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FERTILIZER FROM SEWAGE SLUDGE

ORGANIC suspended matter in sewage is conserved by the activated sludge process. By dewatering the sludge it can be converted into a valuable fertilizer. This was demonstrated fully by Col. Nasmith's experiments, described in our issue of May 2nd, 1918. In editorial comment published in that issue it was said:—

"It now remains for someone to solve the problem of dewatering activated sludge, in order to make its use commercially feasible. With the world's growing knowledge of the chemistry of colloids, the solution of the dewatering problem may not be far distant."

Since the publication of the above-mentioned article there has been received the fourth annual report of the Sewerage Commission of the city of Milwaukee, Wisconsin, in which is recorded experiments in the reduction of sludge to fertilizer by means of preliminary and secondary sedimentation, pressing and drying.

The liquors in the aeration tanks contain suspended matter and water in mixtures varying from 99.4 to 99.8 per cent. of moisture. By passing the liquors through settling tanks, the moisture was reduced to 96 per cent. or slightly less. Sulphuric acid mixed with sludge tends to dehydrate the sludge if the mixture is heated. Settled sludge containing about 98 per cent. moisture was dewatered in 2 1/4 hours to 91 per cent. by the acid process, but the expense is said to be \$2.00 per million gallons of sewage treated.

Experiments made last summer in pressing sludge in a Worthington Press and in a Simplex Plate Press

showed that the moisture can thus be reduced to 80 per cent. or a little less. But press cake carrying 75 to 80 per cent. of water cannot be sold as fertilizer. It must be dried to 10 per cent. of moisture.

During 1917 the Milwaukee commissioners dried several tons of press cake in a small, experimental, semi-direct heater. The fertilizer obtained carried 4 to 18 per cent. moisture. Experiments, it is announced, had previously been tried with an indirect dryer, obtaining fertilizer with from 4 to 10 per cent. moisture. This latter product had a good value as plant food and was produced without creating a bad odor or nuisance from dust. The semi-direct heater was not provided with suitable gas cleansing apparatus, therefore objectionable odors escaped. By washing and burning the gases, as is done by some packing houses and other manufacturers of fertilizers, or by mixing with the gases the fumes of burning creosote and then discharging the mixture into the stream of sewage about to undergo purification, it is thought that odors could be avoided sufficiently to permit the successful use of semi-direct heaters.

Tests of the dried fertilizer showed that it contained 4.4 per cent. of nitrogen, figured as ammonia, on a basis of 10 per cent. moisture. These results are very satisfactory if they have been economically successful. Unfortunately, the Commission gives no idea of the cost of the whole process as compared with the commercial value of the product. We would suggest that an accurate account of costs be kept in future experiments and that a balance sheet be included in the next annual report, showing income from sale of fertilizer, cost of its production and profit and loss. Of course, such a balance sheet would be fair to the process only in case the experiments be enlarged upon a commercial scale. A balance sheet covering operations with a small, experimental plant would be of little value as a criterion of the practicability of the scheme's commercial application.

Milwaukee has been a leader in experiments with activated sludge. Sewage disposal owes much to T. Chalkley Hatton and the other engineers associated with him. It is to be hoped that they can obtain sufficient funds from the Commission to undertake upon a small commercial scale the manufacture of fertilizer from activated sludge. If they could make such an undertaking a practical success, the world of science would be still further indebted to them.

CENTRAL EMPLOYMENT SERVICE

SHORTAGE of man-power in war industries, aggravated by an almost universal practice of labor stealing and poaching, has necessitated drastic innovations in the United States in order to protect both employers and employees, to lessen unnecessary and expensive turnovers, and to increase the production of essentials.

The United States War Labor Policies Board, with the approval of President Wilson, has centralized in the United States Employment Service of the Department of Labor all problems relating to the supply of common labor. Independent recruiting of unskilled workmen by manufacturers employing more than 100 men can no longer be generally done, although there are certain exempted cases. Labor must be recruited with the knowledge and co-operation of the United States Employment Service, in order to prevent any community from being drained of labor, and in order to use local supply so far