State of Connecticut

INVESTIGATION

OF THE

POLLUTION OF STREAMS

BY THE

State Board of Health

1914

State of Connecticut

PUBLIC DOCUMENT—SPECIAL

REPORT

ON THE

INVESTIGATION

OF THE

POLLUTION OF STREAMS

BY THE

State Board of Health

Under Authority of Chapter 220,
Public Act of 1913.

Report presented to the General Assembly of 1915.

HARTFORD
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1915

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The Board of Control

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1915

State of Connecticut

STATE BOARD OF HEALTH,

Hartford, December 23, 1914.

To the General Assembly of 1915:

The State Board of Health which was ordered by the last Legislature under Chapter 220, Public Acts of 1913, to investigate the subject of stream pollution and report to this General Assembly, submits the following report:

Chapter 220, Public Acts of 1913, reads as follows:

"AN ACT CONCERNING THE POLLUTION OF WATERS.

By the Senate and House of Representatives in General Assembly Convened:

"Section 1. The State Board of Health shall have general oversight of all inland and tidal waters, including streams, lakes, and ponds used as sources of water supply, and all springs, streams, and water courses tributary thereto.

"Sec. 2. The State Board of Health shall investigate the subject of the pollution of waters within this state by sewage or other filth and recommend to the next General Assembly such legislation as will lead to the termination of all such pollution.

"Approved, June 5, 1913."

The board, at a regular meeting held July 8, 1913, voted to place the investigation in the hands of a committee consisting of Mr. J. Frederick Jackson, chairman, Dr. Edward K. Root, Dr. J. H. Townsend and Mr. Lewis Sperry, and the work has been done under the supervision of Mr. Jackson, the engineer member of the state board of health, assisted by Mr. R. C. Meeker.

It was decided that the scope of the present investigation should include all rivers of appreciable size and the collection of the following statistics relating to them:

Stream flow.
Tributary streams.
Cities and towns on water sheds.
Population of water sheds.
Sewerage systems on water sheds.
Manufacturing wastes discharged into streams.
Analysis of river water.

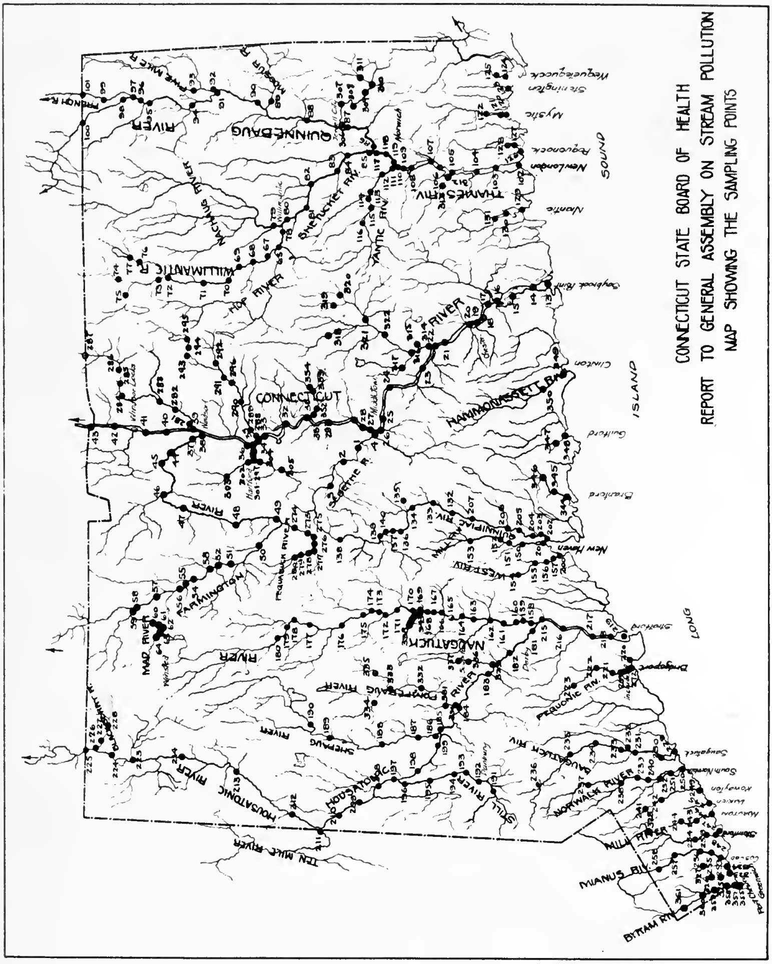
Samples of water to be collected at each town, one above and one below all points of pollution, and between towns at an average distance of one mile apart.

The Laboratory work to determine dissolved oxygen and presumptive tests for B. Coli.

On July 26th, 1914, the actual field work was started and the major portion completed by September. The collection of statistics of the towns and cities on the different watersheds involved a great deal of correspondence, and the Board wishes to acknowledge its indebtedness to the U. S. Geological Survey; U. S. Weather Bureau; U. S. Public Health Service; the State Boards of Health of Massachusetts, New Hampshire and Vermont; the Fish & Game Commission of this state, which kindly furnished the use of its launches, and the different city engineers and local health boards, and to Professor Conn and his assistants, whose co-operation and assistance at the State Laboratory has been invaluable.

Connecticut, as will be seen from a glance at the accompanying map, is a network of rivers. The natural drainage is controlled by the physiographic division of a highland west of a line running from New Haven to North Granby; a highland between Rhode Island and a line through Rockville, Glastonbury, Middletown and Branford; and a lowland occupying the remainder of the area. The three main river systems are the Connecticut, Housatonic and Thames, which together drain about 70 per cent. of the area of the state. The rivers extending beyond the boundaries of the state are the Housatonic, Connecticut, Farmington, Quinnebaug, Five Mile, Scantic, Moosup, French and Ten Mile River, which last is almost entirely in New York. The shore line is indented by numerous bays and tidal estuaries, and adjoining it are many salt marshes. In the interior are many swamps and numerous lakes.

All rivers entering the Sound are tidal, which fact is of considerable importance in providing an additional volume of water for dilution. The rivers of the highlands have steep gradients and their flow is interrupted by numerous dams



CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING THE SAMPLING POINTS

and mill ponds, while the rivers of the lowlands have a slight fall and the dams and rapids are not nearly so frequent. The flow of the streams is variable and in most years there is a period of four to six months when the flow is below normal, while in some of the smaller ones there is scarcely any flow.

The population of the state is grouped into three distinct areas. First, about 28 per cent. along the large rivers of the central portion of the state. Second, about 33 per cent. on the shores of Long Island Sound. Third, about 26 per cent. along the rivers in the highland areas, as the Farmington, Naugatuck and Willimantic, etc. The remaining 13 per cent. is distributed among the hill towns and other towns remote from the railroads and large streams.

The pollution of streams is a question which has occasioned more or less agitation and litigation since mankind forsook the nomadic life and began to dwell in cities and towns. Serious consideration of the subject began with the raising of the Royal Sewage Commission in Great Britain in 1865. This commission has published many valuable reports and directed considerable beneficial legislation. In this country the states of Ohio, Illinois, New York, New Jersey and Massachusetts have made careful study of the problem and have enacted legislation, more or less restrictive in character, to control it.

The subject may be considered from two viewpoints, depending on whether the stream in question is used, or is likely to be used, as a source of public water supply, when in a strictly sanitary sense the presence of pathogenic bacteria in the water and their direct menace to public health is paramount; or the violation of common decency by the creation of nuisances, from the presence in the stream of large quantities of organic matter. With the first we are, in this investigation, but indirectly concerned. Most of the rivers examined are not used as a source of public water supply without some attempt at purification.

Therefore, though we cannot say that the condition of the rivers most polluted is directly affecting the health of any community, we know that in many instances it is offensive to the sense of decency and that it threatens the existence of major fish life, which is a source of revenue and a means of sustenance to many hundreds of citizens of the state. The improvement of these conditions is not impossible nor would the expense be excessive, if remedial action is taken in time; the longer it is delayed the greater the cost will be.

The principal agent in disposing of organic matter in the streams is biological oxidation. This is accomplished primarily by innumerable bacteria breaking down and reducing

the organic wastes to their component parts, which are largely simple inocuous gases. These bacteria are of two general types, those requiring a considerable supply of oxygen for their existence and so termed aerobic, and those growing and multiplying in the absence of oxygen and called anaerobic. The work of the aerobic bacteria is most complete and is not markedly evident to the sense of sight or smell, since the gases produced are not objectionable. The work of the anaerobic bacteria is called putrefaction, it is less complete and is generally accompanied by the evolution of foul smelling gases and discoloration of the water. When the flow of the stream is large, naturally the supply of oxygen is greater, and the oxidizing of the organic matter progresses without producing offensive conditions; where the flow is small, or for any reason the supply of oxygen is cut off, the organic matter is not completely oxidized and nuisances are created. In this connection just a word in relation to self-purification of streams.

It has always been assumed that given a sufficient volume of water and velocity of flow a river would in time take care of any amount of wastes discharged into it. Since the important part that oxygen performs in the work of purification has been recognized, it has been found that not only must there be volume and velocity, but also time, as a function rather than distance, must be considered. In other words in any stream receiving pollution at a given point the process goes on something like this. The sewage and manufacturing wastes having been dispersed in the water, the organic matter immediately begins to take up the oxygen contained therein and this proceeds until the organic matter is completely oxidized or until the supply of oxygen in the water is completely exhausted. While the supply of oxygen in the water is being depleted it is gradually drawing and storing more oxygen from the air. The rate at which absorption proceeds is variable, depending on conditions of temperature, wind, depth of water, etc., so long as the supply of oxygen in the water is sufficient to oxidize the organic matter no objectional conditions will result. When, from any cause the amount of oxygen falls below a certain proportion, the organic matter is not completely disposed of, and foul gases and discoloration of the water accompanied by a large mortality among major fish life result. Now then, if the amount of oxygen in the river at the point considered were ample to take care of the pollution, after a certain length of time it would disappear completely. But let us go a step further, suppose a short distance below the point we are considering, the river receives an addition of sewage and wastes and that the elapsed time is not sufficient to dispose of

that already received; we then have an additional burden placed on the purifying powers of the river which it is not able to meet. If we continue this reasoning we can see why a river receiving pollution at points relatively close together will soon be in a very bad condition. If between the points of pollution the volume of the river is increased by the flow of a tributary, its capacity for disposing of pollution is increased, provided the tributary itself is not already so polluted that, instead of helping, it acentuates conditions already bad by the amount of its pollution.

When the flow of the stream is not sufficient to take care of the pollution by dilution it is evidenced by floating matters objectional to the sight and the formation of foul smelling sludge banks. These banks occur particularly in streams where the dry weather flow is very small; if the stream is deep and its volume of flow large, they are not so noticeable except in the vicinity of sewer outlets which do not extend out to the current of the river, or on the bottom of mill ponds when the water is drawn down.

There is considerable difference of opinion between authorities as to the stream flow necessary for proper dilution, but it may be safely said that with a flow of four to six cubic feet per second to each 1,000 persons contributing, together with adequate dispersion, no nuisance will occur, provided, the sewage does not contain over fifteen parts per 100,000 of suspended matter, in which case it would require a flow as high as fourteen cubic feet per second per 1,000 persons.

When the stream is receiving large quantities of trade waste the conditions are changed. The elimination of organic matter as stated is accomplished through the work of numerous bacteria, and some trade wastes not only impede this process by the complex nature of their ingredients which resist the breaking down process, but often the wastes contain acids which have a sterilizing effect and destroy the bacteria entirely.

Again oxygen is essential for the preservation of major fish life. Some differences exist as to the amount of oxygen necessary, but it is generally agreed that below 30 per cent. saturation it is impossible for larger fish life to survive.

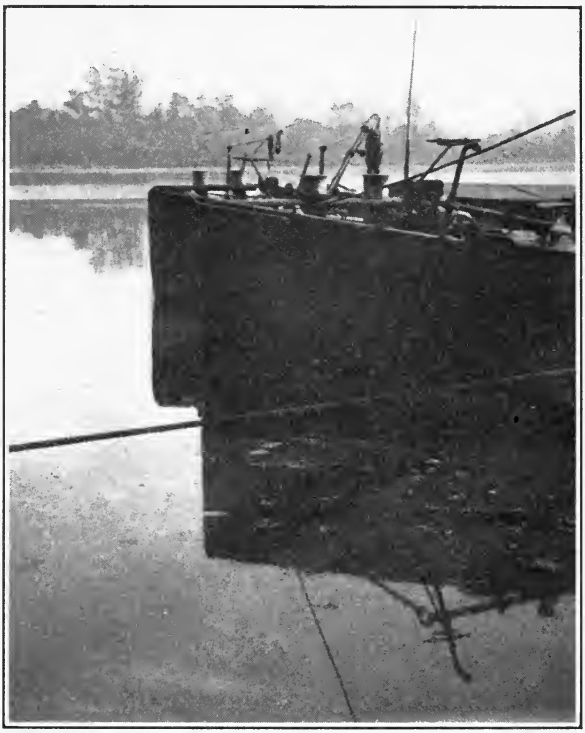
We have tried to describe briefly the part that oxygen takes in assisting the rivers to dispose of the organic matter they receive, in order to explain why the measure of dissolved oxygen is a reliable index of the ability of the river to purify itself, and because it is the method most generally used now in investigations of stream pollution. In the tabulations the time factor is recognized in the two determinations for dissolved oxy-

gen, one made immediately after collecting the samples, the other after a period of twenty-four hours.

We will now proceed to the consideration of the rivers themselves. The method adopted can, we believe, be followed readily. Each river with its tributaries is treated separately. First, there is a short description of its general characteristics and its condition, followed by tabulations of sampling stations, dissolved oxygen, statistics of towns on it and such diagrams and photographs as are necessary to make clear the results of the investigation.

