

tags that are imperatively necessary, according to their own views, that never get a screw put into them or even see the necessity for one). I ask what is to keep the connection to closets from breaking when the tanks settle with the walls and the closets remain intact? If this rigid construction is all that is claimed for it, which I doubt, heavy lead bends and traps, or other suitable closet connections flanged into lead safes and soldered, is the only safe and satisfactory manner of setting closets, to my way of thinking. Even admitting that all buildings do settle more or less, the annoyance of coming just right height to floor levels with wrought-iron pipe is one of the most aggravating things connected with its use, either being $1\frac{1}{2}$ inches too low or $1\frac{3}{4}$ too high, more or less above the floor; and to change either involves taking down a whole length of pipe, sending it away to some power machine to be cut off and rethreaded, stopping further progress of the work until it returns, necessitating a delay of half a day or longer, unless you are prepared with suitable tools to cut and thread four-inch wrought-iron pipe, which would be only half the machinery necessary, as I despair of ever educating the present generation of plumbers to even make the attempt to do this by hand power.

Cast-iron pipe with lead bends have a leeway of several inches, which are taken advantage of in coming to floor levels, making it a simple matter to come to floor lines without trouble.

In the matter of expense as compared with cast-iron pipe of the same size, everything else being considered, I believe it is 30 per cent. more costly, and may be 50 as applied to soil-pipe, extra time and fitting being necessary to complete the work. I have had large and extended experience with the use of wrought-iron pipe for drainage purposes all over this country, and while it is a good thing for the purpose, with the exceptions I have mentioned, and makes a tight and satisfactory job, I wish to say, without prejudice to the use of wrought-iron pipe, that I see no reason to substitute it for cast-iron extra strong pipe and fittings. Standard pipe and fittings should not be used anywhere except for vents above highest fixtures and high water levels.

I will say, in conclusion, that I believe good workmanship, honest manufactured cast-iron soil-pipe tested at factory and again in soil-pipe stack with cold water pressure, is good enough work for anybody or anywhere, less than it would be a dangerous piece of work.

TESTING FOUNDATIONS.

THE following simple method of investigating the ground underlying foundations is given by a correspondent of *London Engineering*: Take a worn-out locomotive boiler flue, and cut slots about $\frac{1}{4} \times 6$ inches in a spiral winding around the flue. Then sharpen one end of the flue to a cutting-edge and put a heavy screw-cap on the other end. This cap should be not less than three inches long and solid for 2 inches of its length. In using the testing apparatus drive the flue down with a heavy sledge at the same time turn the pipe with a large chain-tongs. The pipe can be lifted again by a lever or a derrick of portable form. When the tube is withdrawn the character of the material penetrated can be examined through the slots in the sides. A locomotive boiler-flue is generally about 11 feet long, but this is usually sufficient to test the foundations of light structures.

PLUMBING REGULATIONS.

WE have not at hand a copy of the Toronto plumbing by-law owing to the neglect of the proper authorities to send them out to interested parties, and cannot state to what height the plumbing by-law requires that soil pipes should be carried. We do know that it is generally considered necessary that the soil pipe should be carried high enough to discharge above roof, which should mean the highest portion of any roof on the house, and at some distance from windows. Many soil pipes are carried up no higher than a foot or so above the roof of the addition, and far too often finish just below the sill of an attic window. We saw a soil pipe continued in galvanized iron above the roof which is not according to the by-law. The plumbing inspectors should see that the spirit of the by-law is

carried out in respect to the above, and if they consider it is not sufficiently explicit, they should bring the matter before the proper authorities and have the by-law amended. It is most important that the end of all soil pipes should be extended high enough above the roof to allow of the air discharged being carried into the atmosphere and not at a point where it will lie in a solid body and very possibly overflow into some window. The by-law certainly does not allow of any soil pipe being extended by means of galvanized iron pipe, and that has been done on work completed this year. It may be that the inspectors have far too much work to oversee, but that does not excuse them or those over them if bad work is allowed to be done, while the people are under the impression that all plumbing work is being done in the most approved manner.

An Ottawa despatch says representations have recently been made to Hon. John Carling that in future the control of the local health boards should be assumed by the Dominion Government instead of the Provincial Legislatures, and that the Dominion Government should appoint inspectors of cattle for sanitary purposes.

It is impossible to have too much sunlight or fresh air, says a writer in the *Popular Science Monthly*. Every living room and every sleeping room, when possible, should face the south, and the radiant energy of the sun will be found to induce such a healthful and vigorous physiological action of all the organs of the body, that many doctor's and druggist's bills will be saved, and, in a short time, bring about that greatest blessing of life—a state of good health.

A test for the purity of drinking water is given as follows by Professor Angell of the Michigan University: "Dissolve about half a teaspoonful of the purest white sugar in a pint bottle completely full of the water to be tested, and tightly stopp'd; expose it to daylight and a temperature up to 70° Fahr. After a day or two examine, holding the bottle against something black, for floating specks, which will betray the presence of organic matter in considerable proportion."

Modern Light and Heat remarks that the value of real estate for offices in crowded cities has been materially enhanced by the introduction of the incandescent light. The dimly lighted rooms on lower floors, constantly increasing in number as daylight is more and more cut off by new buildings that appear to grow a story in height each year, can be readily let when supplied with incandescent light instead of suffocating gas. The time is not far distant when electric lights will be as much a *sine qua non* in all business buildings as the passenger elevator is to-day.

The Vermont Microscopical Association has just announced that a prize of \$250, given by the Wells & Richardson Co., will be paid to the first discover of a new disease germ. The wonderful discovery by Prof. Koch of the cholera germ, as the cause of cholera, stimulated great research throughout the world and it is believed this liberal prize, will greatly assist in the detection of micro-organisms that are the direct cause of disease and death. All who are interested in the subject and the conditions of this prize, should write to C. Smith Boynton, M.D., Sec'y of the Association, Burlington, Vt.

As a result of the opening of the new C. P. R. short line to New Brunswick, Messrs. Emmons & Fisher, manufacturers of slate mantels, at St. John, hope to develop quite an extensive trade with the Western Provinces.

The contract for the supply of sandstone for the three fronts of the new H'y Morgan & Co. dry goods warehouse has been given to W. McNally & Co., Montreal, the quantity required being over 30,000 cubic feet. The stone is coming from the celebrated "Haytor" English red sandstone quarries, and is of a rich brownish red, even texture and fine grain, and promises to make one of the handsomest business buildings in Montreal.

The North American Mining & Cement Manufacturing Co., of Owen Sound, Ont., have made application to the Deputy Commissioner of Patents at Ottawa, to have annulled the patent granted to Fred. Ransome, of Surrey, Eng., in August 1886, for a cement manufacturing machine, on the ground that the machine was not manufactured in Canada within two years after the issue of the patent. The applicants purchased one of these machines, but had no sooner erected it in Canada than Mr. Ransome demanded a royalty of \$1,000. This the company refuses to pay, for the reasons stated.