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Attention is called to the "Wants" column. It is invaluable to those who use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

PROGRESS IN SANITARY SCIENCE IN MASSACHUSETTS.

BY GEORGE W. FULLER, LAWRENCE, MASS.

THE State Board of Health of Massachusetts, in addition to the ordinary duties devolving upon such a Board, have made much progress during the past six years in the study of many important problems in sanitary science.

In 1886 the Legislature made provisions (Chap. 274 of the Acts of 1886) that "the State Board of Health shall have the general oversight and care of all inland waters. . . . Said Board shall, from time to time, as it may deem expedient, cause examinations of the said waters to be made for the purpose of ascertaining whether the same are adapted for use as sources of domestic water supplies or are in a condition likely to impair the interests of the public or persons lawfully using the same, or imperil the public health. It shall recommend measures for prevention of the pollution of such waters, and for removal of substances and causes of every kind which may be liable to cause pollution thereof, in order to protect and develop the rights and property of the Commonwealth therein and to protect the public health. It shall have authority to conduct experiments to determine the best practicable methods of purification of drainage or disposal of refuse arising from manufacturing and other industrial establishments. For the purposes aforesaid it may employ such expert assistance as may be necessary.

"It shall from time to time consult with and advise the authorities of cities and towns, or with corporations, firms or individuals either already having or intending to introduce systems of water supply or sewerage, as to the most appropriate source of supply, the best practicable method of assuring purity thereof or of disposing of their sewage, having regard to the present and prospective needs and interests of other cities, towns, corporations, firms or individuals which may be affected thereby. All such authorities, corporations, firms and individuals are hereby required to give notice to said Board of their intentions in the premises, and to submit for its advice outlines of their proposed plans or schemes in relation to water supply and disposal of drainage or refuse."

The Legislature in 1888 made further provisions (Chapter 375 of the Acts of 1888) that "all petitions to the Legislature for authority to introduce a system of water supply, drainage or sewerage, shall be accompanied by a copy of the recommendation and advice of the said Board thereon."

In compliance with these provisions there was established by the Board an engineering department, whose main work may be divided into two classes: (1) The examination of proposed plans or schemes of water supply or sewerage submitted by the various cities and towns; (2) the examination of existing water supplies and inland waters of the State with reference to their purity.

With regard to the work of the first class it is to be noted that from July, 1886, when the act relating to water supply and sewerage first went into operation, up to January 1, 1893, there have been received 228 applications for advice. In the course of the investigations, instituted to develop the facts required as a basis for sound advice to the cities and towns, many valuable data have been obtained. The capacity, when fully developed, of sources of water supply drawn from ponds, lakes and streams, has been studied individually and in relation to the future needs of the great centres of population. Probable and comparative costs of different systems have been made; drainage areas have been surveyed, records of rainfall, temperatures, rates of increase of population and of consumption of water per capita have been kept and studied. All of these data have not only been of aid in the past but are also of great value for future reference.

Beginning in June, 1887, monthly analyses have been made of water from all the water supplies of the State, and of the more important rivers and other inland waters. At the outset every public water supply was visited by the engineers of the Board; a description and history of the different works were obtained; places for taking samples of water were chosen, and methods to be followed were explained to local officials. Much information was also gathered with regard to the physical characteristics of the water supplies,—such as the density of population on drainage areas, amount of polluting matter entering the streams, volume of water flowing, and temperatures of water. In addition to the chemical analyses which are made in the laboratories of the Board in Boston, at the Massachusetts Institute of Technology, examinations are made of the grosser forms of microscopic life, with the view to establish the relation between the micro-organisms and odors present in certain drinking waters. Bacterial analyses are also made from time to time.

Carefully prepared reports have been made of the results of these investigations. An idea of the nature of the work done can perhaps be best learned by looking at the following list of subjects, which are among those discussed in the annual and special reports:—

A Summary of Water Supply Statistics.

Classification of the Drinking Waters of the State.

Examination of Spring Waters.

Pollution and Self-Purification of Streams.

Typhoid Fever in its Relation to Water Supplies.

Suggestions as to the Selection of Sources of Water Supply.

Dissolved Oxygen in Waters of Ponds and Reservoirs at Different Depths.

Effect of Aeration of Natural Waters.

The Relation of Organisms and Odors in Natural Waters.

The Seasonal Distribution of Organisms.

In 1887 the Board established an Experiment Station at Lawrence. The object of this was to learn how to purify sewage and water. The Station was designed and its work planned by Mr. Hiram F. Mills, A. M., C. E., chairman of the Committtee of the Board on Water Supply and Sewerage.

Experimental filters were constructed of different mate-