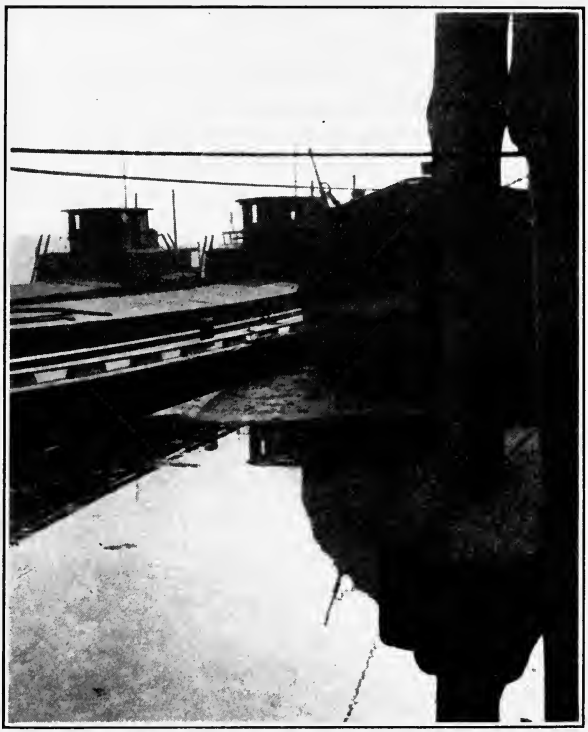
THE CONNECTICUT RIVER.

The Connecticut River drainage basin extends over four New England states, Connecticut, Massachusetts, New Hampshire and Vermont. Its total area is about 11,085 square miles, of which about 1,525 square miles lie in Connecticut, It rises in the Connecticut Lakes in northern New Hampshire and flows southerly a distance of about 340 miles, forming part of the boundary line between New Hampshire and Vermont. It then crosses Massachusetts and Connecticut and enters Long Island Sound at Saybrook. In Connecticut from the state line to Middletown it flows through a broad valley of sandstone formation. At Middletown, it enters a gorge like valley of crystalline rock formation and flows southeast to the Sound. From Enfield Rapids to Hartford the river has a fall of about six-tenths of a foot to the mile, from Hartford to Saybrook there is practically no fall.



CONNECTICUT RIVER, HARTFORD.

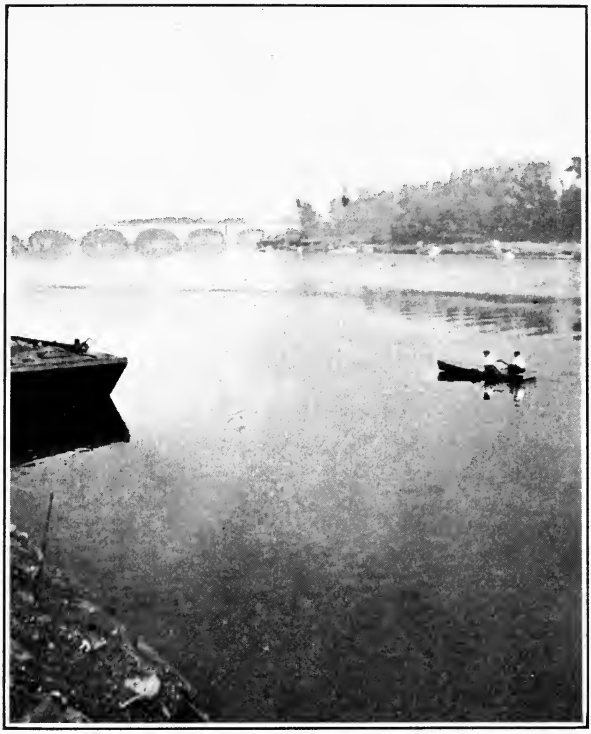
The river receives little sewage from New Hampshire and Vermont, though there are many factories on or near its banks which discharge their wastes into it. In Massachusetts the principal sources of pollution are Turners Falls, which has several paper mills; Amherst, a part of whose sewage is treated; numerous factories in the villages of Williamsburg, Haydensville, Baystate, Leeds and the City of Northampton. Holyoke contributes a considerable amount to the pollution of the river, as does the village of South Hadley. Below, the river receives all the sewage of Chicopee, Springfield and the town of Longmeadow. The effect of all this pollution is not as great at the state line as would be expected, though the percentage of oxygen, as shown by the analyses, approaches dangerously near the limit necessary to preserve major fish life.



CONNECTICUT RIVER, HARTFORD.

In Connecticut the river receives some pollution from the paper and silk mills at Windsor Locks, the distilleries at Warehouse Point, and the textile works at Thompsonville.

At Hartford the river receives practically all the sewage of the city and the wastes from numerous factories. The sewage enters the river through six outlets.

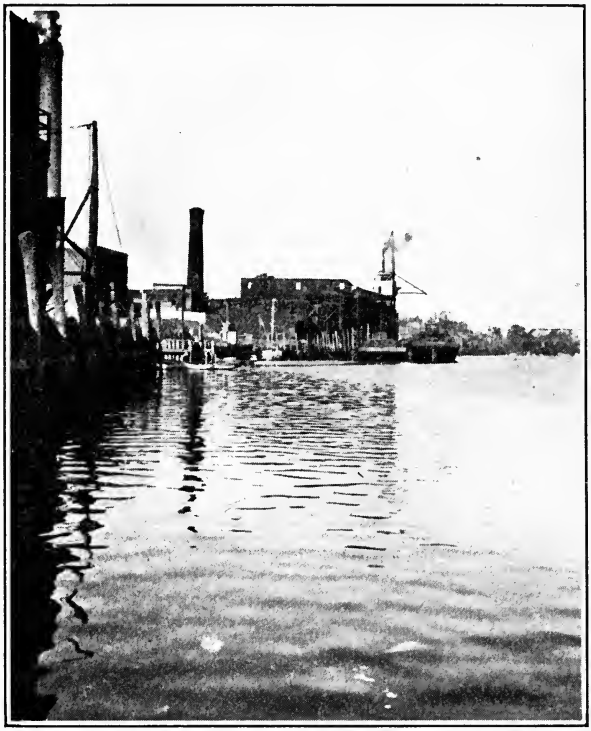


CONNECTICUT RIVER, HARTFORD.

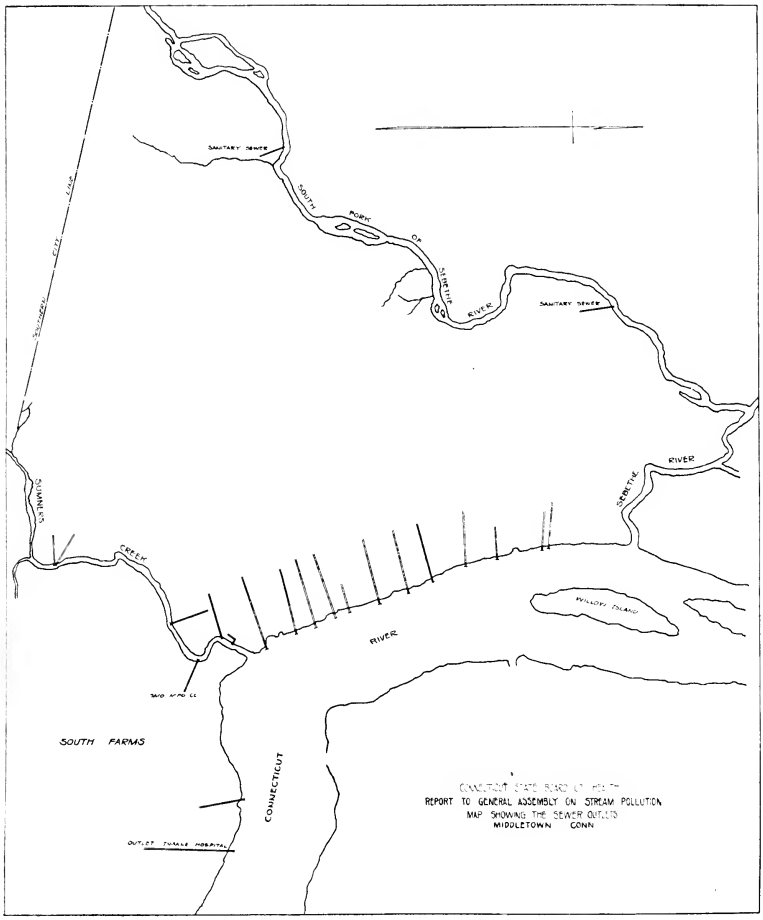
The other main sources of pollution are the City of Middletown, which discharges most of its wastes and sewage into it through fourteen outlets; and factory wastes from Higganum, Chester and Deep River, and it is undoubtedly polluted to some extent by the boats which ply up and down it.

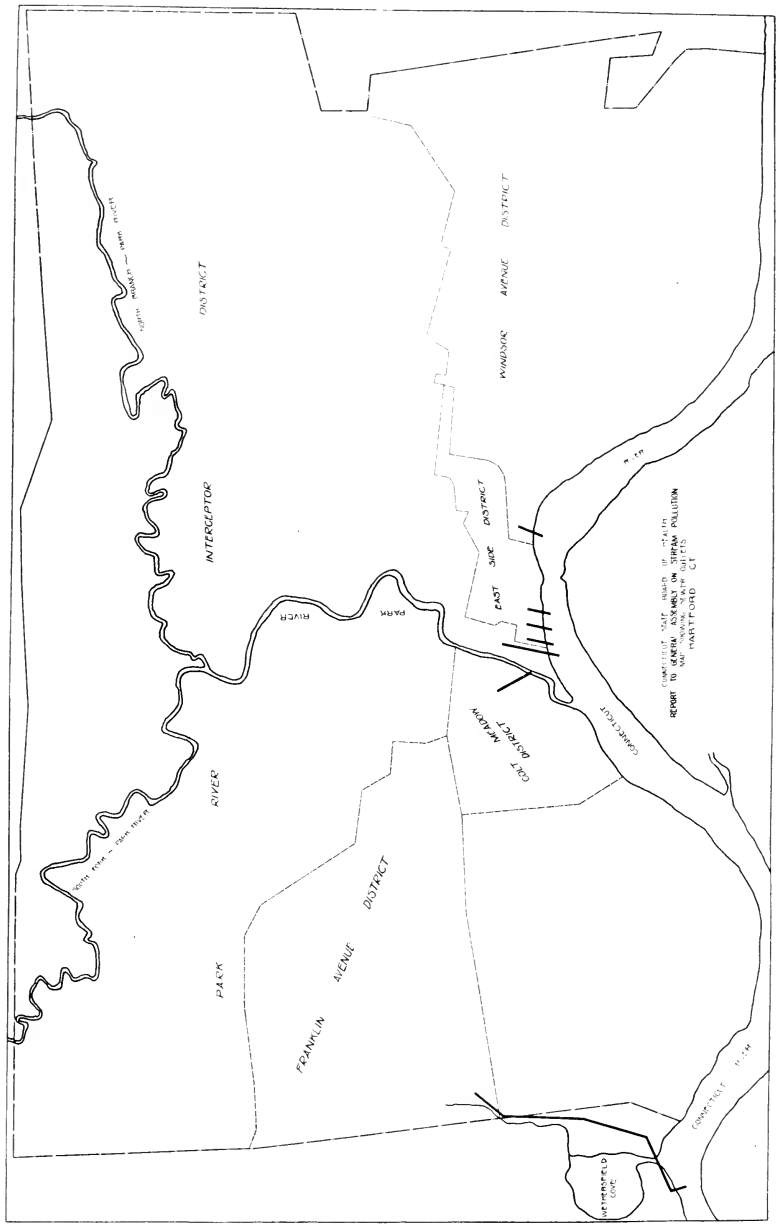
CONNECTICUT RIVER, MIDDLE HADDAM.

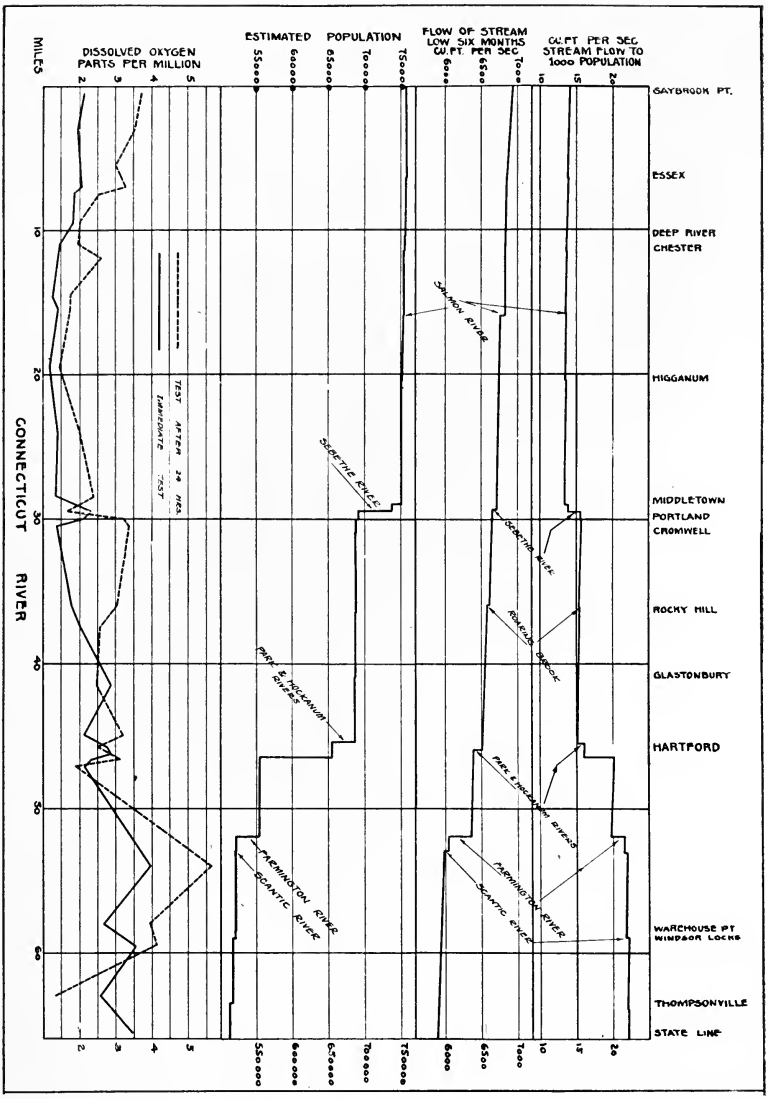
Considerable pollution is also contributed to the river by its tributaries, the Scantic, Farmington, Park, Hockanum, Sebethe and Salmon Rivers. But as each of these is treated separately they need not be considered here.

