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BETTER OPERATION FOR
IOWA SEWAGE-TREATMENT PLANTS

BY HANS V. PEDERSEN

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CONFERENCES on sewage treatment are held annually at Iowa State College under the auspices of the Engineering Extension Department. These meetings are of a practical nature and are arranged for municipal officials and all others directly or indirectly responsible for the operation of sewage-treatment plants.

This publication is one of the more general papers that were presented at the 1925 conference; others are to be published. In addition to that given to formal papers, considerable time on the program was devoted to the consideration of sewage-treatment plant construction and operation, as well as to the individual problems of those in attendance.

BETTER OPERATION FOR IOWA SEWAGE-TREATMENT PLANTS

BY HANS V. PEDERSEN

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The State Department of Health of Iowa has just completed a survey of all the cities and towns in the twenty-six counties that constitute the major portion of the Iowa and Cedar river valleys. Out of the 222 municipalities located in this area, 81 have sanitary sewer systems. Of those having sanitary sewer systems, 24 dispose of their sewage by dilution, that is, by discharging it directly into a stream of water. The rest of these municipalities (a total of 57) purify their sewage to some degree by means of some type of sewage treatment before discharging it into near-by water sources.

Condition of Sewage-Treatment Plants

It is interesting to note that out of the 57 sewage-treatment plants investigated, 31 were reported as being in very bad shape due to a lack of proper attention. There were very few reported as working at maximum efficiency. Most of the sewage-tank trouble was laid to the presence of too much sludge in the digestion chamber. Some of the troubles reported in connection with the sand beds were growths of weeds, deep plowing with horse power, replacement of filter sand with a dirty non-uniform pit-run sand, overloading as a result of a high rate of infiltration into the sewers, and failure to repair the distribution system. Some of the filter beds were by-passed entirely, because the siphons were out of order.

Causes of Poor Plant Operation

There are two reasons why there are so many poorly-operated municipal sewage-treatment plants in Iowa. The first reason is that the average city or town council fails to realize the necessity of providing a competent, intelligent, and industrious plant operator to perform certain fundamental duties at the right time and in the right way; and the second reason is that the average council fails to provide yearly a sufficient repair and replacement fund.

Theoretically, the town council or governing group should be elected to office to look after the welfare of the community, and to act as guardians of the public health. It should provide a safe and palatable public water-supply, as well as install and maintain adequate methods of collecting and disposing of sewage, garbage, and filth. In other words, a governing council should keep the community clean and sanitary and promote such conditions as will make that community a healthful place in which to live.

Oftentimes, however, the purposes for which city and town councils should be elected seem to have been lost sight of. The majority of voters go to the polls today with just one purpose in mind, and that is to elect councilmen who will reduce the city's expense and thereby reduce the personal taxes of the voters. An individual looks at the record of the last council. He remembers how he voted for men who had promised to lower taxes. But what did they do? Nothing. The average voter in the smaller community reasons that, because of the failure on the part of the last council to reduce taxes, he must have been mistaken in his judgment of men; and so he goes to the polls the next time and casts his vote for an entirely new group, hoping and trusting that he has at last elected a group of honest men of such marvelous ability as to be able to run the city's business better than ever before without spending nearly as much.

And so it is that every city election brings forth new councilmen, and the new inexperienced council is forced to begin work, not where the old council left off, but practically where the old council started.

Economy Often Costly

It is natural to expect that a council elected under such conditions would seek every opportunity to save money. Unnecessary expenditure of money should be as foreign in cities as an Eskimo is in Florida, but oftentimes a new council in its effort to reduce taxes fails to distinguish between necessary and unnecessary expenditures. The majority of such mistakes are generally rectified with little or no damage, but sometimes a council wakes up too late and finds that because it failed to spend a small sum of money at the right time, it is forced to spend a much larger sum or to take the chance of losing an entire investment.

Care and Maintenance Necessary. New councils as a rule underestimate the necessity of providing a definite sum of money to keep the municipal sewage-treatment plant in repair and to pay for the necessary care. In the first place, sewage-treatment plants are not very well understood. Many people have the idea that such plants are supposed to be automatic, or that they will take care of themselves if let alone. Some people regard them as institutions of mys-

tery—things that should not be interfered with for fear of unknown consequences. A reason once given for permitting a plant to take care of itself too long was that no one on the council knew what to do, so they did nothing for fear they might spoil something. Lack of information or the failure to provide a competent care-taker has ruined many a good sewage-treatment plant in Iowa.

