

## MUNICIPAL DEPARTMENT

### SEWAGE DISPOSAL BY BACTERIA BEDS AND THE SEPTIC TANK.

(Continued.)

The permanent plant for this place, designed to treat 960,000 gallons daily, has coarse beds of 4,500 square feet area and 3 feet of burnt ballast retained on a half-inch sieve, and fine beds, for the second treatment, of 4,950 square feet area and 3 feet of burnt ballast which has passed a half-inch sieve, but has been freed of fine dust. The beds were constructed by puddling the bottom and sides of an excavation, and laying agricultural drains on the bottom, which discharge into an outlet pipe controlled by a valve. The cost of the beds was \$1,600.

In introducing these bacteria beds where chemical precipitation has previously been employed to effect the clarification of the sewage, the advice given by Mr. Thudichum is to utilize the precipitation tanks as sand catchers and coarse beds. For the latter purpose a system of drains is laid on the floors, and the basins filled with burnt ballast, coke or other suitable material. Fine beds can be constructed as already indicated, and the effluent from these run over the land of the farm when the crops need to be irrigated, or discharged into the river at other times. "The immediate benefits," he says, "derived from such a conversion of the method of treatment are well marked, the use of chemicals is abandoned, saving the cost of both materials and labor. The collection and subsequent treatment of sludge is abolished, since there is no sludge, merely a small quantity of rags, paper and similar matter collected by the screens, and amounting in ordinary cases to about 30 barrow loads per million imperial gallons, the sludge item also making a marked difference in the working cost. \* \* \* The Sutton works themselves form a typical instance of the advantage of conversion. By the time the alterations are completed the whole cost will have been less than \$10,000, while the annual saving in working expenses already or to be effected amounts to no less than \$2,500, or about 16 cents per head of population."

It is interesting to notice that the author, who is associated with Mr. W. J. Dibdin in the introduction of the Sutton process, says there are a number of features of this system which can be clearly determined only by the co-operation of engineers. Among them are the questions relating to intercepting the sand in the sewage, the working life of the coarse beds and the fineness of the screens. The last does not arise in connection with the septic tank, as all organic matter enters it. The sand question remains, however, and the life of the final bed remains to be studied, for the effluent

from the septic tank at Exeter contains considerably more suspended organic matter than that from a coarse bacteria bed.

The useful life of these coarse beds has not yet been determined. That first built in Sutton, which has been in service over two years, is stated to be in excellent condition still and giving as good results as those obtained after it had been in operation a couple of months. There is reason to believe, however, that the water capacity of a bed diminishes according to the time it has been in continuous service, increasing after each period of rest, but never equalling that of the bed in its early stages. A considerable part of this loss in capacity is attributed to organic growths in the interstices of the bed, which, indeed, must develop to a certain extent before the full purifying powers of the bed are obtained. But there must also be a quantity of mineral matter from the sewage deposited in the bed, much of which can never be brought into solution and thus carried away with the effluent.

The interception of the sand in the sewage before it reaches the beds is a subject closely connected with their life. Where cities have the separate system of sewerage it is not very important, but where street washings pass through the sewers to the disposal works the subject requires careful attention. At the Park- ing outfall works of London there are thousands of tons of road sand which have been removed from the precipitation channels, where it settled as soon as the velocity of the sewage was checked. Several hundred tons of such sand is brought down after a heavy storm following a period of drought. This sewage-carried detritus should not be allowed to pass to a bacteria bed, as it would become choked in a short time, and the question to be solved is to what rate must the flow of sewage be reduced, or how long must it remain quiescent in settling tanks in order that the sand may settle to the bottom and the organic matter in suspension still remain in the sewage. Too short a period will allow sand to enter the bacteria bed, and too long a period will permit the subsidence of the suspended organic matter and the production of sludge. In the Sutton system, the life of a fine-grain bed is not affected by these considerations. The effluent from the coarse bed contains only a small amount of suspended solids, chiefly organic, and

the fine bed will not become silted, although its water absorbing capacity will be somewhat reduced by the organic growths which must develop.

So far as the labor required by this method of disposal is concerned, night attendance has been dispensed with in many recent cases by providing a pair of beds, coarse and fine, each having a water capacity sufficient to take the whole of the night flow. Syphons are provided, so that in case the level of the water in the bed exceeds the definite height, because of rain or some other cause, there is an automatic discharge from the coarse bed to the fine or the fine bed to the farm land, as the case may be.

(To be Continued.)

### GOOD ROADS MEETING.

The annual meeting of the Good Roads Association of the District of Bedford was held at Sweetsburg, Que., on January 6th. The principal addresses were made by the president, Hon. W. W. Lynch, Hon. S. A. Fisher, Mr. A. W. Campbell, Ontario Road Commissioner, and Mr. J. A. Camirand, Sherbrooke.

Mr. Campbell was especially interesting and instructive in his address. Hon. Mr. Fisher, who followed him, stated that had he had any idea beforehand of its being so important he would have made arrangements to have it reported verbatim and printed for general distribution by the department. Mr. Fisher made the important announcement that if any municipality would arrange for a meeting of all its road inspectors he would have a practical man sent to instruct them in the principles of road making. Mr. J. Bruce, on behalf of the township of Granby, immediately accepted Mr. Fisher's offer. Other speakers were H. G. Foster, Hon. J. C. McCorkill, J. C. Draper, J. J. Mullin, E. A. Dyer, N. P. Emerson, Colonel Patten, and Colonel Amyrauld etc.

It is probable that a Good Roads' picnic will be held at Granby next summer.

The old officers of the association were re-elected, though Judge Lynch wished to retire from the presidency. He submitted, however, to the wishes of the members and will remain another year.

The nineteenth annual convention of the American Water Works Association will take place at Columbus, Ohio, on May 16, 17, 18 and 19. J. O'Shaughnessy, superintendent of water works of Columbus, Ohio, is chairman of the local committee of arrangements.

## Portland Cements...

HIGH GRADE GERMAN BRANDS FOR GRANOLITHIC  
AND ARTIFICIAL STONE SIDEWALKS.

**Sewer Pipes,** Best English Cements. Best Belgian Cements.  
**Culvert Pipes, &c.** **W. McNALLY & CO., Montreal**

**BELLHOUSE, DILLON & CO., 30 St. Francois Xavier St., Montreal**  
Sole Agents for the Compagnie Generale des Asphaltes de France (Rock Asphalt).

**PORTLAND CEMENT NORTH'S CONDOR**

Paving and Fire Brick a Specialty

SITTING LION and WHITE CROSS BRAND

NORTH'S "CONDOR" BRAND AWARDED FIRST PRIZE AND GOLD MEDAL AT THE ANTWERP EXHIBITION