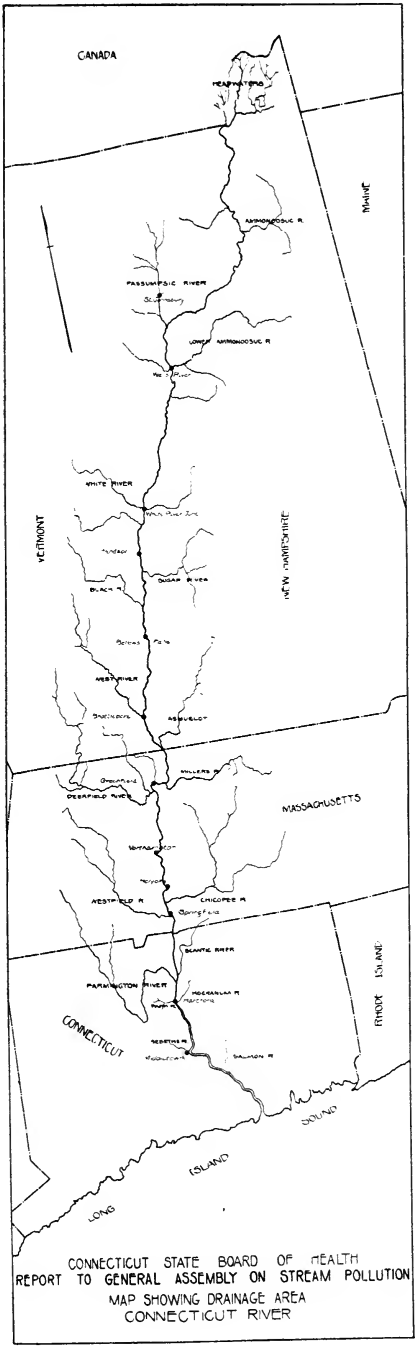


CONNECTICUT RIVER, MIDDLETOWN.


SANITARY SEWER
SOUTH
FORK
OF
SEBETHE
RIVER
SANITARY SEWER
RIVER
SEBETHE
WILLOW ISLAND
RIVER
SOUTH FARMS
CONNECTICUT
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING THE SEWER OUTLETS
MIDDLETOWN CONN


INTERCEPTOR
DISTRICT
WINDSOR AVENUE DISTRICT
EAST SIDE DISTRICT
COAST MCLEAN DISTRICT
FRANKLIN AVENUE DISTRICT
PARK RIVER
PARK RIVER
CONNECTICUT
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING MAIN OUTLETS
HARTFORD CT


MILES
DISSOLVED OXYGEN PARTS PER MILLION
ESTIMATED POPULATION
FLOW OF STREAM LOW SIX MONTHS CU.FT. PER SEC
CU.FT PER SEC STREAM FLOW TO 1000 POPULATION
CONNECTICUT RIVER
GAYBROOK PT.
ESSEX
DEEP RIVER
CHESTER
HIGGANUM
MIDDLETOWN
PORTLAND
CROMWELL
ROCKY HILL
GLASTONBURY
HARTFORD
WARCHOUSE PT
WINDSOR LOCKS
THOMPSONVILLE
STATE LINE
TEST AFTER 24 HRS.
IMMEDIATE TEST
SCANTIC RIVER
FARMINGTON RIVER
PARK & PODUNK RIVERS
ROCKY BROOK


CANADA
HEADWATERS
MAINE
AMMONOOSUC R.
PASSUMPSIC RIVER
LOWER AMMONOOSUC R.
WHITE RIVER
VERMONT
NEW HAMPSHIRE
SUGAR RIVER
BLACK R.
WEST RIVER
ASHUELOT
MILLERS R.
DEERFIELD RIVER
MASSACHUSETTS
WESTFIELD R.
CHICOPEE R.
SCANTIC RIVER
FARMINGTON RIVER
HOCKANUM R.
RHODE ISLAND
CONNECTICUT
SALMON R.
SOUND
ISLAND
LONG
CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING DRAINAGE AREA
CONNECTICUT RIVER

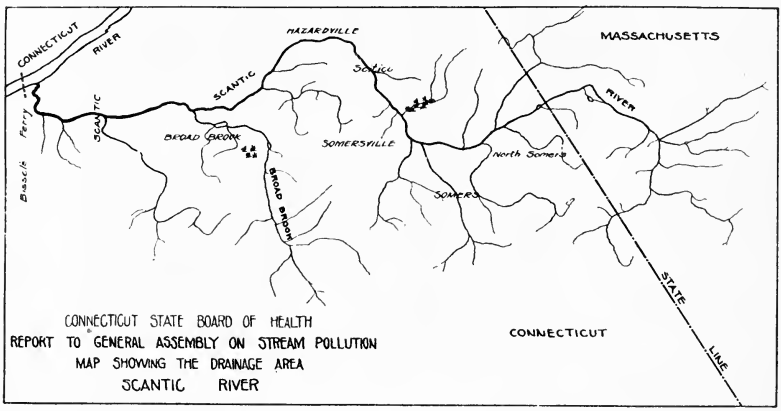
SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Opposite Saybrook Point	13	7/27	10:10	23	73	0	2.14	27
	A						3.74	47
At R. R. Bridge, Saybrook Junction	14	7/27	10:20	23	73	2	1.96	22
	A						3.47	39
Opposite Nott Island	15	7/27	10:50	26	79	6	2.0	24
	A						3.3	40
Below Eight Mile River Cove	16	7/27	11:50	27	81	..	2.04	25
	A						3.3	40
Above Eight Mile River Cove	17	7/27	1:00	24	75	8	1.87	21
	A						2.49	29
Below Deep River	18	7/27	1:20	22	72	..	1.82	20
	A						2.0	22
Below Chester	19	7/27	1:25	22	72	..	1.51	17
	A						1.96	22
Below Hadlyme Landing	20	7/27	1:40	23	73	3	1.42	16
	A						2.6	29
At Tylerville	21	7/27	2:00	23	73	..	1.24	14
	A						1.69	19
At Salmon Cove	22	7/27	2:10	23	73	2	1.42	16
	A						1.78	20
Below Higganum	23	7/27	2:45	23	73	2	1.16	13
	A						1.42	16
Opposite Middle Haddam	24	7/27	3:15	23	73	4	1.40	16
	A						2.0	23
Opposite South Farms	25	7/27	3.55	24	75	10	1.33	15
	A						2.40	28
At Highway Bridge, Middletown	26	7/28	10:00	25	77	2	2.3	27
	A						1.65	19
Above Willow Island	27	7/28	10:20	25	77	5	2.1	25
	A						3.22	38
Below Cromwell	28	7/28	10:25	25	77	1	1.56	18
	A						3.4	40
Below Rocky Hill	29	7/28	11:15	24	75	32	1.74	20
	A						3.05	35
Above Roaring Brook	30	7/28	11:35	24	75	0	2.02	23
	A						2.57	30
Opposite Keeney Cove	31	7/28	12:05	24	75	1	2.85	33
	A						2.48	29
Below Hockanum River	32	7/28	12:30	24	75	1	2.1	24
	A						3.22	37
Below Park River, Hartford	33	7/28	12:55	24	75	3	2.95	34
	A						2.48	29
Above Park River	34	7/28	1:00	24	75	2	2.85	33
	A						2.85	33
At Highway Bridge, Hartford	35	7/28	1:05	24	75	22	2.39	28
	A						3.13	36
At Railroad Bridge, Hartford	36	7/29	11:30	24	75	42	3.02	35
	A						2.75	32
At Bissel's Ferry	39	7/29	4:10	24	75	13	3.94	46
	A						5.68	66
Below Windsor Locks	40	7/29	4:35	24	75	16	2.65	31
	A						3.94	46
Above Windsor Locks at R. R. Bridge	41	7/29	5:05	24	75	5	3.57	41
	A						4.12	48
Below Thompsonbille	42	7/29	5:45	24	75	1	2.75	32
	A						1.37	16
At State Line	43	7/29	6:00	24	75	3	3.48	40

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures.												
				Silk Mills	Textile Works	Galvanizing Works	Distilleries	Dye Works	Gas Works	Laundries	Paper Mills	Soap	Metal Works	Breweries	Quarries	
Old Saybrook,	300	None	0	..	..	..	..	..	..	..	..	..	..	..	..	
Essex,	2,831	Partial	1,000	..	..	..	..	..	..	..	..	..	1	..	..	
Deep River,	500	Factory	50	..	..	..	..	..	..	..	..	..	2	..	..	
Chester,	1,455	Partial	500	..	..	..	..	..	..	..	1	..	4	..	..	
Higganum,	800	Partial	300	..	1	..	..	..	..	..	..	..	3	..	..	
Middletown,	13,204	Complete	12,000	3	2	1	..	..	1	2	..	1	6	..	..	
Portland,	3,253	Partial	2,000	..	..	..	..	..	..	..	..	..	3	..	2	
Cromwell,	400	Factory	50	..	..	..	..	..	..	..	..	..	1	..	..	
Rocky Hill,	300	Factory	100	..	..	..	..	..	..	..	..	..	2	..	..	
Glastonbury,	600	Factory	300	..	..	1	..	..	..	..	2	1	..	..	..	
Hartford	105,541	Complete	105,000	..	5	5	..	1	1	7	3	..	12	3	..	
Warehouse Pt.,	400	Factory	200	1	..	..	2	..	..	..	..	..	..	..	..	
Windsor Locks,	3,976	Partial	3,000	1	2	..	..	..	..	..	4	..	4	..	..	
Thompsonville,	4,000	Partial	3,000	..	3	..	..	..	..	..	..	..	4	..	..	
Total,	137,560		127,500	5	13	7	2	1	2	9	10	2	42	3	2	

THE SCANTIC RIVER.

The Scantic River enters the Connecticut River from the east above Windsor. Its total drainage area is about 114 square miles, about 25 square miles of which are in the state of Massachusetts. It is a rapid stream with considerable fall, particularly at Hazardville. Below Scantic and Broad Brook the river is badly discolored, presumably by the wastes from the mills at these places. The river also receives some pollution from the factories at Hazardville.



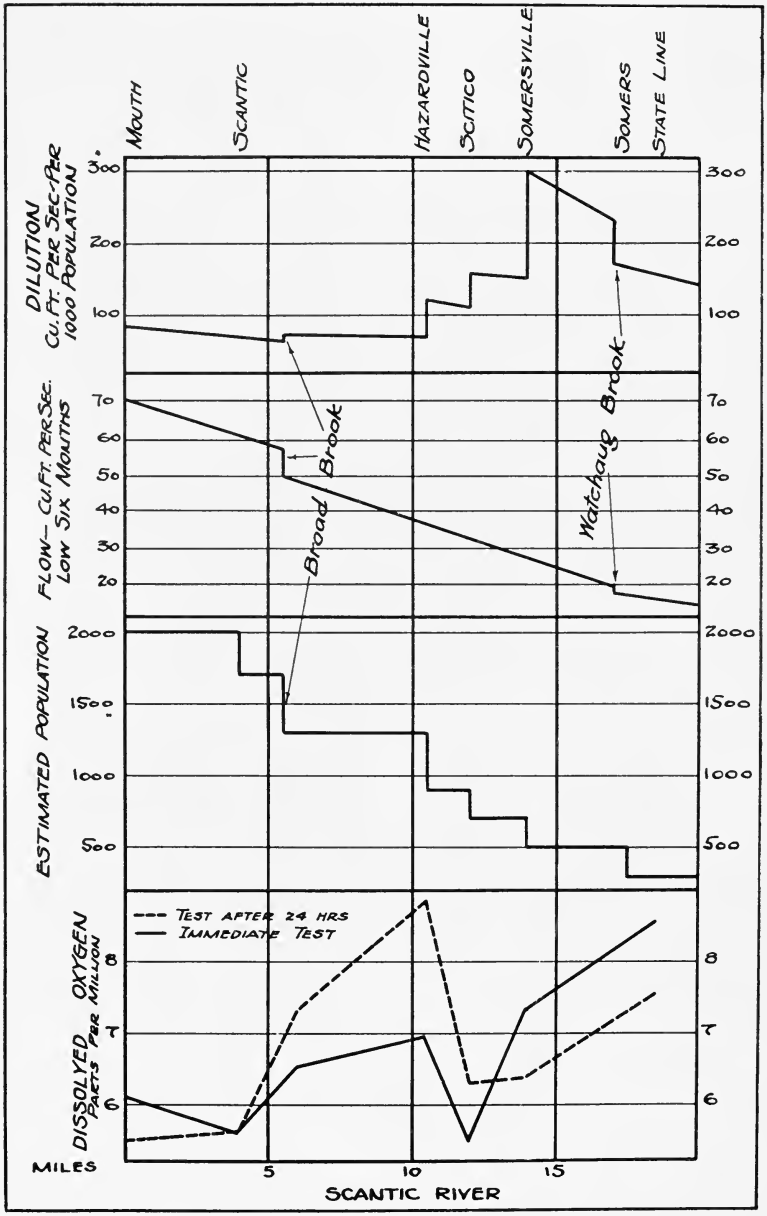
SAMPLING STATIONS AND DISSOLVED OXYGEN.

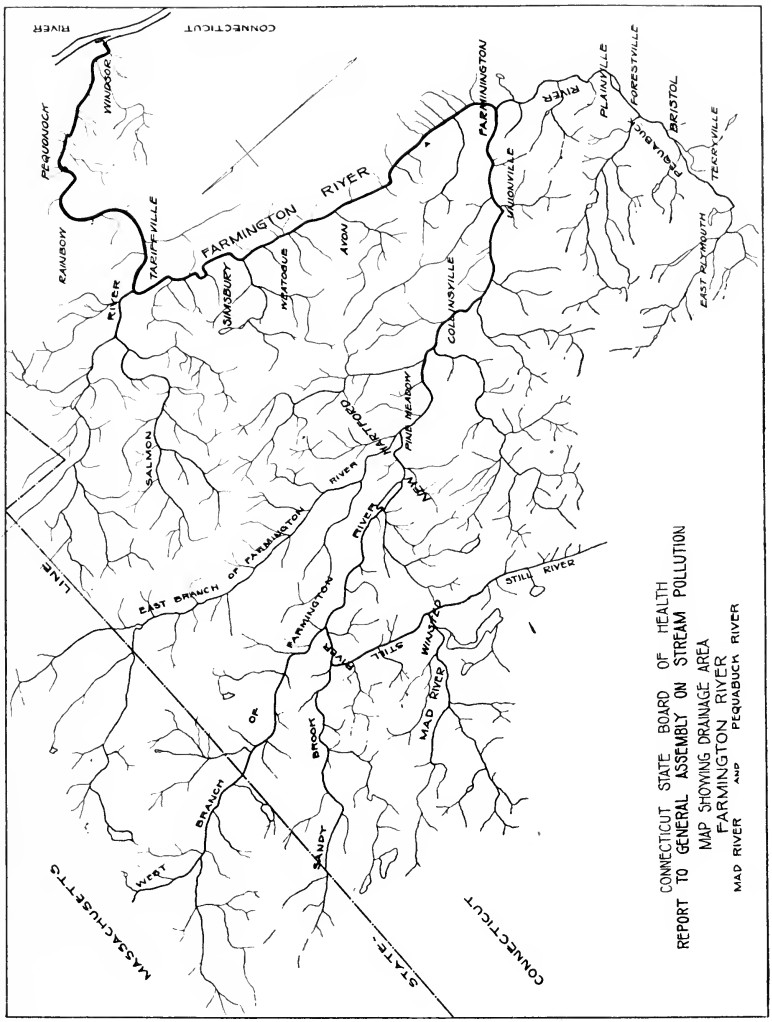
Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts per Million	Per Cent. Saturation
Mouth	281	11/10	10:00	6	43	12	6.11	48
	A						5.56	44
Below Scantic	282	11/10	11:00	6	43	11	5.75	46
	A						5.93	47
Above Broad Brook	283	11/10	12:00	6	43	5	6.54	52
	A						7.39	59
At Hazardville	284	11/10	1:30	6	43	3	6.93	55
	A						8.85	70
At Scitico	285	11/10	2:15	6	43	5	5.47	43
	A						6.29	50
At Somersville,	286	11/10	3:25	6	43	8	7.57	60
	A						6.39	51
State Line	287	11/10	4:50	6	43	3	8.58	69
	A						7.57	60

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures	
				Paper Mills	Textile Works
Scantic	300	None	0	..	..
Broad Brook	400	Factory	200	..	1
Hazardville	400	Factory	200	..	1
Scitico	200	Factory	100	1	..
Somersville	200	Factory	100	..	1
Somers	200	None	0	..	..
Total	1,700		600	1	3

THE FARMINGTON RIVER.

