SANITARY ENGINEERING.

"SOME SUGGESTIONS ON HOUSE SANITATION."*

THE following schedule shews at a glance the methods the writer would recommend for dealing with domestic and household wastes in different classes of buildings; also the prime cost of connecting with the street sewer and the cost of the necessary plumbing fixtures.

In the majority of cases one house sewer, one outside sink, and one yard hydrant would answer for several houses, thus greatly decreasing cost to each house as here given.

Economical and efficient removal from different classes of buildings.	Cheapest tenements monthly rental not exceeding $5.00.	Houses in which the monthly rental does not exceed $12.00.	Houses in which the monthly rental does not exceed $20.00.	Houses in which the monthly rental does not exceed $40.00.
(a) Liquid house wastes.				
1. Kitchen water (fatty)	Slopsink outside the building	1 Kitchen sink	1 Kitchen sink	1 Sinks.
2. Washing " (soapy)		2 " "	2 " "	2 Baths, wash-bowls & sink
3. Chamber slops		3 Slop sink outside.	3 Water closet	3 Water closets
(b) Night soil	Earth or ash closet.	Earth or ash closet.	Water closet.	Water closets
(c) Kitchen garbage	Burned in kitchen stove in whole or in part.			
(d) Ashes	Carted away as often as possible with the refuse that cannot be consumed.			
(e) Subsoil water	Removed by porous agricultural drain tiles.			
Cost of house sewer	$18 00	$18 00	$10 00	$10 00
" plumbing fixtures	$12 00	37 00	125 00	180 00
Total first cost	$30 00	$ 55 00	$135 00	$190 00

In houses indicated in the second and third columns of the above schedule the annual cost for odorless excavating and for removal of garbage and surplus ashes should not exceed $2.50 per year. In houses of the class mentioned in the last two columns there will be the additional charge for extra water required to flush the water closets, and other fixtures.

The cost of house sewer does not include the cost of that part of house sewer between the street line and the street sewer.

We will now describe the fixtures mentioned.

THE OUTSIDE SLOP SINK.

This slop sink should be of iron, preferably galvanized, and should have a cast iron outlet pipe 3 inches in diameter furnished with a deep trap of the same diameter placed from 3 to 4 feet below the surface of the ground (beyond the effect of frost). The ordinary "Merry Sink," 21½ inches long, 17 inches wide and 9 inches deep, to be had from all dealers in sanitary fixtures and illustrated in Fig. 1, answers admirably as it has no corners within that can retain dirt or filth, and the screen over outlet is large and

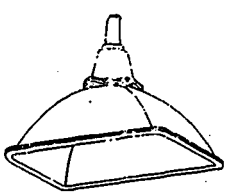

FIG. 1.

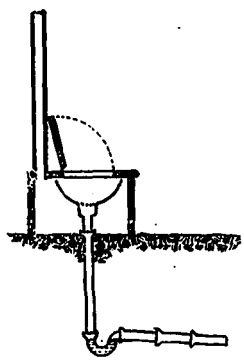

FIG. 2.

exactly suited for use required. This sink should be covered with a strong box of wood with hinged cover to protect the sink from injury. This box and enclosed sink should be ventilated by boring several holes through the box near the surface of the ground and by carrying a ventilating shaft of wood or sheet metal from the top of the box to some convenient height above the ground away from windows. This sink should be thoroughly and frequently scrubbed, and to prevent improper use of sink the screen or strainer placed over the outlet must be permanently fixed.

Unless kept scrupulously clean this outside slop sink should not be placed in any building or shed, but it may be placed at one side of an outside building; the ventilating shaft being carried up the side of the building. A roof may be built over the fixture if desired.

If roof water is permitted to enter the sewer system it would be advisable to allow one rain water leader at least to discharge into this sink.

The yard hydrant for water supply should be located so that drip and water can be readily conveyed to this slop hopper.

THE DRY EARTH OR ASH CLOSET.

"The dry earth or ash closet used for the "treatment" of night soil should be built according to the 'Brantford' plan. Fig. 3 shows the style of closet generally used in Brantford, where there are now about 1,300 in use. Movable drawers, boxes or pails are not used, because in this climate a little moisture freezing in winter makes their removal or emptying difficult. The box is therefore fixed and can generally be arranged so as to be emptied with a shovel by a door or lid in the rear, as shown in the figure.

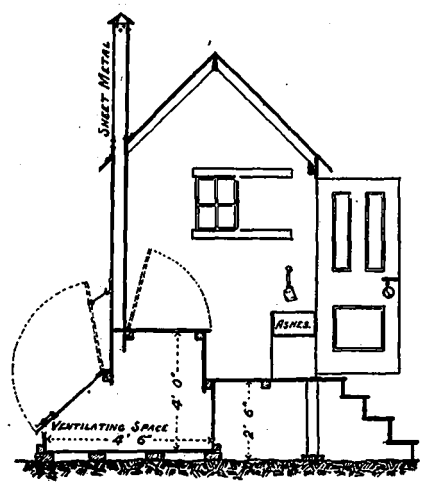

FIG. 3.

The boxes are made of lumber. A moderately tight box, not sunk in the ground, where no slops are thrown in, good ventilation provided, and a little dry earth or coal ashes thrown in at each use, or even once daily, will not become offensive and will last for half a lifetime. This closet is very cheap. Old privies can easily be changed into ash closets by emptying and cleaning the pits and filling them with clean earth, then raising the structure about two feet, placing the box under and providing a couple of steps. In many places in Brantford they are built under back sheds, etc., with access from the house.

An ample box should be provided within the closet for the coal ashes or dry earth, also a convenient scoop or dish for their application. Dry earth (top soil, never sand) is assumed to be the proper application, but in practice it is little used, being not ready to hand as the coal ashes usually are, and being often not dry. The coal ashes should be kept under cover, they need not be sifted. Wood ashes in practice are found to be offensive. In the public schools in Brantford a shovelful of coal ashes is thrown down each opening once a day by the janitor after the school is closed, and after six years' experience these school closets are proved to be as inoffensive as the best arranged water closets.

These ash closets make no provision for liquid refuse, and it is imperative that no chamber slops or kitchen refuse should be thrown into them. The disposal of such liquid fluid should be by the outside slop sinks connected with drains or sewers. Where there are no such drains or sewers the disposal of such liquid refuse is, in crowded neighborhoods, a difficult problem, and it is not the purpose of this paper to speak of the many expedients resorted to for solving it.

The dry ash closets should be emptied once a month for an ordinary family service or for schools. In other cases a more frequent service may be necessary.

The cost of a monthly service is in Brantford $1.80 per annum. The average distance to the dumping ground being about 1½ miles. One man with a one-horse cart easily attends to 600 closets. It is absolutely necessary that a systematic and efficient contract service be provided.

It may be added that while serious difficulties exist in providing dumping grounds for the contents of privy pits and cesspools, no difficulty whatever has arisen as to the dumping of contents of dry ash closets, such being readily disposed of upon market gardens.

In those of our cities already well provided with sewers, thousands of noisome privy pits still exist. (There are over 12,000 in the city of Toronto.) The expense of introducing water closets in the cheaper tenements, the want of a suitable place to locate them where they would not be affected by frost, and the additional water rates required for flushing them, prevent their erection in such tenements. The systematic introduction of dry ash closets in these cases in conjunction with the outside slop sinks offers an effectual means of abating this widespread and dangerous nuisance."

GARBAGE.

Combustible garbage can be burned in the kitchen stove, and the ashes

* Abstract of a paper prepared for the Association of Health Officers of Ontario, by Willis Chipman, C. E.