

## THE PROTECTION OF OUR RIVERS FROM POLLUTION.

BY JAY CRAVEN.

It has only been in the last few years that the two closely connected problems—pure water supplies and sewage disposal—have been gaining rapidly, increasing attention from sanitarians and others interested in the welfare of the public. Formerly but little attention was paid to the sanitary condition of our rivers. They were taken to be the natural and intended channels for the disposition of sewage and manufacturing wastes. Before our population was so concentrated, sewage disposal by dilution was satisfactory from a physical standpoint, but now the condition of many of our streams has become such that for a part of the year at least the odors from them are quite obnoxious and a nuisance to the cities and to the population living along the banks, as well as a menace to their health. Even though the large rivers may not be offensive, yet where these rivers have to be used for water supplies, diseases that may be carried by water constitute an always present menace to the health of our people.

Like many other problems, the public is not aroused until their attention has been attracted by severe measures. Epidemics, more terrible because they were due to a preventable disease, have occurred in the last few years, carrying with them a needless sacrifice of money, and more important, of human life. Just to cite one case, let me give a few figures from the typhoid epidemic at Erie, Pa., the population of which was 68,000. From December 1, 1910, to May 10, 1911, 1,012 cases and 125 deaths were reported to the health department. For comparative purposes a value of \$5,000 has frequently been placed on a man's value to the community. The loss to Erie at this figure was \$625,000, not including the expenses, such as loss of time, doctor bills, medicine, etc., of the remainder of the 1,012 who recovered.

Different States have taken up the problem and considerable work has been done in Massachusetts, New York, New Jersey, Pennsylvania and Ohio. In our State a bill was passed in 1909 providing for the protection of the streams from pollution. Since that time, extensive surveys have

been made by the State Board of Health for the purpose of determining the condition of Indiana lakes and streams.

In the summer of 1911 a sanitary survey of the Ohio River along the southern boundary of Indiana was made. The work was started at Cincinnati and samples of the river water were analyzed from this point to the mouth of the Wabash River. They were collected at every mile with the exception of a short distance, where circumstances made it necessary to take them every two miles. A study of the water and sewer system in each city or town of sufficient size to have such improvements, was made. Analyses, chemical and bacterial, were made of all water supplies, especial attention being given to those using the river for their source of supply. Manufacturing plants were visited, and if they were emptying waste into the river, the kind, together with an estimate of the amount, was noted.

In the summer of 1912, a survey of the Wabash River from Bluffton to its mouth was made and similar data collected. On both surveys a houseboat equipped for the laboratory work and living quarters was used. The first summer a one-room houseboat was prepared, and although it was used throughout the summer, it was found to be rather small for the work. Last summer a two-room houseboat was built, special attention being paid to the design.

This boat was found to be so well suited to the purpose that a stern paddle and an engine were installed, and it is to be used on White River next summer.

Although no immediate results were looked for, yet an agitation was started in three places on the Ohio River resulting in a treated water supply for one city and a change from the river to a well supply in two towns, so that it is felt that the cost of the trip has more than been justified already.

Valuable work can be done by the different States with respect to the rivers lying wholly within their control, but a great number of our important rivers flow through many States, and instead of having a State problem we have an interstate one, which is far more difficult to handle. It is therefore not a problem for one State, nor for a few of the States along a river, but one which federal legislation will have to regulate.

At a joint meeting of two comparative new associations, the Great Lakes Pure Water Association, and the National Association for Preventing the Pollution of Rivers and Waterways, held at Cleveland, Ohio, last

October, a tentative report of the latter committee on the feasibility of establishing standards of purity for river and waterways, was read. The men comprising the committee have a national reputation and have given much time and study to the problem, and the following extracts from their report should be of interest:

"This committee finds that on account of the increasing population of the country, it is and always will be physically impossible to maintain waterways in their original and natural condition of purity. A reasonable degree of cleanliness should nevertheless be demanded.

"The discharge of raw sewage into streams and harbors should not be universally prohibited by law. The method of disposal of sewage by dilution is recognized as sound in principle and safe in practice if carried on with proper restrictions.

"For each waterway at any given point there is a limit to the amount of permissible discharge of waste matter, depending upon the use that is made of the river and the character of the territory through which it flows. No universal standard of purity can be wisely established or maintained. When the extent of the pollution is such as to affect the public health in any way by any reasonable use of the river the sanitary aspect of the situation should control and the degree of the pollution should be regulated accordingly. The courts must decide what is reasonable use. When the extent of the pollution is such as to cause sensible offense to public decency in the course of any reasonable use of the river, this aspect of the situation may properly control. When the extent of pollution is such as to cause material injury to fish or shellfish industries, or to the ice industry, this element may control. When the extent of the pollution is such as to cause the silting up of the channels of navigable streams, this element may control.

"Even when the demand of public health, offense to decency and interference with navigation are such as to place a limit to the pollution of the streams the economic aspect of the case should be considered in regulating the amount of permissible discharge of waste matter, the fundamental principle being that the results accomplished shall be reasonably commensurate with the cost of prevention of the pollution.

"While no universal standard of purity applicable to all rivers and waterways can be established, it is believed to be feasible to establish and maintain appropriate standards of a general nature for waters that fall within certain particular groupings.

"Inasmuch as the safety of public water supplies is the most important element in the problem of stream pollution at the present time, the following general principles should govern the discharge of sewage and waste matters into rivers and waterways:

"Streams from which water supplies are taken without purification should not receive any fecal matter, sewage, sewage effluent or wastes that will render the water a menace to health or otherwise impair its natural quality.

"Streams from which water supplies are taken and used after purification should not receive fecal matter, sewage, sewage effluent or waste matter in such quantities that the contamination of the water at any water-works intake would put an unreasonable burden upon the purification works, or in quantities sufficient to produce the conditions referred to in the next paragraph.

"Streams not used for water supplies may receive sewage wherever and in such quantities that its entrance will not sensibly offend decency in the reasonable public use of the stream, or cause interference with navigation, or with valuable fish industries, or the ice industry. When this cannot be done, the sewage or wastes should receive such treatment before discharge as to bring the effluent within this rule, due regard being given to the relative cost of the processes required and the benefit to be derived.

"While recognizing that the pollution of many rivers and waterways is inevitable and that absolute prevention of pollution is impossible, it is deemed imperatively necessary that some control over the discharge of waste matter into rivers and waterways be maintained. The committee heartily endorses, therefore, the movement that is being made to keep the pollution of streams within reasonable bounds."

The problem of protection of our streams from pollution is one in which a general interest should be taken by everyone. Although the people on a stream below a city are directly affected, yet the urban population is affected indirectly by the food products such as vegetables and dairy supplies from farmers adjacent to the streams. Rapid strides are now being made in the protection of our rivers from pollution, and it is hoped that problem can be effectually controlled before long.