liquid, which is so foul that it cannot be discharged without treatment, but if pumped over into the sedimentation tank would certainly tend to start septic action there.

Dr. Arthur Lederer, chemist of the Chicago sanitary district, stated that "There has never been a hydrogen sulphide odor noted in the effluent in any of the septic tanks of the sewage testing station of the sanitary district, not even during the hot season, when the evolution of gas was at its highest. The supernatant liquid of the sludge digesting chamber of the Emscher tank, while giving no hydrogen sulphide odor, gave a positive reaction for hydrogen sulphide."

A small disposal plant at Kings Park, N.Y., was referred to by Geo. W. Fuller, which has now been operating for several months. This plant treats the sewage of a population of between 3,000 and 4,000 people. The preliminary treatment consists of plain sedimentation in tanks of the Dortmund type. From the bottom of the tanks the unputrefied sludge is removed at intervals by opening a gate on the outlet pipe, through which the fresh sludge, by the weight of the superincumbent sewage, is forced to long covered sludge trenches. These trenches are about 6 feet deep and 6 feet wide, braced on the sides and top with rough lumber and covered with a foot or more of sandy soil. The sludge is distributed lengthwise in these trenches by means of a trough, so that it can be deposited at different points by adjustments made through openings which are ordinarily covered. There is an overflow pipe to take the liquid, if necessary, when the trench is filled, to the final settling basin into which the effluent from the sprinkling filters passes. Such liquid as does not percolate into the porous soil may be treated with hypochlorite of lime as it flows into the final settling basin.

The only feature suggesting modification in the preliminary treatment at the Kings Park plant is the formation of scum on the surface of the clarified sewage in the Dortmund tanks. This is largely due to the fresh and but partially screened sewage entering the Dortmund tank and probably would also appear in an Emscher tank. The sewage seems to be unusually well clarified at the Kings Park plant and is delivered to the sprinkling filters in a fresh condition. The covered sludge trenches, it is believed, will afford a disposal of the sludge without odors at a very small or moderate cost for construction and at practically no expense for operation for several years. The opening of a valve now and then is all that is required of the attendant, who need visit the plant only for a few minutes once or twice a day. Ultimately it will be necessary either to dig out the sludge from the existing trenches, or to build new ones. The writer is by no means certain that with either or both of these operations the separate covered sludge trench, or basin, is not cheaper for a plant of this size for some locations than is an Emscher tank, with its sludge beds which are supposed to need attention at such frequent intervals as to require the regular employment of a laborer.

BRITISH STANDARD FOR REINFORCED CONCRETE CONSTRUCTION.

(Concluded.)

Jointed circular hoops as ordinarily made are apparently not quite so efficient.

Rectilinear ties are still less adapted to resist the lateral or radial expansion of a highly stressed core.

The volume of curvilinear laterals should never be less than 0.5 per cent. of the volume of hooped core.

The diameter of rectilinear laterals should not be less than three-sixteenths of an inch.

Strength.

The amount of the increase of strength in hooped pillars depends upon:

1. The form of hooping (whether curvilinear or rectilinear, etc.).
2. The spacing or distance between the hoops.
3. The quantity of hooping relative to the quantity of concrete in the core of the pillar.
4. The quality of the concrete.

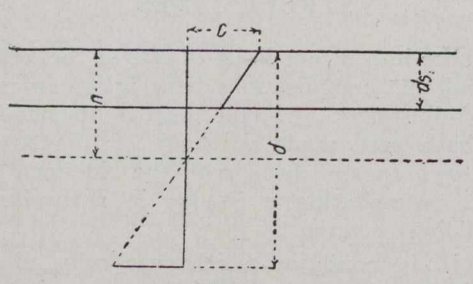

Fig. 2.

Consequently the increase of strength may be shown to be equal to the product of the four factors (u. f. s. r.)

u = the ultimate compressive stress on concrete not hooped (per unit of area).

f = a form factor or constant which will vary according to whether the hooping is curvilinear or rectilinear, etc.

s = Spacing factor or constant which will vary with the pitch of the laterals.

Vh = Volume of hooped reinforcement in cubic inches.

V = Volume of hooped core in cubic inches.

r = Vh/V = the ratio of volumes—i. e., the ratio of the volume of helical or horizontal reinforcement to the volume of hooped core.

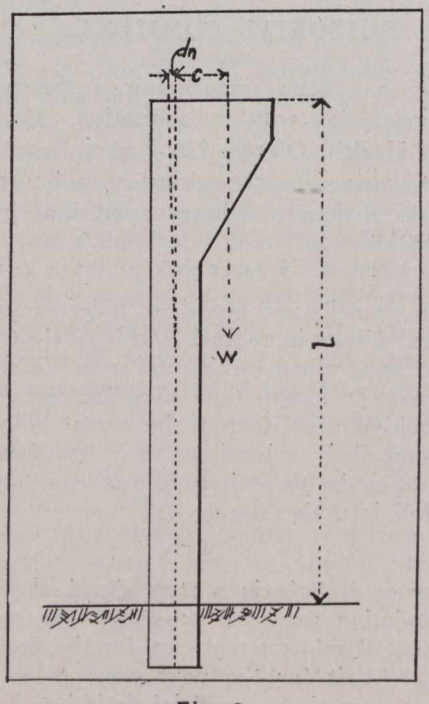

Fig. 3.

The ultimate compressive stress on concrete not hooped being = u, and the increase of strength due to hooping being

u. f. s. r.