

ewers and house connections, in all about miles, takes fifteen minutes.

"In the matter of house connections here is very little difference between those of the Liernur system and those of the water carriage and gravitation system. The Liernur house-fall or syphon-box is said to be a great improvement upon the existing models. It is at once a syphon, a seal, an intercepting and inspection chamber, and it also allows of the cutting-off of any house from the general system. This box, which is of cast-iron, and hermetically sealed, is placed in the most suitable position to enable the sewage from various water-closets, sinks, etc., to be discharged into it, and also to secure for the house connections as much as possible the benefit of the air-flush which enters the air inlet immediately above the box. The contents of this syphon-box are being constantly displaced by pressure, which is facilitated by the partial vacuum at the station. It is claimed that no contamination of the air by sewer gases, etc., is possible, the whole network of sewers being airtight. Noxious gases are drawn to the pumping station, and from thence carried to the retorts of the gasworks adjoining, and passed through the fires.

"It is stated that a saving in construction is affected, compared with the ordinary sewerage systems, by the small amount of excavation required, the absence of flushing chambers, manholes, ventilating columns, etc., and the small diameter of the pipes laid down.

"The economy in working expenses arises mainly from the fact that at the pumping station the quantity of sewage received is kept at the lowest possible limit for discharging into the high level gravitation sewer, and this is effected without prohibiting the use of water for flushing the closets, sinks, etc. Stoppages are said to be infrequent, and can soon be remedied and at little cost. No fall or incline of the ground is necessary for this system, but is used where available.

"As to the cost of the installation at Stansted, the figures given by the secretary of the English syndicate show that the actual capital cost is below £2 per head for 1,000 people, that number being now actually connected to the system at Stansted. The present installation will serve three times the population, and the actual plant at the pumping station would serve probably six times. They are able to draw the whole of the sewer gases to the pumping station, and there burn them, and also by the same means ventilate and purify the sewage tank, which adjoins the pumping station.

As to the working expenses, the actual cost comes out between 10d. and 1s. per head per annum, including lifting the total sewage 35 ft. to high-level sewer. The cost of one suction for cleaning the whole of the sewers and house connections, removing deposits, sewage, noxious gases, etc., in all works out at 10d., that is 10d. for cleaning out nearly 2 miles of sewer pipes. This figure of 10d. includes the cost of collecting the sewage and of its discharge on the irrigation fields.

"The machinery is fairly simple, and consists of the following: A boiler plate vacuum reservoir (with a capacity of about

2,800 imp. gal.), a gas engine, 8 h.p., a vacuum pump of three-quarters h.p., and a lifting pump, for pumping the sewage to the high-level sewer. Adjoining the pumping station is the storage tank, with a capacity of 30,000 gal., which represents the quantity of sewage estimated to be delivered in three days.

"The Liernur system of collection assists in the final disposal by delivering at the works a sewage which has been thoroughly broken up by the violence of its conveyance. It must be undoubtedly a great factor in the successful disposal of sewage, whatever method may be employed, bacterial, chemical, or treatment over land, if a sanitary committee and their engineer can depend on the unvarying quantity and quality of the sewage delivered at the outfall, and these advantages seemed to be secured by the Liernur pneumatic sewerage system.

"The sewage having been pumped into the high-level sewer is conveyed by gravitation to the sewage farm, 1 mile southwest of the village; the land covers an area of about 3 acres, and has a subsoil of light loam and gravel; mangels and osiers are grown, £50 per annum having been obtained in one year by the sale of the former. The effluent is conveyed on to a pasture about 5 ft. above water-level,

ultimately finding its way into the river Lea."—Engineering Record.

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(Continued on page 14.)

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