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THE NEED FOR BETTER METHODS FOR DETERMINING THE PURITY OF STREAM WATER

H. V. PEDERSON

The prevention or control of stream pollution or the conservation of the quality of the water of streams has of late years become one of the primary objects of study in the United States. In the east a number of the states have been at work for several years and have arrived at some definite conclusion concerning the streams which flow through or border their states. A number of publications have been issued which clearly set forth the various problems of stream pollution and attempts have been made to explain a solution to the problem.

In our own state the question of stream pollution has been before the public a year but has not as yet reached a place where the majority are willing to remove the subject from purely a topic of conversation and accept it as a definite state problem which must be carefully and scientifically studied and worked out.

In his endeavor to present a correct idea of the problem of stream pollution to the people of the state, the writer must admit that he has so far failed. The outstanding obstacle encountered is the fact that many people do not believe there are any problems involved in stream pollution. The pessimists or those who wish to prevent every drop of waste matter from being discharged into the streams, look at me as a hopeless case when I talk about field equipment and appropriations to organize a field party for a careful investigation and study of a stream. They believe that wastes are wastes and if they are injurious to the condition of the streams they should be prevented from being discharged into the streams. That is all there is to it. Why should the state or any one need spend money studying a stream when all you need do is require everyone to cease discharging wastes into the stream?

The optimists or those who are not particularly interested in the conservation of the state's water resources do not believe that the conditions are nearly as bad as they really are, or will ever be a great deal worse. Their arguments are that they have observed how such a town or factory has discharged wastes for ever so long a time into a certain stream, but there has never

been one single word of complaint made. They see no particular reason why any one should spend good money in investigating a stream that no one has ever complained of and when they are told about the streams which have become public nuisances they immediately seem to take the attitude of the pessimists.

No one can realize more fully or understand better than the bacteriologist the necessity for making an intensive survey of the streams and a careful study of all the factors involved before a definite stream pollution program can be adopted. We realize that to seek to stop every bit of organic waste matter from being discharged into the streams would be the height of folly. We know that rivers are used by nature itself to purify this old world of ours. We know that no matter what it is or where it is, every thing eventually finds its way into a river and is there purified. It is as natural for the human race to use a stream as a place for the disposal of wastes as it is for nature itself to use it and no one can deny the fact that the human race has just as much right to the streams for this purpose as nature has.

The only difference between the use of the stream made by the human race and nature's use is that the human race has a tendency in its mad rush of progress to abuse its rights. Nature never abuses its rights. A little creek or small river is provided with only a small water shed. The greater the water shed or the greater the area from which the impurities accumulate the greater the river. In nature, all things are evenly balanced. Man, however, will build a large city on a small river and then keep on increasing the amounts of wastes discharged into the stream until the water has become so foul it cannot possibly purify itself and as a result becomes a public nuisance.

One industry located on the bank of some particular stream may have safely used the water for the disposal of its waste for many years without serious results, but woe and behold along comes a second industry which locates on the same stream and which says, "If one factory can use the stream, so can we," and then proceeds to discharge its waste into the river. The new industry does not stop for one single moment to find out whether or not the increased amount of wastes would over-burden the river or whether the water, because of lack of sufficient dilution, would become polluted far above all good sanitary practices.

An intensive survey of the rivers of Iowa would attempt first, to classify all the uses to which the streams are put and the var-

ious factors which involve the stream pollution problem of Iowa. Then the relative purity of the streams would be measured with the best known methods for making these determinations and all the sources of pollution would be located. With this data on hand it would not be impossible to believe that the limit of the amount of impurities that could safely be discharged into any stream could be determined. It is also reasonable to believe that a future date could be predicted when, with all things being equal, any stream would exceed a certain standard of purity. There are a number of reasons why a sanitary survey of Iowa streams should be made, but in the opinion of the writer the primary reason is because of the possibility of preventing future stream pollution before the conditions constitute a public nuisance. The whole underlying idea of all such work should be that of preventing serious conditions rather than to seek a cure after the conditions have become serious.

Measuring the amount of organic waste matter in a stream involves a considerable amount of work. So much work indeed that the average person has a difficult time in grasping the exact nature. It is a popular idea that if one sample of water from any point on a river is analyzed, it will tell the whole story, and even men ranking high in their professions seem puzzled when corrected.

The two best indexes to stream pollution are the oxygen determinations and the B. Coli count. Both these tests require considerable time and the very best that can be said about them is that they are only comparative tests. The public cannot understand comparison. It demands that things be stated in black and white—something tangible and definite. The greater the attempt made to explain the processes of measuring stream pollution the more puzzled the non-technical man is, and therefore he is inclined to consider it as being more or less “bunk.”

There is, for this reason, a need for more definite and simple methods of measuring the purity of a stream. Our present methods are not only complex, but do not even give results to which all engineers or bacteriologists will agree. It seems to the writer that there is much room for improvement and that this very fact opens up a large field for bacteriological research and study. If the bacteriologist can discover a more simple and more definite way for measuring the purity of the water in a stream, it will not only be a godsend to the field men who are required to do

this work, but it will make it much more easy for the people of the state to realize the true conditions and therefore they will be willing, much sooner, to take definite steps to bring about a needed sanitary survey of the streams of Iowa.

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