The Farmington River enters the Connecticut River from the west at Windsor. It has a drainage area of about 590 square miles, of which about 100 square miles are in Massachusetts. It is a very swift stream flowing through a region of sandstone formation and having a fall of about thirty feet to the mile from Cold Springs, Mass., to New Hartford.


MOUTH
SCANTIC
HAZARDVILLE
SCITICO
SOMERSVILLE
SOMERS
STATE LINE
DILUTION
CU. FT. PER SEC. PER 1000 POPULATION
300
200
100
FLOW — CU. FT. PER SEC.
LOW SIX MONTHS
70
60
50
40
30
20
BROAD BROOK
WATCHAUG BROOK
ESTIMATED POPULATION
2000
1500
1000
500
DISSOLVED OXYGEN
PARTS PER MILLION
8
7
6
TEST AFTER 24 HRS
IMMEDIATE TEST
MILES
5
10
15
SCANTIC RIVER


CONNECTICUT RIVER
WINDSOR
PEQUABUCK
RAINBOW
RIVER
TARIFFVILLE
FARMINGTON RIVER
SIMSBURY
WATTOLES
AVON
FARMINGTON
UNIONVILLE
RIVER
PLAINVILLE
FORESTVILLE
BRISTOL
TERRYVILLE
EAST PLYMOUTH
COLLINSVILLE
NEW BRITAIN
MARTFORD
RIVER
SALMON
EAST BRANCH OF FARMINGTON
RIVER
NEW
FARMINGTON
RIVER
STILL
RIVER
WINDSOR
MAD RIVER
BROOK
SANDY
WEST
BRANCH
OF
FARMINGTON
RIVER
STILL
RIVER
LINE
STATE
MASSACHUSETTS
CONNECTICUT
CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING DRAINAGE AREA
FARMINGTON RIVER
AND
MAD RIVER PEQUABUCK RIVER

The sources of pollution are the sewage and factory wastes from Windsor, Poquonock, Rainbow, Tariffville, Simsbury, Farmington, Unionville, Collinsville and New Hartford.

The flow is variable and during the low six months when the flow is held back by dams at the several towns there is very little

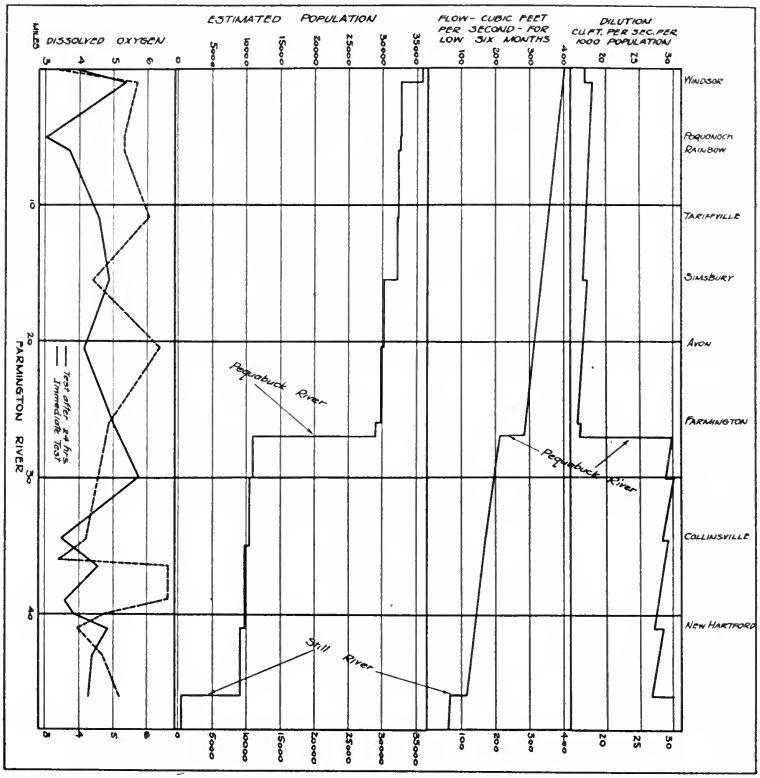
FARMINGTON RIVER, UNIONVILLE.

water in some parts of the river. However, these dams and mill-ponds aid the river in disposing of the waste from the towns by affording means for aeration and sedimentation. This may account, in part, for the fact that, at the date when the examinations were made, the river did not show excessive pollution except in the immediate vicinity of one or two towns.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

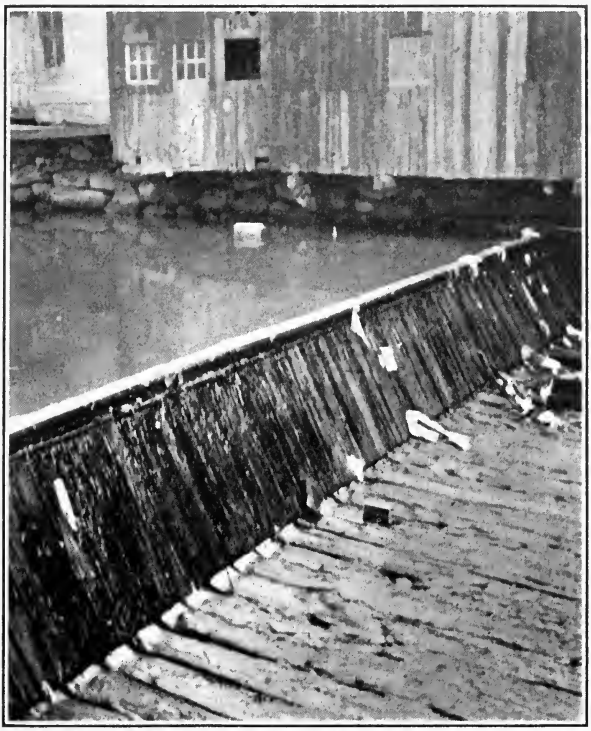
Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts per Million	Per Cent. Saturation
At Mouth	38	7/29	3:20	24	75	8	3.85	45
	A						3.39	43
Below Windsor	37	7/29	2:45	24	75	29	5.41	63
	A						5.68	66
Below Poquonock	44	7/31	9:00	22	72	24	2.99	33
	A						5.27	59
Below Rainbow Dam	45	7/31	9:20	22	72	3	3.69	41
	A					Broken	Bottle	
Below Tariffville	46	8/4	5:30	22	72	6	4.58	49
	A						6.05	65
Below Simsbury	47	8/4	5:40	22	72	2	4.86	52
	A						4.4	47
At Avon	48	7/31	10:45	22	72	6	4.13	45
	A						6.36	69
Below Farmington	49	7/31	11:30	22	72	10	4.99	54
	A						4.87	53
At Unionville	50	7/31	11:55	22	72	24	5.77	62
	A					Broken	Bottle	
Below Collinsville	51	7/31	12:30	22	72	0	3.45	39
	A					Broken	Bottle	
Above Collinsville below Nepaug River	52	8/3	10:15	22	72	4	4.3	48
	A						3.34	37
Below Cherry Brook	53	8/3	10:30	22	72	1	4.53	51
	A						6.6	74
At Satan's Kingdom Bridge	54	8/3	10:50	22	72	6	3.57	40
	A						6.6	74
At Pine Meadow above East Branch	55	8/3	11:05	22	72	12	4.76	53
	A						3.85	43
Above New Hartford	56	8/3	11:20	22	72	1	4.86	55
	A						3.94	44
At Pleasant Valley	57	8/3	11:30	22	72	3	4.4	49
	A						4.67	52
At Mouth of West Branch at Dam	58	8/3	12:00	22	72	1	4.26	48
	A						5.13	58

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures			
				Textile Works	Paper Mills	Metal Works	Grist Mills
Windsor	3,000	Partial	2,000	..	..	2	..
Poquonock	200	Factory	100	1	1	..	..
Rainbow	200	Factory	100	..	3	..	..
Tariffville	200	Private	50	..	..	..	..
Simsbury	2,000	Partial	1,000	..	..	1	1
Avon	300	Factory	50	..	..	1	..
Farmington	900	Partial	500	..	..	..	..
Unionville	500	Factory	400	1	3	1	..
Collinsville	600	Factory	200	..	..	1	..
New Hartford	800	Factory	400	1	..	..	..
Total	8,700		4,800	3	7	6	1


DISSOLVED OXYGEN
ESTIMATED POPULATION
FLOW - CUBIC FEET PER SECOND - FOR LOW SIX MONTHS
DILUTION CU.FT. PER SEC. PER 1000 POPULATION
MILES
FARMINGTON RIVER
Pequabuck River
Still River
Windsor
Poquonock Rainbow
Tariffville
Simsbury
Avon
Farmington
Collinsville
New Hartford

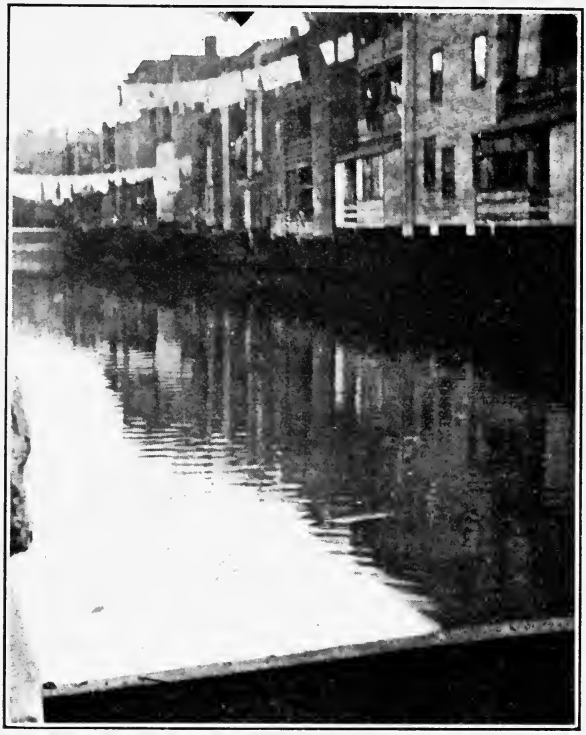
THE STILL AND MAD RIVERS.

The Mad River is the main tributary of the Still River which enters the west branch of the Farmington at Riverton. From Winsted to its mouth the Still River is a sluggish stream flowing through meadow-land, while the Mad River is rapid flowing, with several dams at Winsted. The total drainage area is about 80 square miles.



MAD RIVER, WINSTED.

The principal sources of pollution on these rivers are the towns of Winsted and East Winsted, in the vicinity of which the water



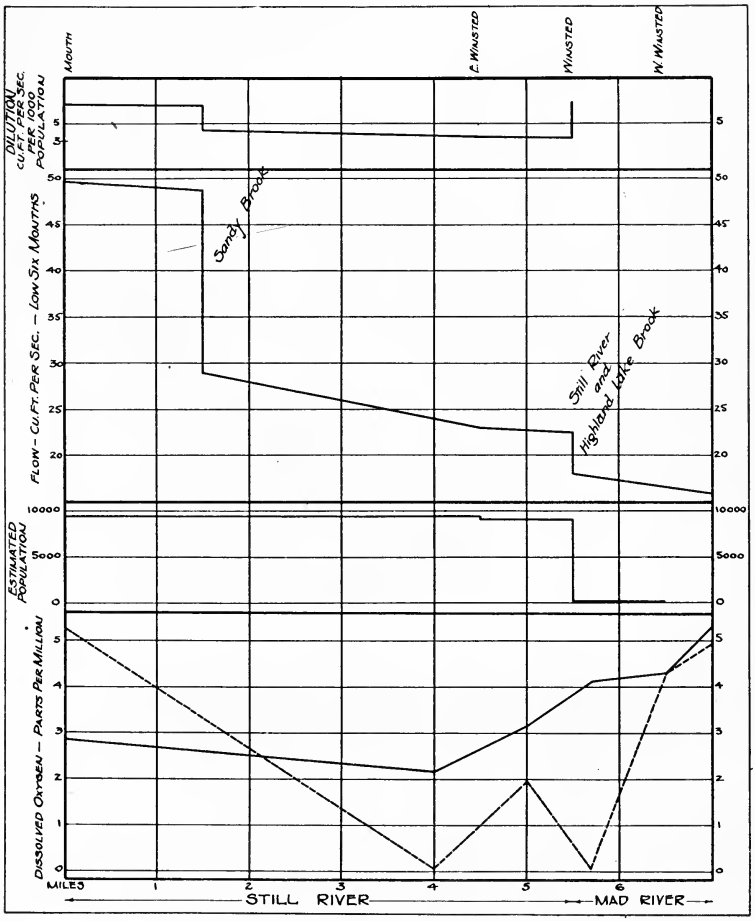
MAD RIVER, WINSTED.

is very badly discolored and has a strong odor. Winsted has had plans submitted for treating its sewage, but as yet has not started work on the construction of the plant.