A Business Problem. But what is to be done about correcting such a state of affairs? Is it expedient or good business on the part of the people of the state to sit idly by and let a perfectly good sewage-treatment plant that cost the various communities from twenty-five thousand to two hundred thousand dollars become inoperative or entirely out of commission in a short period of time? A well-designed sewage-treatment plant adequate for a small community, if properly cared for, should last a lifetime with very little expense outside of the salary of the operator. Which is really better, then, to provide a competent caretaker from year to year, or to dispense with the caretaker and practically rebuild the plant at the end of ten years?

Three Suggestions

With a view to the prevention in the future of unnecessary expenditures of money due to such ignorance and misunderstandings as to the needs of municipal sewage-treatment plants, the following suggestions are offered:

(1) **Licensed Operators.** It is proposed that a state law be passed requiring every city or town having a municipal sewage-treatment plant to employ a licensed operator to look after the plant. Such a license should be granted by the State Department of Health after the applicant is thoroughly informed as to his several duties; it should be granted either upon a written or an oral examination. A suggested qualification for the right to take such an examination is that the applicant must attend two conferences of sewage-treatment plant operators as held under the auspices of the Engineering Extension Department of the Iowa State College at Ames.

A licensed operator is suggested for the reason that this will prevent new councils from removing a competent operator for political reasons and placing a man in charge who does not understand the workings of a treatment plant. There will undoubtedly be objections to the licensing of such operators, due to petty reasons and fears, chief among which would probably be the fear that this licensing would tend to increase the salaries of operators. In spite of all objections, however, if it is necessary to install sewage-treatment plants in the first place, it is certainly necessary that they

function properly; and the best way to assure good operation is to provide competent men to look after them. The most effective way to assure competent operators is to require that they be licensed.

(2) **Weekly Reports.** It is proposed that each operator be required to fill in a weekly report card as furnished by the State Department of Health, giving a record of just what work has been performed on the plant during that week.

The weekly report card will indicate to a large extent whether the operator is really competent and is really performing his duties in a systematic way. The report card could not take the place of the license. In fact, it is doubtful whether the filling out of report cards could be enforced unless the penalty of losing one's license for failure to do so could be provided.

(3) **Inspection Engineer.** It is proposed that a full-time sanitary engineer be added to the Sanitary Engineering Division of the State Department of Health, whose duty it will be to visit each municipal sewage-treatment plant in the state periodically for the purpose of investigating the plant and advising both the council and the operator concerning things that should be done to improve the operation.

The addition of a full-time sanitary engineer to the Engineering Division is suggested for the reason that there is nothing like personal instruction. An operator might be licensed and he might fill out a report card in an intelligent way, but still he may know very little about the fine points of sewage treatment. Knowing that the better a man really understands his work the better his results will be, it is suggested that a department engineer visit each plant at least once each week in order to point out the weak spots and to take each operator into his confidence.

Summary

There are at the present time approximately two hundred municipal sewage-treatment plants in Iowa. Judging from the results of the recent survey of twenty-six counties, it is safe to say that one-half of these plants are laboring under difficulties brought about by incompetent operation. There is a movement throughout the state to compel cities now discharging sewage into rivers to install sewage-treatment plants. It is indeed important to install treatment plants where they are really necessary, but it is just as important to operate properly the ones that have already been installed.

If the people of Iowa are really taking seriously the question of preventing stream pollution, they must see that the sewage-treatment plants installed for this purpose actually produce the results for

which they were built. If the people of the state are really taking seriously the matter of city expense, they must know that it is not true economy to pare down the cost of operating a plant for a period of years, and then to spend many times more at the end of that period. Satisfactory results can never be obtained from sewage-treatment plants without proper operation, and proper operation in the majority of places will never be obtained until the councils are made to realize, through education and legislation, that they must provide competent operators and provide sufficient money for yearly repairs.

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