diameter they should be made of iron. Their brittleness must be tested as in the case of tiles by letting certain weights fall on them from certain heights. If they are not able to withstand the shock of workmen jumping down unto them, &c., without cracking, they will allow leakage and sewage pollution of the soil.

Brick must be our chief stand-by for large drains and sewers. They must be very hard and impenetrable, not like many of the old second-hand specimens which have been put into some of our Toronto sewers—not many I am glad to say. For the bottom, especially, they must be hard to withstand the grinding and polishing action of the passing solid contents. Their porosity and strength may be tested as with the tiles.

Concrete has been used but not very extensively or with much success.

And lastly we come to the more primitive material *wood*, either in the form of the box drain, or less frequently as fashioned by the coopers' art.

2. THE SHAPE of drains is a very important consideration, and must vary with variations in the amount and character of the fluid which they are intended to convey. So important is the shape of a drain that on it is founded the division of drains into the *deposit sewers* of the olden time, and *self-cleansing* sewers. In old times these sewers used to have to be cleaned out by scavengers, with the same regularity as chimney sweeping. This was due to the fact that the bottoms were broad and flat, and the slow sluggish stream was not sufficient to carry off the solid matters which settled as a deposit, and a deposit once commenced increased by its own impeding action. The same plan is still followed with our box drains, and I might here throw out the suggestion that where box drains have to be used they ought to be set angle down, (and not flat) so as to allow as little surface as possible for the accumulation of deposit, and to give the fluid its greatest possible depth and force.

The best shape for sewers will be *circular* or *ovate*, accord-