SAMPLING STATIONS AND DISSOLVED OXYGEN

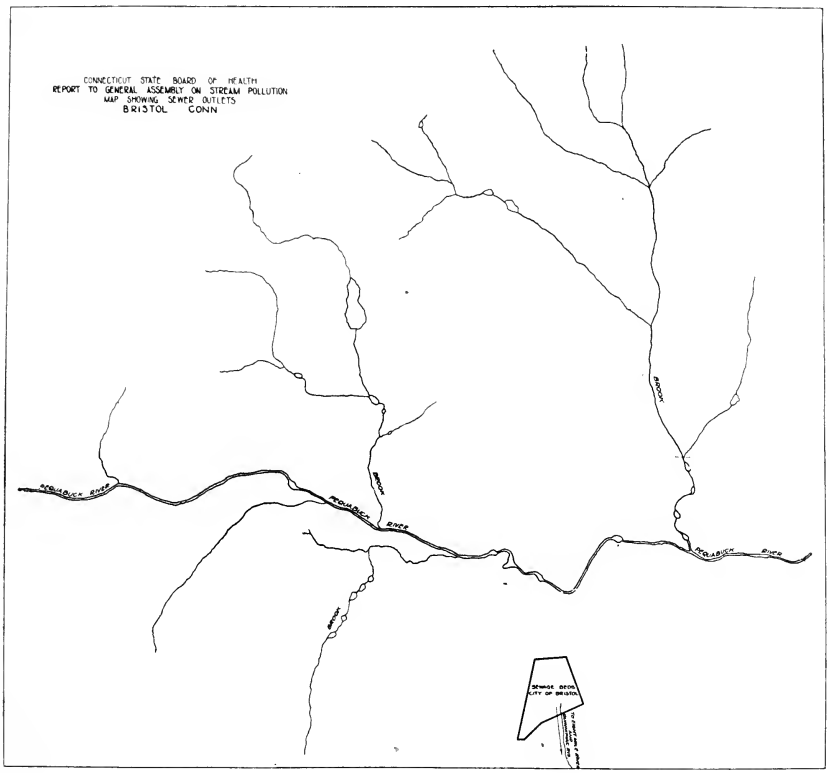
Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts per Million	Per Cent. Saturation
At Mouth above Dam	59	8/3	12:35	22	72	0	2.81	31
	A						5.22	59
Below East Winsted	60	8/3	1:00	22	72	5	2.19	24
	A						.36	4
At Winsted below Brass Factory	61	8/3	1:30	22	72	12	3.11	35
	A						1.92	21
At Dam below Winsted R. R. Sta.	62	8/3	2:00	22	72	0	4.12	46
	A						.36	4
At Dam below Knife Factory, Winsted	63	8/3	2:15	22	72	23	4.3	48
	A						4.3	48
Above West Winsted	64	8/3	2:30	22	72	1	5.31	60
	A						4.9	55

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures				
				Silk Mills	Textile Works	Gas Works	Laundries	Metal Works
East Winsted	200	None	0	..	..	..	..	..
Winsted	7,754	Partial	5,000	1	3	1	1	10
West Winsted	200	None	0	..	..	..	..	..
Total	8,154		5,000	1	3	1	1	10


MOUTH
E. WINSTED
WINSTED
W. WINSTED
DILUTION CU.FT. PER SEC. PER 1000 POPULATION
FLOW - CU.FT. PER SEC. - LOW SIX MONTHS
Sandy Brook
Still River and Highland Lake Brook
ESTIMATED POPULATION
DISSOLVED OXYGEN - PARTS PER MILLION
MILES
STILL RIVER
MAD RIVER

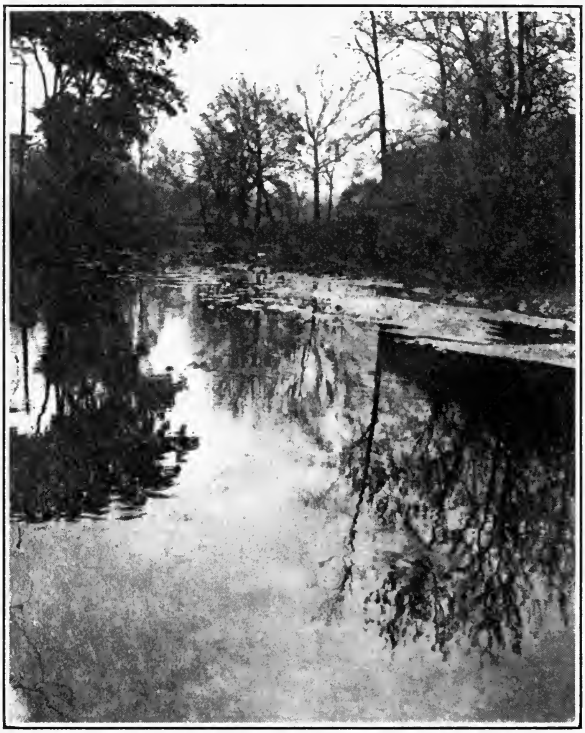
THE PEQUABUCK RIVER.

The Pequabuck enters the Farmington River near Farmington. It is a rather sluggish stream and between the towns of Bristol and Plainville flows through a thickly populated district. Its drain-



age area is about 58 square miles. There are numerous small dams and mill ponds on it which to some degree aid the river in disposing of its excessive sewage by aeration and sedimentation. However, during the low stage the river banks where the water has receded show many objectional deposits of sludge.

The principal sources of pollution are the towns of Plainville, Forestville, Bristol and Terryville, all of which, with the exception of Bristol, which has a disposal plant, discharge their sewage into the river without treatment. In addition there are many factories which discharge their waste into it.

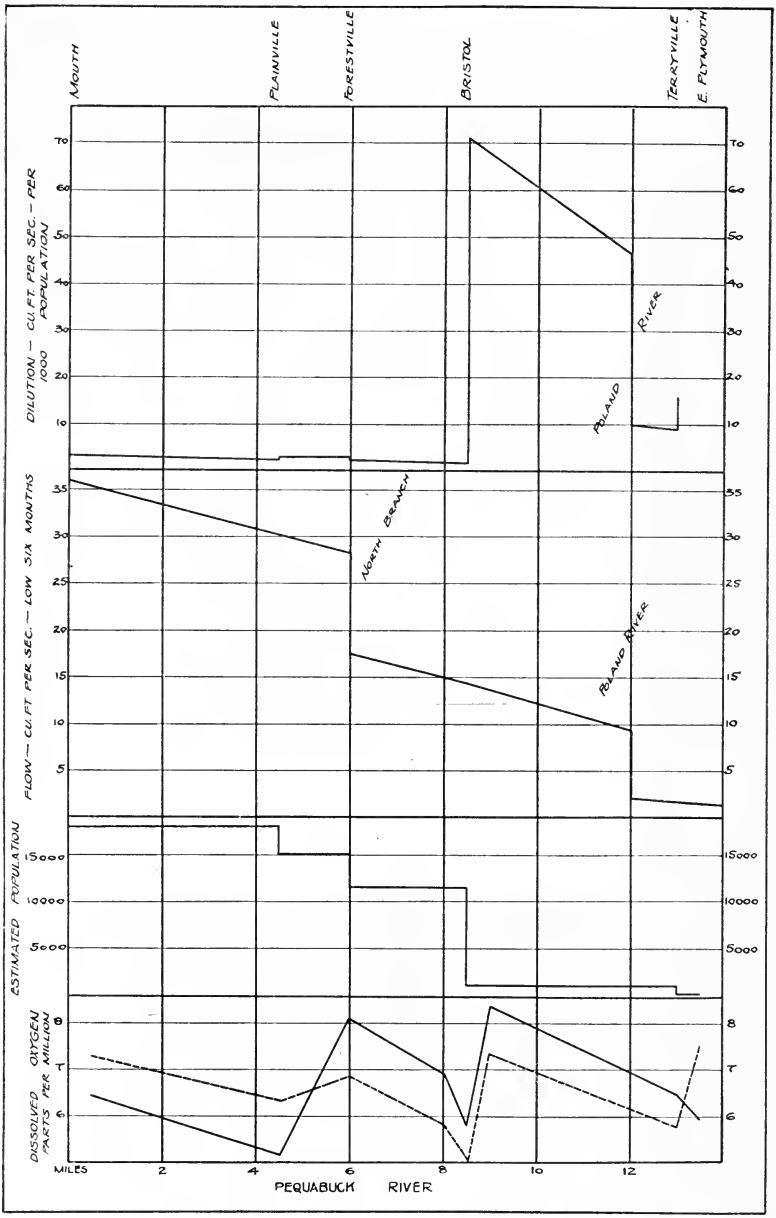


PEQUABUCK RIVER, BRISTOL.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

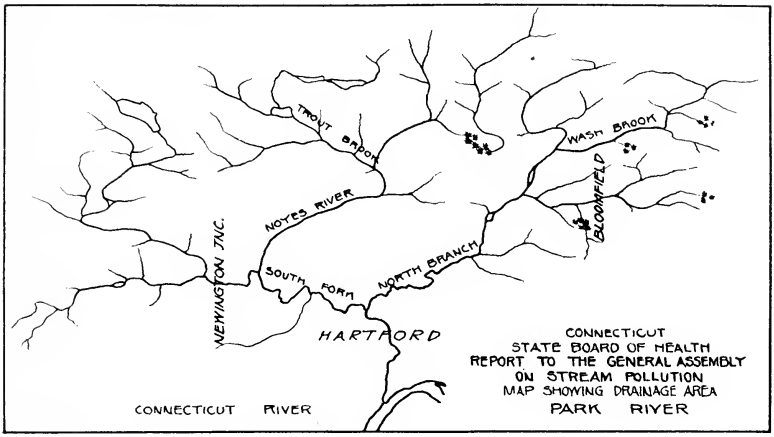
Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts per Million	Per Cent. Saturation
Mouth	274	10/29	9:30	7	44	11	6.43	52
	A						7.28	59
At Plainville	273	10/29	9:10	7	44	7	5.18	42
	A						6.37	52
At Forestville	275	10/29	10:00	7	44	45	8.09	66
	A						6.82	56
Below Bristol	276	10/29	10:30	7	44	18	6.91	56
	A						5.82	47
At Bristol	277	10/29	10:55	7	44	6	5.82	47
	A						5.09	41
Above Bristol	278	10/29	11:20	7	44	5	8.37	68
	A						7.37	60
At Terryville	279	10/29	11:55	7	44	5	6.64	54
	A						6.00	49
Below East Plymouth	280	10/29	12:40	7	44	12	6.18	50
	A						7.55	62

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures: Galvanizing Works	Paper Mills	Metal Works	Laundries	Textile Works
Plainville	3,000	Partial	1,500	..	..	11	..	1
Forestville	3,500	Partial	2,000	..	..	4	..	..
Bristol	10,550	Disposal Plant	8,000	1	1	16	1	2
Terryville	800	Factory	200	..	..	3	..	..
Plymouth	100	None	0	..	..	..	..	..
Total	17,950		11,700	1	1	34	1	3

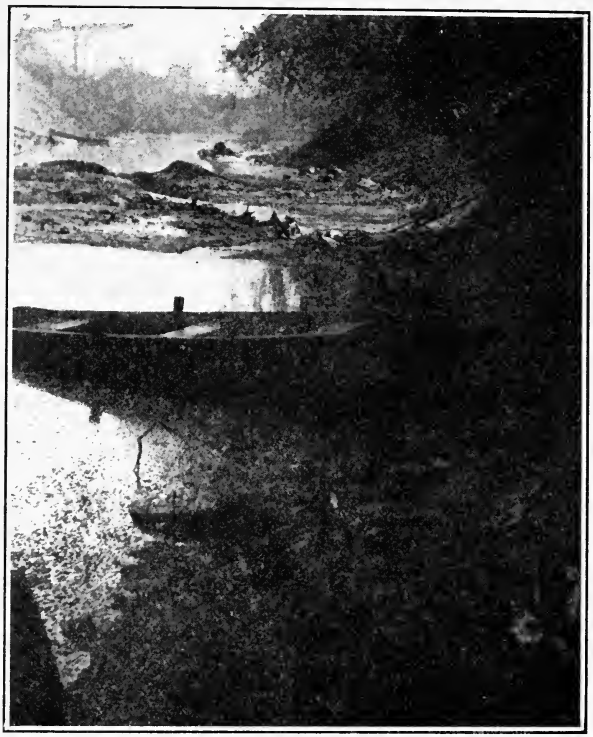

MOUTH
PLAINVILLE
FORESTVILLE
BRISTOL
TERRYVILLE
E. PLYMOUTH
DILUTION — CU. FT. PER SEC. — PER 1000 POPULATION
FLOW — CU. FT. PER SEC. — LOW SIX MONTHS
ESTIMATED POPULATION
DISSOLVED OXYGEN PARTS PER MILLION
NORTH BRANCH
POLAND RIVER
POLAND RIVER
MILES
PEQUABUCK RIVER

THE PARK RIVER.

The Park River enters the Connecticut from the west, just below Hartford. It has a drainage area of about 79 square miles and is a shallow stream flowing through a thickly populated area from

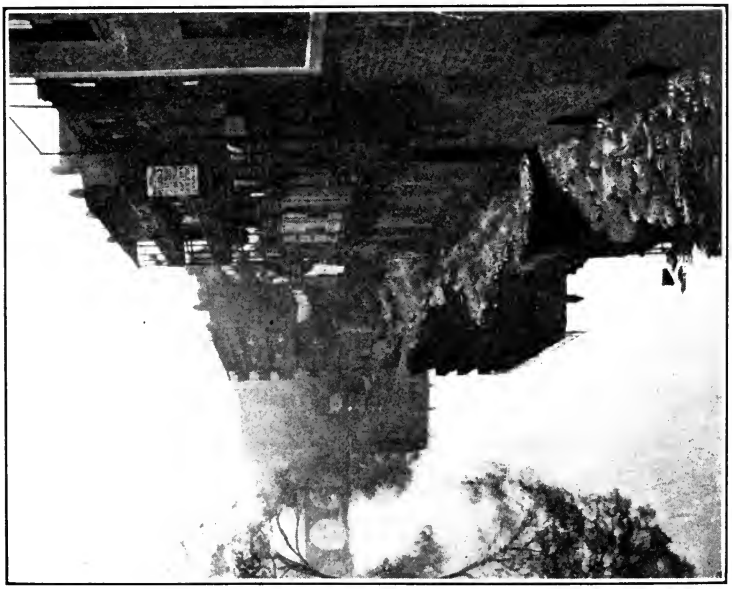


Bloomfield to its mouth. The river is badly polluted along the city of Hartford and gives off a strong odor. On the South Fork conditions are not so bad, though floating solids are frequently seen.



