three years; willow and horse chestnut in four years; maple and red beech in five years; oak, ash, hornbeam and Lombardy poplar in seven years; oak, Scotch fir, Weymouth pine and silver fir decayed to a depth of half an inch in seven years; larch, juniper and arbutus were unharmed at the expiration of the seven years.

**TO MAKE CAST BRASS HARD AND DUCTILE.**—It is said that 2 per cent by weight of finely powdered bottle glass placed at the bottom of the crucible in which red brass is being melted for castings gives great hardness and at the same time ductility to the metal. Ferrous castings are said to be almost an impossibility when this is done, and the product is likely to be of great service in parts of machinery subject to strain. An addition of 1 per cent of oxide of manganese facilitates working in the lathe and elsewhere where great hardness might be an objection.

**BROWN STAIN FOR WOOD.**—A brown stain for wood for the imitation of oak, walnut and cherry tree wood is obtained by thinning ordinary tincture of iodine with alcohol, more or less, being added of the latter according as a lighter or darker shade of brown is desired. The stain should be applied with a broad brush or rag. After it has dried, the work should be polished. It is possible, however, to dispense with ordinary French polish by adding white shellac to the stain. One or other of these processes of polishing is indispensable to give permanency of stain.

**PLASTER FOR MOUNDINGS.**—Where walls and ceilings are to be moulded whilst yet in a plastic state, some decorators are using a fibrous plaster with the object of securing greater firmness and durability. The idea itself is not new, animal hairs having formerly been combined with lime, but this is a new application. In England and France a fine wire netting is at times inserted between two courses of plaster, to afford greater firmness in holding picture frames. The tenacity of some of the old mouldings in old New York houses, whilome aristocratic, is very remarkable, retaining as they do their original sharpness of outline.

**GIVING STEEL A LUSTRELESS POLISH.**—A finely polished, lustreless surface on wrought steel can be produced by either of the following operations: After the steel article has been tempered it should be rubbed on a smooth iron surface with some pulverized oil-stone until it is perfectly smooth and even, then laid upon a sheet of white paper and rubbed back and forth until it acquires a fine, dead polish. Any screw holes or depressions in the steel must be cleaned and polished beforehand with a piece of wood and oil-stone. This delicate, lustreless surface is quite sensitive and should be rinsed with pure soft water only. A more durable polish is obtained by first smoothing the steel surface with an iron polisher and some powdered oil-stone, carefully washing and rinsing. Then mix in a small vessel some fresh oil and powdered oil-stone, dip into this mixture the end of a piece of elder pith, and polish the steel surface with a gentle pressure, cutting off the end of the pith as it commences to become soiled. In conclusion it should be thoroughly cleaned in soft water, when the article will be found to have a fine, lustreless polish.

**HOW TO MAKE LIGHTNING RODS EFFECTIVE.**—Prof. Tyndall, in a letter on lightning conductors, points out that the abolition of resistance is absolutely necessary in connecting a lightning conductor with the earth, and this is done by closely embedding in the earth a plate of good conducting material and of large area. The largeness of area makes atonement for the imperfect conductivity of earth. The plate, in fact, constitutes a wide door through which the electricity passes freely into the earth, its dissipating and damaging effects being thereby avoided. A common way of dealing with lightning conductors, adopted by ignorant practitioners is, Dr. Tyndall remarks, to carry the wire rope which forms part of the conductor down the wall and into the earth below, without any terminal plate. Such a "protection" is a mockery, a delusion, and a snare. Some years ago a rock light-house on the Irish coast was struck by lightning, and was found by the engineer's report that the lightning conductor had been carried down the light-house tower, its lower end carefully embedded in a stone perforated to receive the object had been to invite the lightning to strike the tower arrangement could hardly, he believes, have been adopted if the conductor, as the contact of link with link is never per-