MUNICIPAL DEPARTMENT

MICRO-ORGANISNS OF SEWAGE.

THE Main Drainage Committee of the London County Council recently brought up the following report in reference to this subject: "In accordance with the authority given by the Council on January 23, 1894, the services of Mr. J. Parry Laws and Dr. Andrews were retained for the purpose of making investigations into the bacteriology of sewage, and their report of the result has now been laid before us. These investigations, the Council may remember, were undertaken in order to obtain corroborative evidence as to the conclusions arrived at in previous reports by Mr. Laws on the micro-organisms of sewage air. In those reports it was shown the bacteria of sewer air related were to and derived from those of the fresh air, and not from those of the sewage, and there was no evidence that sewage was able directly to give up its organisms to sewer air. For greater convenience the present report is divided into two parts—the one dealing with the micro-organisms of sewage and their relation to those of sewer air, and the other containing observations on the bacillus of typhoid fever and its relation to sewage. The latter investigations confirm in a most striking manner the conclusions arrived at from the previous experiments on sewer air. If the organisms existing in sewer air were derived from those existing in sewage the bacteria of sewer air should bear a close resemblance to the bacteria of sewage. On contrasting the prevailing organisms of sewage with those of sewer air, they are found to bear no resemblance whatever to one another; indeed, so far as the authors are aware, not a single colony of any of the organisms found to predominate in sewage has so far been isolated from sewer air. Attention was also specially directed to the possible occurrence of the typhoid fever bacillus and the diphtheria bacillus in ordinary London sewage. Therefore every colony which seemed likely to belong to either of these species was the subject of careful investigation. No evidence, however, of their occurrence in ordinary sewage was found. It is pointed out that the failure to find these organisms in ordinary sewage no doubt arises from the fact that the infected material constitutes such a minute proportion of the total bulk of sewage discharged by the sewers. The mathematical chances, therefore, of detecting these organisms are exceedingly minute unless they are capable of vigorous growth and multiplication. Realizing this fact, search was made for the typhoid bacillus in sewers where it might be expected to exist in much larger proportion. On examining sewage taken from the sewer draining the fever block at the Eastern Hospital, after disinfection had been discontinued for a short period, the existence of the typhoid bacillus was satisfactorily shown—an important fact which has not hitherto been demonstrated. A series of experiments was also made to determine the fate of the typhoid bacillus in sewage, in order to verify or disprove the statement made by many writers that disease germs, such as the typhoid bacillus, find in sewage a suitable soil for their growth and multiplication. On careful investigation it has been found that the bacillus of typhoid fever is not only incapable of any growth and multiplication in sewage, but that after the first 24 hours it slowly and surely dies out, its ultimate death under natural conditions being a matter of a few days, or at most one or two weeks. If the organisms which exist in overwhelming numbers in sewage do not exist in sewer air, how indefinitely remote is the possibility of the existence of the typhoid fever bacillus in the air of the sewers. Sewage is without doubt a common medium for the dissemination of typhoid fever; sewage-polluted soil may give up germs to the subsoil air; but from the results of these investigations it appears in the highest degree unlikely that the air of the sewers should play any part in the conveyance of typhoid fever."

COMBINED ELECTRIC LIGHT AND WATER WORKS.

A rather interesting departure has been made at St. Lazarus, near Posen, Germany. The town has some 3000 inhabitants, and the novelty consists in the combination of electric and water works with excellent results. Having discovered by means of boring operations that there was plenty of water in the sub-soil, the local authority thought fit to ask for tenders for combined works of the nature indicated, the result being that the Helios Company, of Cologne-Ehrenfeld, were entrusted with the contract. The installation, as described recently by Mr. Luhn, of Berlin, to the Electrotechnical Society of Cologne, comprises four sections - the boiler house, engine room, pumping shaft and accumulator room. The boiler house contains two Cornish boilers fitted with Galloway tubes and working at 90 lbs. pressure. One boiler is sufficient for the operation of the electrical and pumping plant, the other being kept as reserve. Space is available for the accommodation of a third boiler, which is to be put down this spring. A heater is provided for heating the feed water, which is supplied to the boilers by a Worthington pump. Near the boiler house is situated the engine room, in the corner of which is the pumping shaft, 20 feet deep and 17 feet in diameter. Two pumps are arranged at the bottom of this shaft. One is a compound steam pump, while the other is driven by an electric motor by means of toothed gearing. The engine room contains a 50 horse power steam engine running at 190 revolutions, and driving a dynamo by belt. Two air compressors operated by electricity are arranged on each side of the pumping shaft, the object of these being to increase the pressure of the air contained in two reservoirs. The accumulator room contains a battery of 136 cells capable of supplying 200 16-c.p. lamps for seven hours. A feeder is carried from the generating station to the distributing centre, where the mains are laid on the three-wire system for private consumers, whilst a separate circuit is provided for the street arc lamps. All the conductors are carried overhead on porcelain insulators fixed to wooden posts 26 feet high.

The operation of the station is as follows:—During the day when the consumption of water is comparatively great, the battery is charged and the demand for water is met by the steam pump. When the charging of the battery has been accomplished, and in case in the morning before firing up a greater demand for water should arise, the work is carried on by the electric pump with the assistance of the battery. At twilight the current is supplied by the dynamo, and at 11 p.m., according as the street arc lamps are switched off, the machinery is shut down and the battery takes over the supply. In the case of a fire breaking out in the town the electric pump and one of the compressors are brought into use, this being regarded as of great importance. The automatic arrangements adopted throughout the works have reduced the number of attendants, only one engineer and one boiler attendant being required. The disposition of the station has rendered it possible to supply electrical energy at the rate of 3¼ per unit. Another installation on the same plan has been carried out at the neighboring town of Wilda.

PERSONAL.

Mr. Henry Carswell, who for the past thirty years has held the position of Treasurer of the town of Oshawa, Ont., died on the 20th of March.

Mr. Wm. Murdock, C.E., has been appointed to the new office of City Engineer and Superintendent of Sewerage and Water Supply of St. John, N. B. The separate offices of City Engineer and of Superintendent of Sewerage and Water Supply, formerly held by Mr. Hurd Peter and the late Gilbert Murdock respectively, have been abolished.

One feature about the house drainage in Berlin, rendered necessary no doubt by the frost, is that no disconnecting trap exists between the sewer and the house drain, a flap valve having all the responsibility thrown on it of excluding sewer air. The soil pipes, therefore, act probably as exceedingly good sewer ventilators. The soil pipe is hardly ever outside the house, and there is no through ventilation except from the sewer.

The City Engineer of Toronto estimates the cost of laying brick pavements as follows: "For a brick pavement on a four-foot concrete foundation, $2 per square yard; for a brick pavement on a foundation of building brick laid flat, $1.80 per square yard; for a brick pavement on a broken stone foundation, properly rolled, $1.75; for a brick pavement on a gravel foundation, properly rolled, $1.65. These figures are based on the prices that have been hitherto paid for bricks.