PARK RIVER, HARTFORD.

PARK RIVER, HARTFORD.



PARK RIVER, HARTFORD.

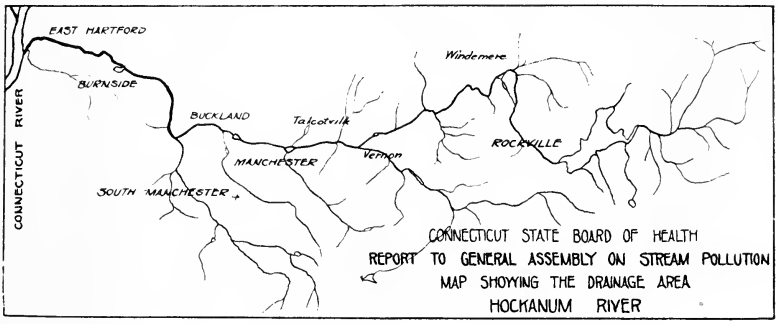
SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts per Million	Per Cent. Saturation
Mouth	297	11/12	10:35	7	44	25	4.74	38
	A						3.92	32
Hartford at Commerce street	298	11/12	11:00	7	44	16	4.01	32
	A						2.46	20
Hartford, above Main street	299	11/12	11:55	7	44	2	7.12	58
	A						4.29	35
Hartford at Broad street	300	11/12	12:25	7	44	4	7.12	58
	A						5.75	47
Hog River Mouth	301	11/12	1:00	7	44	6	6.11	50
	A						5.66	46
Hog River, Albany Ave. above Hartford	302	11/12	1:55	7	44	3	7.75	63
	A						6.84	56
Washington Brook below Bloomfield	303	11/12	3:05	7	44	1	7.85	64
	A						7.76	63
South Fork Mouth	304	11/12	4:00	7	44	3	6.93	56
	A						7.76	63
South Fork above West Hartford	305	11/12	4:25	7	44	0	6.84	56
	A						6.48	53

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures		
				Paper Mills	Metal Works	Breweries
Hartford	1,000	Complete	1,000	..	3	1
West Hartford	5,456	Partial	4,000	..	..	..
Newington	300	Factory	50	1	..	..
Bloomfield	400	None	0	..	..	..
Total	7,156		5,050	1	3	1

THE HOCKANUM RIVER.

The Hockanum River enters the Connecticut from the east just below Hartford. It has a drainage area of about 84 square miles and is a rather sluggish stream flowing through a region of glacial



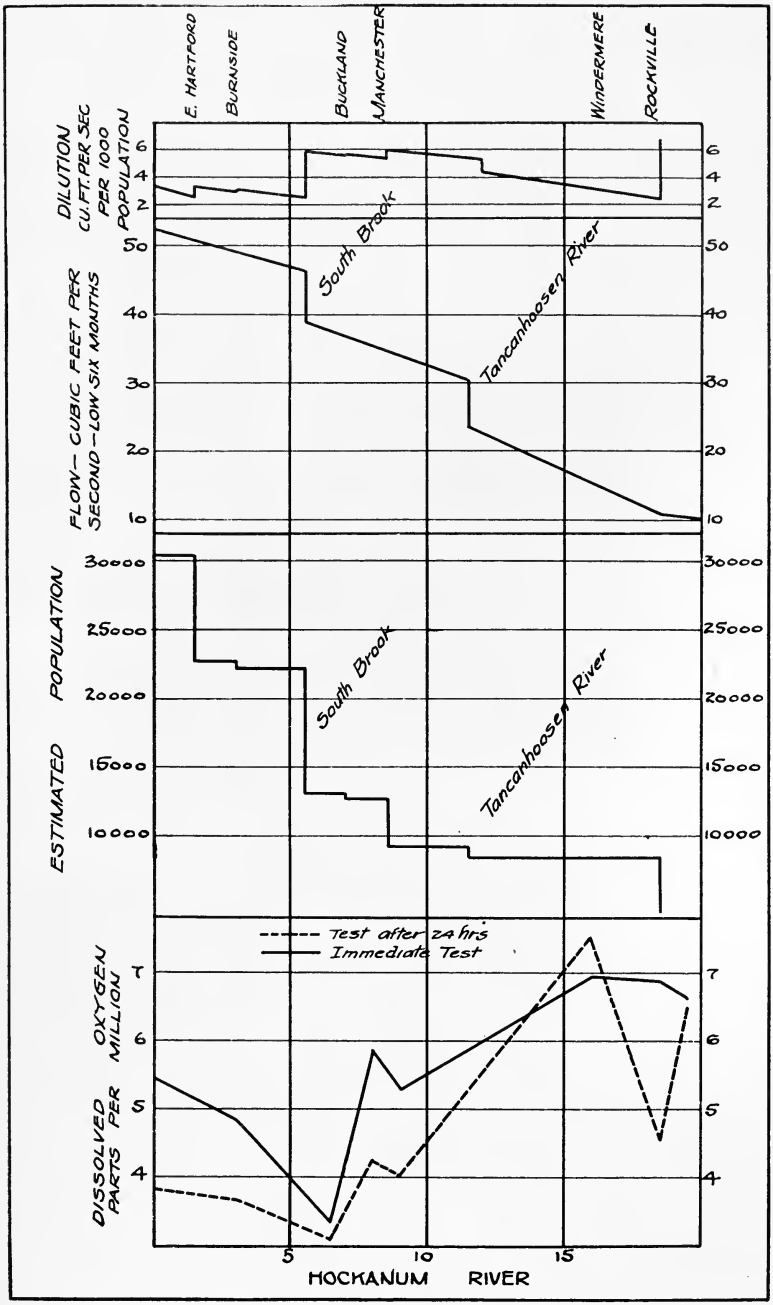
drift. Its principal sources of pollution are the mills at Burnside, South Manchester, Manchester and Rockville. Rockville, Manchester and South Manchester treat their sewage before discharging it into the river. The river does not seem to be very badly polluted except at Burnside and Buckland.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts per Million	Per Cent. Saturation
Mouth	288	11/11	10:30	6	43	2	5.47	43
	A						3.83	30
At Burnside	289	11/11	11:25	6	43	8	4.83	39
	A						3.65	29
Below Buckland	290	11/11	12:40	6	43	1	3.37	24
	A						3.10	24
Below Manchester	296	11/11	5:30	6	43	6	5.84	46
	A						4.28	34
Above Manchester	291	11/11	1:55	6	43	0	5.29	42
	A						4.01	32
Taucanhoosen River below Vernon	292	11/11	2:40	6	43	6	6.66	53
	A						7.11	57
Below Windermere	293	11/11	3:15	6	43	13	6.93	55
	A						7.48	59
At Rockville	294	11/11	3:50	6	43	25	6.84	54
	A						4.56	36
Above Rockville	295	11/11	4:20	6	43	2	6.66	53
	A						6.48	51

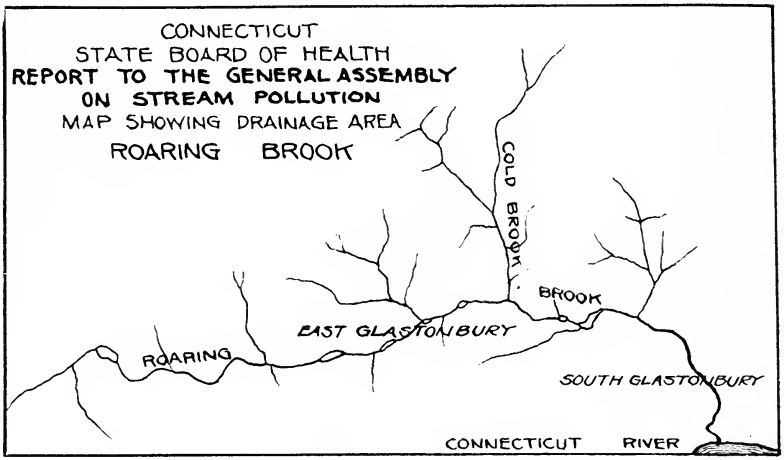
HOCKANUM RIVER AT BURNSIDE.

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures.						
				Silk Mills	Textile Works	Gas Works	Laundries	Paper Works	Soap	Metal Works
East Hartford	8,000	Partial	4,000	..	..	..	..	..	..	..
Burnside	400	Factory	200	..	..	..	..	3	..	1
Buckland	300	Factory	50	..	1	..	..	..	..	..
South Manchester	9,000	Disposal plant	8,000	1	..	..	..	1	1	..
Manchester	3,500	Disposal plant	1,000	..	1	..	..	3	2	3
Talcottville	400	Factory	100	..	2	..	..	..	..	..
Vernon	300	Factory	50	..	1	..	..	..	..	..
Rockville	8,500	Disposal plant	7,000	1	9	1	1	..	..	1
	30,400		20,400	2	14	1	1	7	3	5


E. HARTFORD
BURNSIDE
BUCKLAND
MANCHESTER
WINDERMERE
ROCKVILLE
DILUTION CU. FT. PER SEC PER 1000 POPULATION
FLOW — CUBIC FEET PER SECOND — LOW SIX MONTHS
South Brook
Tancanhoosen River
ESTIMATED POPULATION
South Brook
Tancanhoosen River
Test after 24 hrs
Immediate Test
DISSOLVED OXYGEN PARTS PER MILLION
HOCKANUM RIVER

ROARING BROOK.

Roaring Brook enters the Connecticut from the east at South Glastonbury. It has a drainage area of about 25 square miles. It is a swift stream with many dams and mill ponds on it. It



flows through a rough, hilly country. On the date of the examination the condition was good, except below East Glastonbury where the water was very badly discolored.

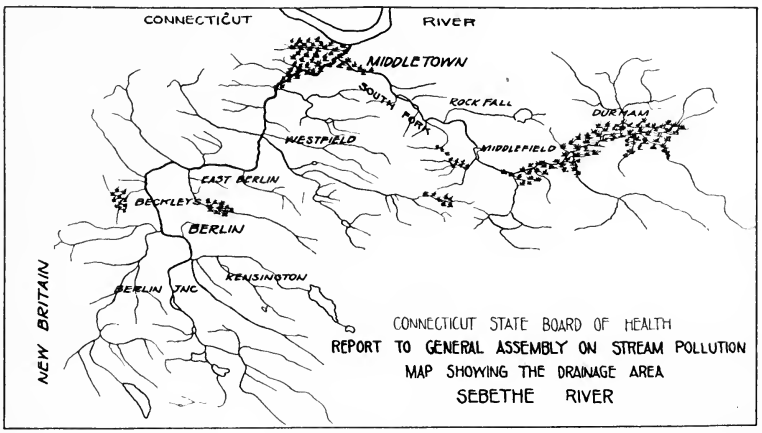
SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts per Million	Per Cent. Saturation
Mouth	351	12/8	11:00	1	34	1	9.02	63
	A						8.45	59
Above South Glastonbury	352	12/8	11:40	1	34	12	9.50	66
	A						12.73	66
Below East Glastonbury	353	12/8	12:30	1	34	2	9.12	64
	A						8.55	60
Above East Glastonbury	354	12/8	1:00	1	34	0	8.83	62
	A						8.17	56

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures: Metal Works	Textile Works	Quarries
South Glastonbury	700	Factory	350	1	..	2
East Glastonbury	500	Factory	200	..	1	..
Total	1,200		550	1	1	2

THE SEBETHE RIVER.

The Sebethe River enters the Connecticut just above Middletown. It has a drainage area of about 113 square miles and is a sluggish stream flowing through meadows, and pasture land. The

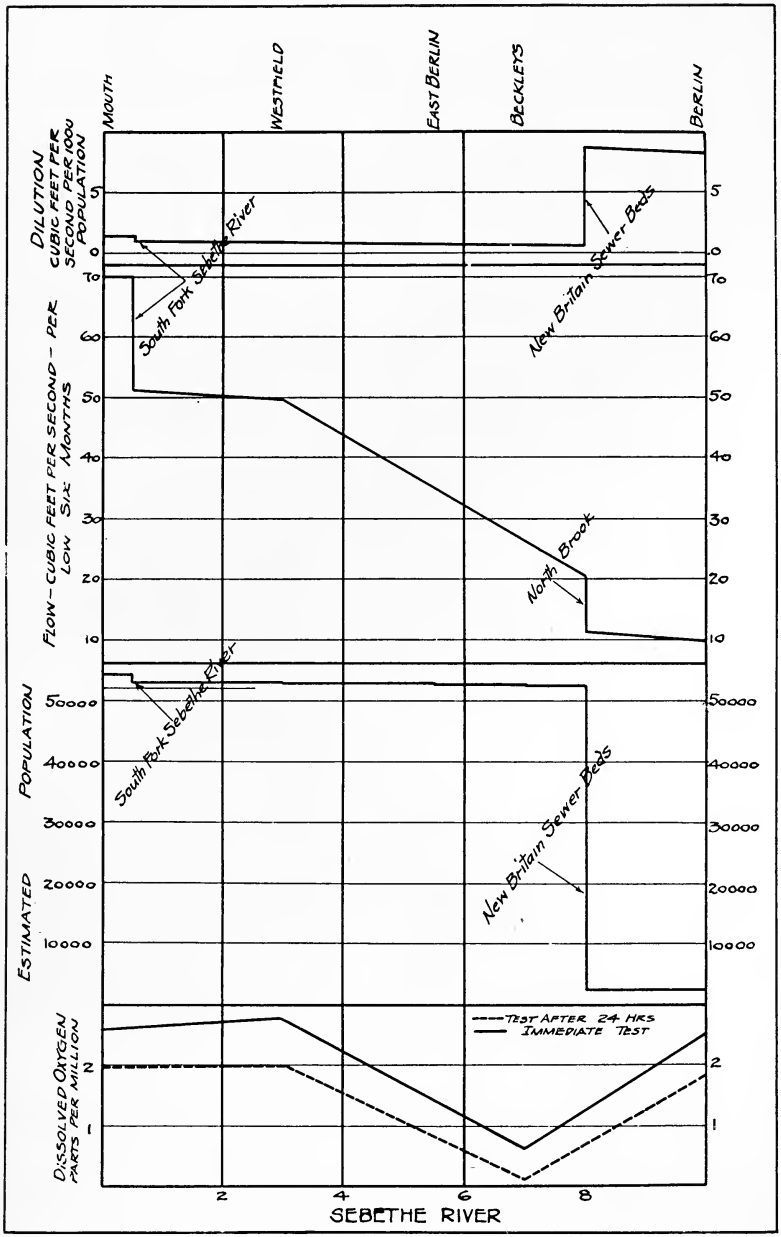


river is badly polluted for its entire length, but is particularly bad at Beckleys, a short distance above which the outlet from the New Britain sewage beds enters the river. The city is contemplating some change in its sewage treatment plant, which will help the condition of the river materially.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

