

least 6 lbs. to the square foot." The requirement that iron pipe shall be rendered impervious to gas or liquids was probably inserted in this rule to ensure a liberal coating of coal tar to the cast iron soil pipe. It has been found, however, that the coal tar varnish covered up sand-holes and other defects in the pipe, so that now untarred pipes and fittings are mostly used after having been immersed in linseed oil to prevent them from rusting. The only proper way to render cast iron soil pipe impervious to gas or liquids is to require a good thickness of metal, and a standard for the different sizes should undoubtedly be laid down in the Public Health Act. This would please the manufacturers, because they would require but one set of patterns; it would please the wholesalers because they would require to stock only the standard sizes; it would please the master plumbers because they would then not fear the dishonest rival underbidding on light pipe; it would please the plumber because it would lessen the danger of having to remove cracked pipes and fittings when the water-test is applied; and last of all it would be a great benefit to the householder, as he would have the foundation of a good plumbing job ensured.

The requirement that the waste from every fixture should be trapped and vented, is a good general rule, although there are some cases where trap vents are not necessary. The word "safe" must have crept into the list of fixtures unawares, as it has long been considered a violation of the rules of good plumbing to connect a safe-waste direct with any drain. Safes of sheet lead were usually placed under the old fashioned boxed-in plumbing fixtures to prevent water from leaky or defective baths, etc., going through the floor and injuring the ceiling below. It is quite possible that sufficient water might never be caught in a safe to fill a trap on its waste, hence it should not be connected direct with the plumbing system, but empty openly into some lower fixture. Fortunately safes are now seldom required since all fixtures are left open and if any water leaks onto the floor it may be easily seen and mopped up. The conclusion of rule 3 is somewhat indefinite, viz: "All joints shall be constructed so as to prevent gas escaping through them." The section of the Toronto plumbing by-law governing this matter is much more practical and is as follows: "Every connection between lead and iron pipes shall be made with brass thimbles or ferrules, having properly wiped joints, and the ferrules shall be properly gasketted, leaded and caulked into the said pipe. Ferrules for four-inch pipe shall weigh not less than two and a half pounds; for three inch pipes not less than one and three quarter pounds, and for two inch pipes not less than one and a half pounds; each ferrule to be not less than four inches in length. All lead pipes shall have properly wiped joints. When the trap to closets is above the floor, the connection of the same with the soil-pipe shall be made of brass and rubber, said brass flange to be not less than three sixteenths of an inch thick and cast."

Rule 4 is a good general rule, but, in spite of it, the writer has recently found in one of our Ontario towns a new plumbing job with the universally condemned pan closet fitted up. The water closet is perhaps the most important plumbing fixture in a house and the styles made are innumerable, although but two types of closets are now generally used. The older of these is the "hopper" closet, consisting of a straight hopper discharging into an S trap, and forming a good closet from a sanitary point of view, although objected to by the fastidious as its walls are not easily kept clean without almost daily attention. In an attempt to remove this objection, the wash out closet was designed, being in reality a distorted hopper discharging into the same form of trap. This arrangement does not remove the filth, but puts it out of sight and where it is more difficult to get at. The true solution of the problem was the construction of a hopper closet in one piece with the walls more nearly perpendicular, and a larger and deeper pool of water in the trap. This forms what has been termed the "wash-down" closet now coming into general use. The remaining type of closet is used in more expensive work and is composed of the various forms of "syphon" closets. These have deep pools of water and have various devices to start syphonic action to remove the contents rapidly.

Tinned copper baths are now the most frequently used, and when "steel-clad," require no work around them and are just as good from the sanitary standpoint as enameled cast iron or the expensive porcelain baths. The ordinary porcelain basin is de-

fective because there is no means of cleaning the overflow pipe. A removable strainer on the overflow is much more desirable. Kitchen sinks of cast iron, steel and porcelain are in common use. The waste pipe from an ordinary kitchen sink should not be more than 1½ in. in diameter and have an ordinary lead trap properly vented to prevent the seal being syphoned out when the rush of water goes down the soil pipe from the closet.

Rule 5 is a wise one, as no refrigerator waste should be connected direct with the plumbing system. During the winter no ice is placed in the box and the water seal of the trap would soon be lost. There is no objection, however, to have the waste water from the refrigerator discharged openly into the kitchen sink or into any plumbing fixture in the basement below, or it may discharge into the trap on the cellar drain. No mention seems to be made in the rules of how cellar drainage should be arranged where it is required.

Rule 6 is intended to prevent contamination of the drinking water in case the water should be turned off in the street main and a partial vacuum thus caused.

Section 16, requiring owners of houses to file in the county registry office plans of the drainage and plumbing of same as executed, seems to be entirely ignored. House plumbing should be constructed so that every detail may be easily examined without a plan, but of course a plan of the outside drainage should be on record somewhere, and if every town had a registry office no better place could be found.

From the foregoing comments the conclusion may be drawn that when the statutes are revised in 1897 some changes and additions are required to bring this portion of the Public Health Act up to date.

#### ILLUSTRATIONS.

RESIDENCE AT SWAN LAKE, OKANAGAN, B. C., FOR JUDGE SPINKS—R. MACKAY FRIPP, F.R.I.B.A., ARCHITECT.

ST. JOHN'S CHURCH, NORWAY—CHAS. J. GIBSON, ARCHITECT, TORONTO.

RESIDENCE FOR ARTHUR THOMPSON, ESQ., GLEN ROAD, ROSEDALE—J. FRANCIS BROWN, ARCHITECT.

A COUNTRY CHURCH—C. J. GIBSON, ARCHITECT, TORONTO.

#### TORONTO'S MUNICIPAL BUILDING.

In a report submitted to the Property Committee of the Toronto City Council a few days ago, Mr. Lennox, architect of the new court house, strongly urged that an iron roof be substituted for the wooden roof shown on the original plan. He pointed out that the building was substantially fire proof, and that a fire could only spread by means of the roof, and that in the event of the timbers becoming ignited, the flames would be uncontrollable at such a height. The character of the neighborhood was, he thought, a great element of danger. He pointed out that iron and fire proof material was fifty per cent. cheaper than when the estimates for the building were prepared.

As to cost, while several plans were proposed, he strongly advised one with steel principals, and beams, and steel rafters, riveted together, and porous terra cotta protection. This, allowing for the reduction in carpenter work by the change, would increase the cost \$27,702. An alternative plan was mentioned, to have the roof of slowly burning construction, by having 3½ inch plank protection instead of terra cotta. This would cost \$18,202.

When the report came up in the committee for consideration it was determined not to make the change, but Mr. Lennox was instructed to report on the cost of a covering of asbestos under the tiles, and also on the cost of iron beams and marble floors in the corridors instead of wood beams and oak floors.

These further facts came out in the discussion: The stone work will cost about \$100,000 over Elliott & Neelon's contract. The plumbing contract, including heating, is the only one not let. Mr. Lennox says he has an offer from one of the largest firms in the city to do it for \$78,000 or \$79,000. All the stone is now on the ground except about \$10,000 worth. About \$200,000 more is required for the work to carry it to completion. According to present estimates the total cost will be \$1,850,000. Mr. Lennox says there will be no extras.