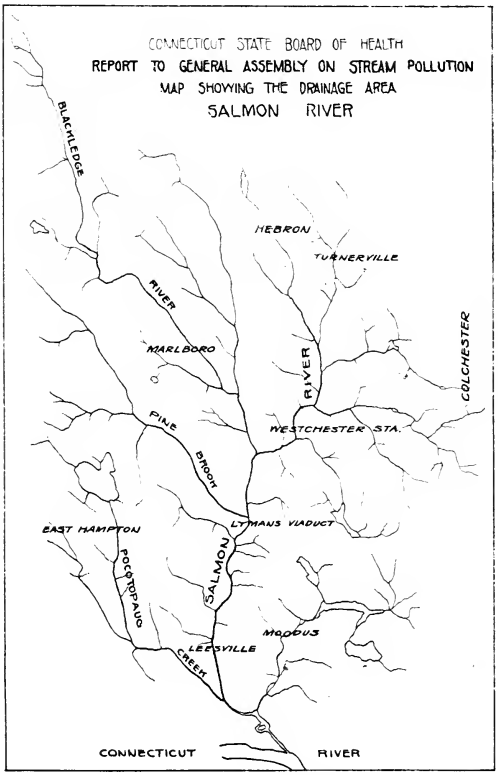
Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	4	7/14	1:40	26	79	2.5	30
	A					1.0	12
At Westfield	1	7/14	10:15	26	79	2.77	33
	A					1.90	23
At Beckleys	2	7/14	10:55	26	79	0.6	7
	A					0.1	1
At Berlin Junction	3	7/14	12:00	26	79	2.5	30
	A					1.8	21

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures: Textile Works	Galvanizing Works	Laundries	Paper Mills	Metal Works	Quarries
New Britain	50,200	Disposal plant	50,000	2	2	2	3	15	..
Berlin	2,000	Partial	1,000	..	..	..	..	..	..
East Berlin	200	Factory	50	..	..	..	..	1	..
Konsington	500	Factory	200	..	..	..	1	3	..
Westfield	100	None	0	..	..	..	..	..	..
Beckleys	100	None	0	..	..	..	..	..	1
Rock Fall	200	Factory	50	1	..	..	..	..	..
Middlefield	300	Factory	50	..	..	..	..	1	..
Durham	600	Factory	50	..	..	..	..	1	..
Total	54,200		51,400	3	2	2	4	21	1


MOUTH
WESTFIELD
EAST BERLIN
BECKLEYS
BERLIN
DILUTION
CUBIC FEET PER SECOND PER 1000 POPULATION
FLOW - CUBIC FEET PER SECOND - PER LOW SIX MONTHS
POPULATION
ESTIMATED
DISSOLVED OXYGEN PARTS PER MILLION
South Fork Sebethe River
New Britain Sewer Beds
North Brook
South Fork Sebethe River
New Britain Sewer Beds
TEST AFTER 24 HRS
IMMEDIATE TEST
SEBETHE RIVER

THE SALMON RIVER.

The Salmon River enters the Connecticut just below Haddam. It has a drainage area of about 71 square miles and is a swift flowing stream with many falls and mill ponds on it. The river does not appear to be polluted except below Westchester Station.



It receives some pollution through Moodus Brook, from the factories at Moodus, also through Pocotopaug River from those at East Hampton. The west branch of the Blackledge River, one of its feeders, appears polluted below Marlboro.

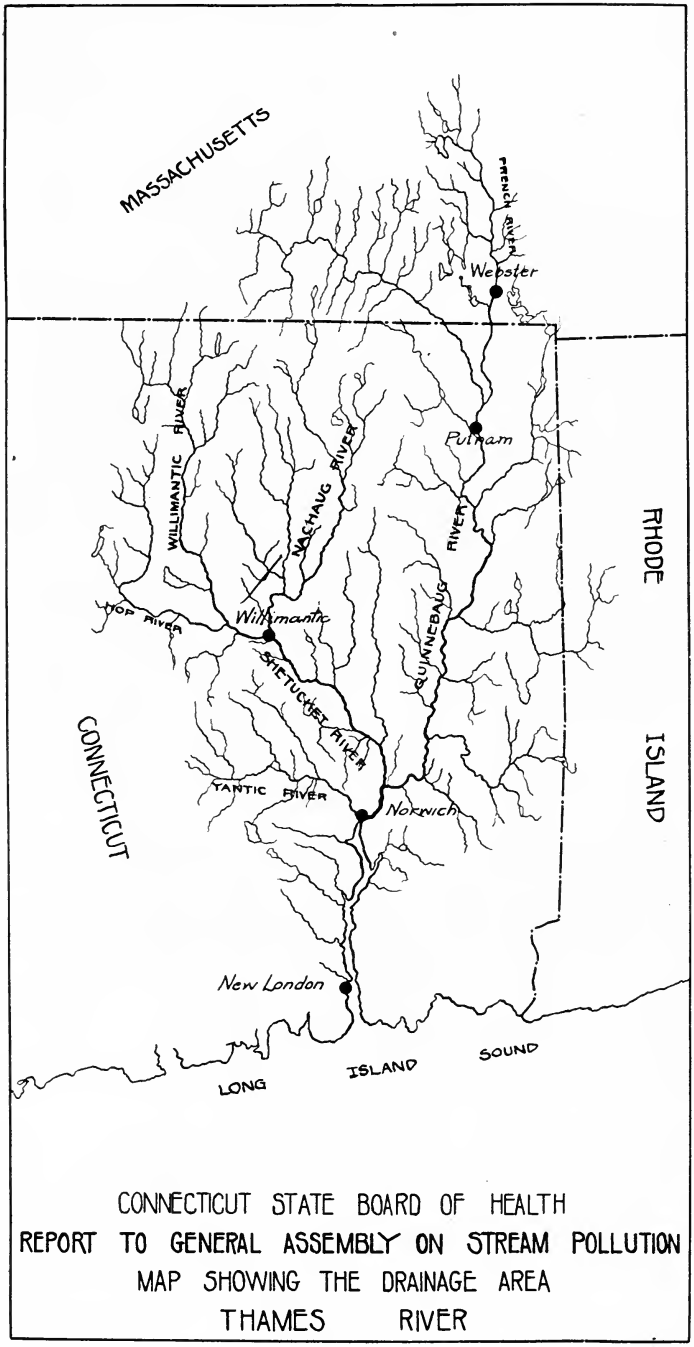
SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	314	11/17	12:15	6	43	0	7.12	57
	A						5.89	47
At Leesville	316	11/17	1:10	5	41	0	5.80	45
	A						6.77	52
Below Lyman Viaduct	322	11/17	4:50	5	41	0	6.77	52
	A						7.65	59
At Westchester station	321	11/17	4:20	5	41	0	4.75	37
	A						8.18	63
At Turnerville	320	11/17	3:35	5	41	0	4.74	59
	A						4.74	59
Below Hebron	319	11/17	3:10	5	41	0	6.33	49
	A						6.00	46

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures: Textile Works	Paper Mills	Metal Works
Moodus	2,000	Factory	1,000	4	..	2
Leesville	100	None	0	..	..	..
Westchester Station	100	None	0	..	..	..
East Hampton	2,000	Factory	1,000	1	1	7
Marlboro	100	None	0	..	..	..
Total	4,300		2,000	5	1	9

MOODUS BROOK.

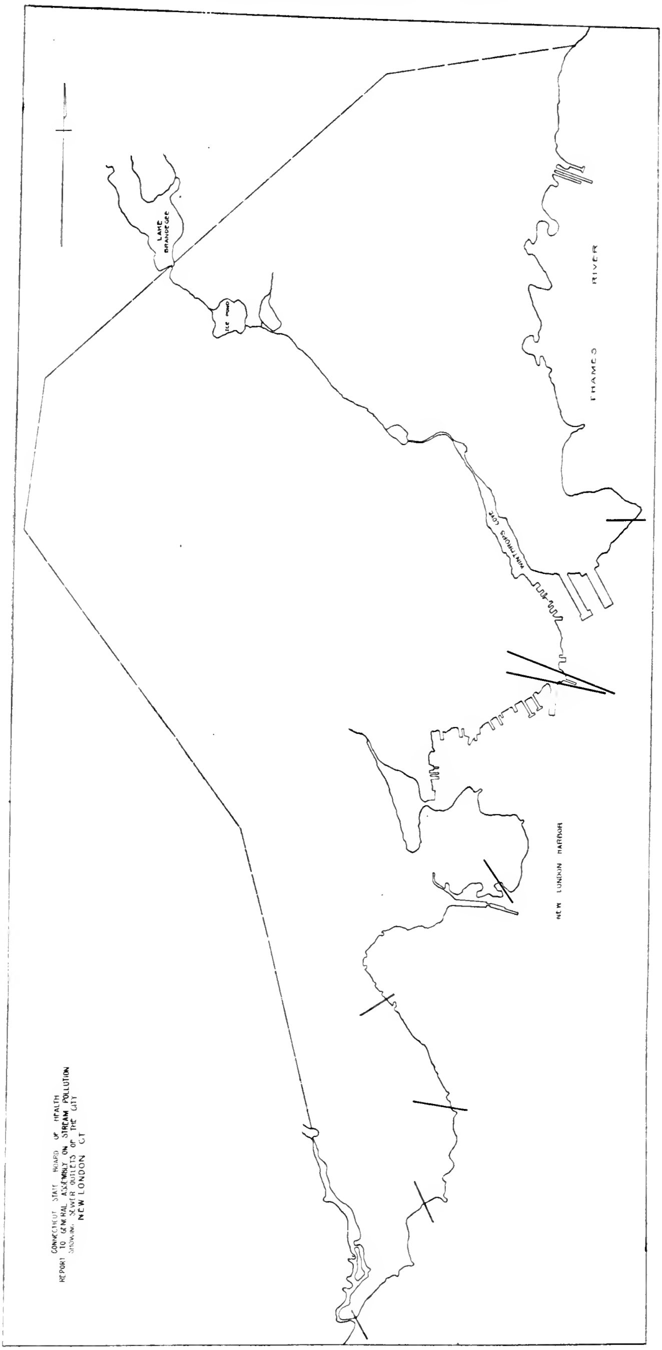
Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Below Moodus	315	11/17	12:40	5	41	0	4.57	35
	A						7.04	55
POCOTOPAUG RIVER.								
Below East Hampton	317	11/17	1:40	7	44	0	5.80	47
	A						5.89	48
WEST BRANCH OF BLACKLEDGE RIVER.								
Below Marlboro	318	11/17	2:20	5	41	0	4.57	35
	A						4.48	35

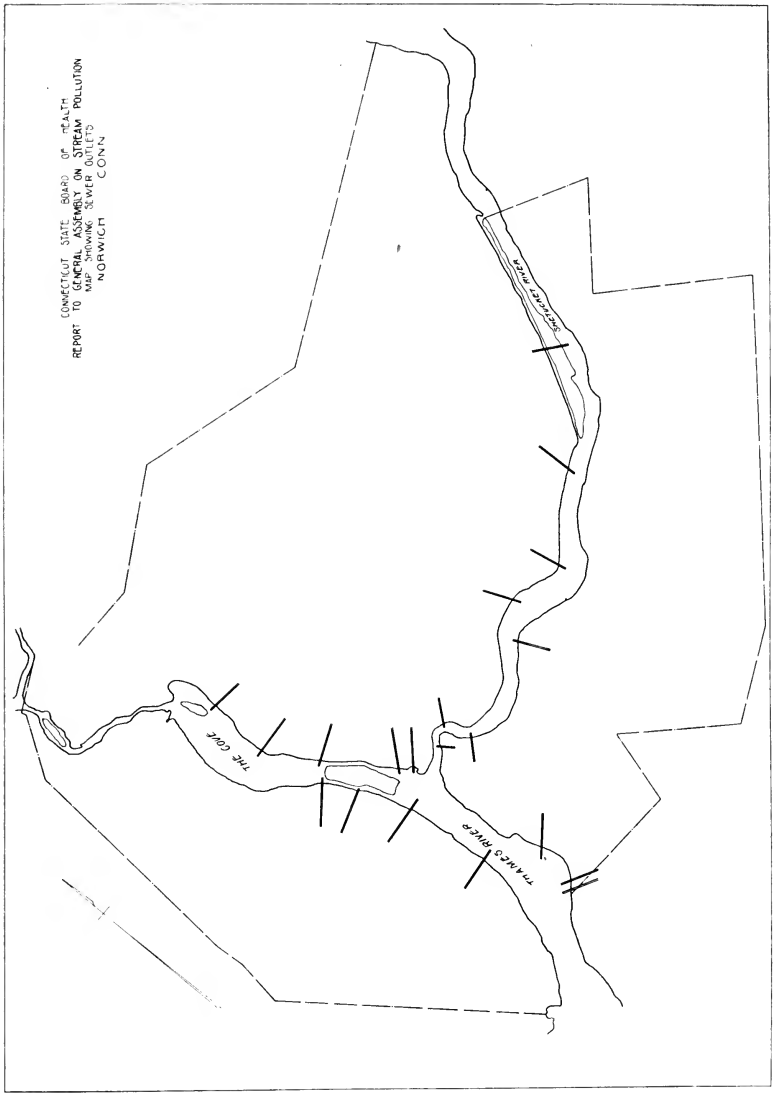


CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING THE DRAINAGE AREA
THAMES RIVER

THE THAMES RIVER.

The Thames River has a drainage area of about 1,407 square miles, and is formed by the confluence of the Shetucket and Yantic Rivers at Norwich. It flows south through a narrow valley, emptying into Long Island Sound at New London. Its other tributaries are the Quinnebaug, French, Nachaug and Willimantic. It is tidal to Norwich, a distance of about 15 miles. From the extreme upper end of its tributaries it has a total fall of about 600 feet in crossing the state. On it are the cities of Montville, Thamesville and Norwich. The volume of the river appears adequate to take care of the sewage and wastes of the towns and factories discharging into it, but the analyses indicate that most of the oxygen in the river is being used to accomplish this and that the amount remaining to support major fish life is not sufficient.

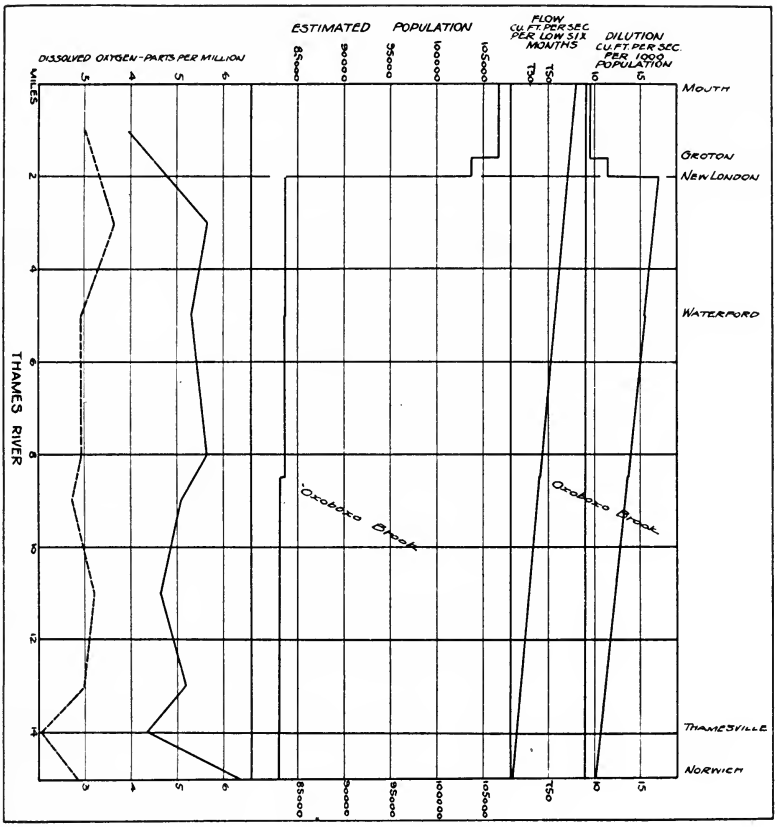

CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
SHOWING SEWER OUTLETS OF THE CITY
NEW LONDON CT
LAKE BRANDEGEE
ICE POND
THAMES RIVER
WINTHROPS COVE
NEW LONDON HARBOR


CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING SEWER OUTLETS
NORWICH CONN
THE COVE
THAMES RIVER

SAMPLING STATIONS AND DISSOLVED OXYGEN.

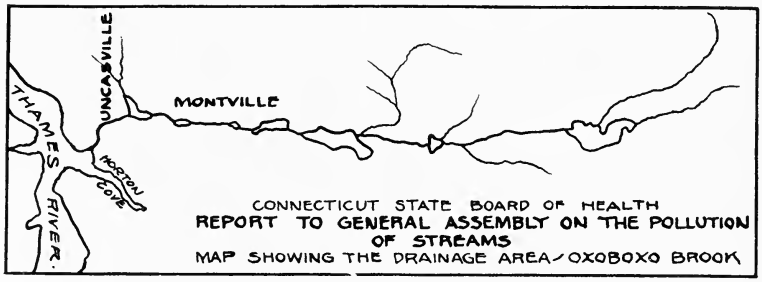
Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	102	8/13	10:30	23	73	4	3.96	45.6
	A						3.2	36.9
Above R. R. Bridge, New London	103	8/13	10:50	23	73	5	5.65	65.2
	A						3.66	41.5
Opposite Mamacoke Hill	104	8/13	11:00	23	73	9	5.28	60.7
	A						2.92	33.9
Below Montville	105	8/13	11:10	23	73	27	5.65	65.1
	A						2.94	33.9
Above Allyn Point	106	8/13	11:20	23	73	14	5.09	58.5
	A						2.73	31.4
Opposite Poquetanuck Cove	107	8/13	11:45	23	73	7	4.62	53.4
	A						3.2	36.4
Opposite Trading Cove	108	8/13	11:55	23	73	0	5.18	59.7
	A						3.01	34.8
Below Thamesville	109	8/13	12:05	23	73	2	4.33	49.9
	A						2.07	23.9
Junction of Shetucket and Yantic Rivers at Norwich	110	8/13	12:15	23	73	0	6.32	73.1
	A						2.82	32.5

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures. Silk Mills	Textile Works	Galvanizing Works	Laundries	Paper Mills	Metal Works
New London	20,503	Complete	20,500	2	2	..	4	1	9
Groton	3,000	Partial	1,500	..	..	..	..	..	..
Waterford	200	Factory	50	..	..	..	..	2	..
Norwich (part)	6,000	Complete	5,000	..	..	2	..	1	2
Total	29,703		27,050	2	2	2	4	4	11


DISSOLVED OXYGEN-PARTS PER MILLION
ESTIMATED POPULATION
FLOW CU. FT. PER SEC. PER LOW SIX MONTHS
DILUTION CU. FT. PER SEC. PER 1000 POPULATION
MILES
THAMES RIVER
MOUTH
GROTON
NEW LONDON
WATERFORD
THAMESVILLE
NORWICH
Oxoboxo Brook
Oxoboxo Brook

OXOBOXO BROOK.

Oxoboxo Brook enters the Thames River from the west at Uncasville. It has a drainage area of about 15 square miles. It is a rapid flowing stream and runs through a very hilly country. On it are several dams and mill ponds. The river shows signs of pollution at Uncasville and below Montville where it is considerably discolored.



SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth at Uncasville	312	11/13	3:00	6	43	3	4.46	35
	A						3.81	30
At Montville	313	11/13	3:30	6	43	15	6.51	52
	A						6.33	50

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures: Textile Works	Paper Mills	Tanneries
Uncasville	300	Factory	50	1	..	1
Montville	300	Factory	200	3	2	..
Total	600		250	4	2	1

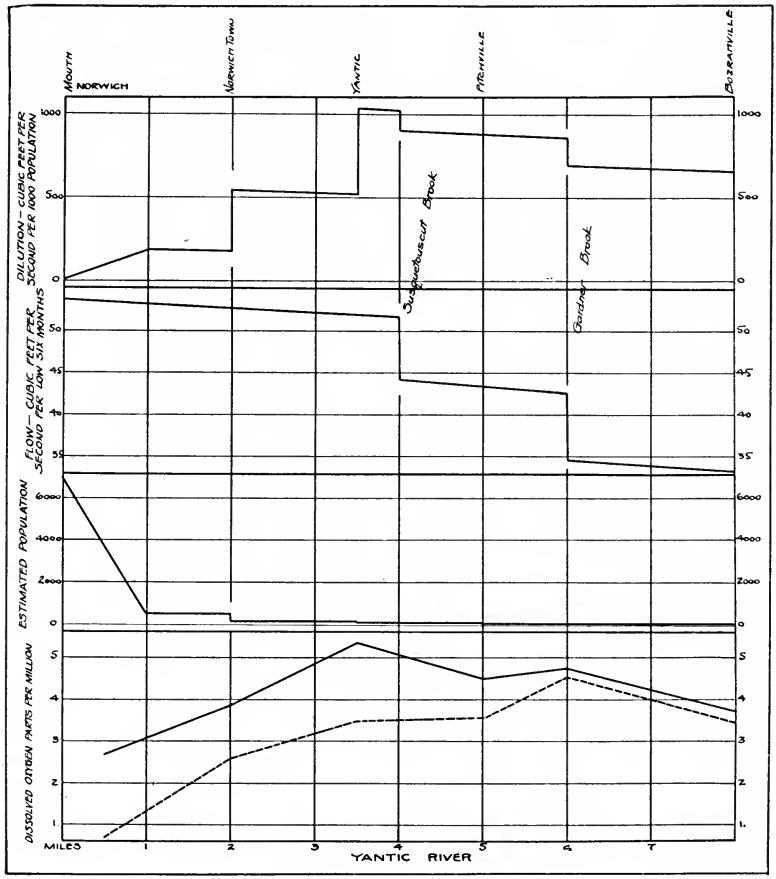
THE YANTIC RIVER.

The Yantic has a drainage area of about 98 square miles and flows through a region of farm and pasture lands. The river is badly polluted along the city of Norwich, but more especially at the so-called "Norwich Dump," where garbage, ashes and refuse are deposited. It also receives some pollution from the factories at Yantic, Fitchville and Bozrahville.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Dump in Upper Norwich.....	111	8/14	9:30	26	79	5	2.67	32.5
	A						.669	8.1
Below Norwich Town above Falls.	112	8/14	9:50	26	79	3	3.82	46.5
	A						2.58	31.4
At Yantic	113	8/14	10:10	26	79	4	5.35	65.0
	A						3.44	41.0
Below Fitchville	114	8/14	10:30	26	79	0	4.49	54.0
	A						3.53	42.0
Above Fitchville	115	8/14	10:50	26	79	0	4.78	58.0
	A						4.49	54.0
Below Bozrahville	116	8/14	11:15	26	79	1	3.72	45.0
	A						3.44	41.0

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures: Silk Mills	Textile Works	Paper Mills	Tanneries	Metal Works
Norwich (part)	6,000	Complete	5,000	1	3	..	1	2
Norwich Town	500	None	200	..	..	..	..	..
Yantic	200	Factory	50	..	1	..	..	..
Fitchville	100	None	0	..	..	..	..	..
Bozrahville	100	Factory	50	..	1	1	..	..
Total	6,900		5,300	1	5	1	1	2


MOUTH
NORWICH
NORWICH TOWN
YANTIC
PACHAUG
BOZRAHVILLE
DILUTION - CUBIC FEET PER SECOND PER 1000 POPULATION
FLOW - CUBIC FEET PER SECOND PER LOW SIX MONTHS
ESTIMATED POPULATION
DISSOLVED OXYGEN PARTS PER MILLION
Jodgeebuscut Brook
Gardner Brook
MILES
YANTIC RIVER

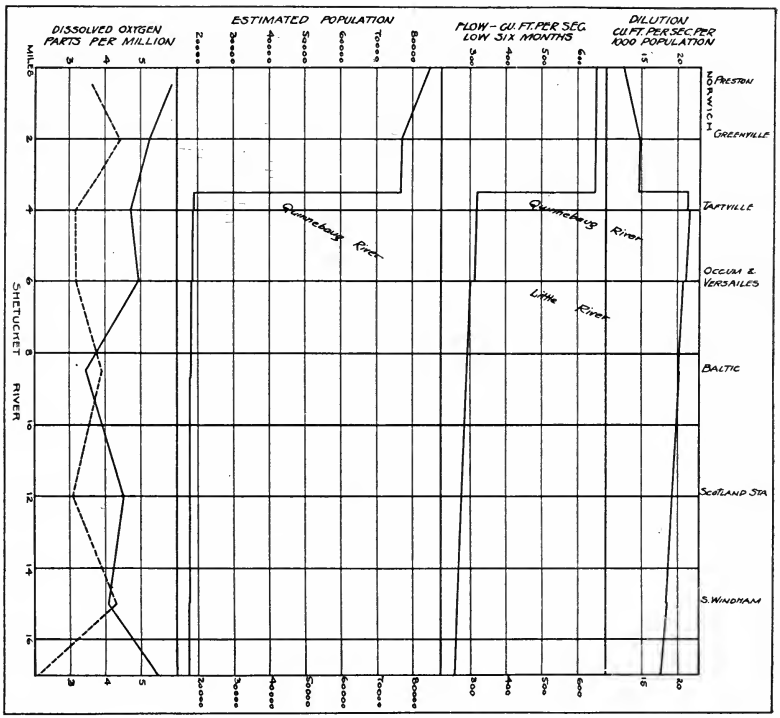
THE SHETUCKET RIVER.

The Shetucket River at its junction with the Yantic River. forms the Thames. It has a drainage area of about 1,200 square miles, is 50 miles in length and a very swift stream, flowing through a region of crystalline rock formation. Its principal sources of pollution are Greenville, Taftville, Occum, Versailles and Baltic. It also receives some pollution through the Quinnebaug and Willimantic Rivers. In spite of this the conditions of the river as shown by the analyses is fair. This may be partly accounted for by the falls and mill ponds on it, which afford a chance for purification through aeration and sedimentation.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts per Million	Per Cent. Saturation
At Preston	119	8/14	11:50	26	79	1	5.87	71
	A						3.63	44
At Greenville	118	8/14	12:15	26	79	0	5.25	63
	A						4.39	53
Below Junction with Quinnebaug	117	8/14	12:30	26	79	21	4.97	60
	A						3.82	46
Below Taftville	85	8/7	1:20	24	75	2	4.72	54
	A						3.18	37
Below Occum and Versailles	84	8/7	1:10	24	75	8	4.9	57
	A						3.18	37
Below Baltic	83	8/7	12:50	24	75	5	3.9	45
	A						3.45	44
Above Scotland Station	82	8/7	12:10	24	75	0	4.54	53
	A						3.09	36
Opposite South Windham	81	8/7	11:15	24	75	0	4.09	47
	A						4.27	50
Opp. Prospect Hill below Willimantic	80	8/7	11:00	24	75	12	5.45	63
	A						2.09	24

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures. Silk Mills	Textile Works	Gas Works	Laundries	Paper Mills	Saw Mills	Tanneries	Metal Works
Norwich (part)	8,000	Complete	8,000	2	13	1	4	3	..	1	5
Taftville	300	Partial	200	..	1	..	..	..	..	..	..
Versailles	400	None	300	..	2	..	..	1	..	..	..
Occum	100	None	0	..	..	..	..	..	..	..	..
Baltic	400	Partial	200	..	1	..	..	..	..	..	1
South Windham	300	None	100	..	..	..	..	..	1	..	1
Total	9,500		8,800	2	17	1	4	4	1	1	7


DISSOLVED OXYGEN
PARTS PER MILLION
ESTIMATED POPULATION
FLOW - CU. FT. PER SEC.
LOW 3 IX MONTHS
DILUTION
CU FT. PER SEC. PER
1000 POPULATION
MILES
SHETUCKET RIVER
N. PRESTON
NORWICH
GREENVILLE
TAFTVILLE
OCCUM & VERSAILES
BALTIC
SCOTLAND STA.
S. WINDHAM
Quinebaug River
Quinebaug River
Little River

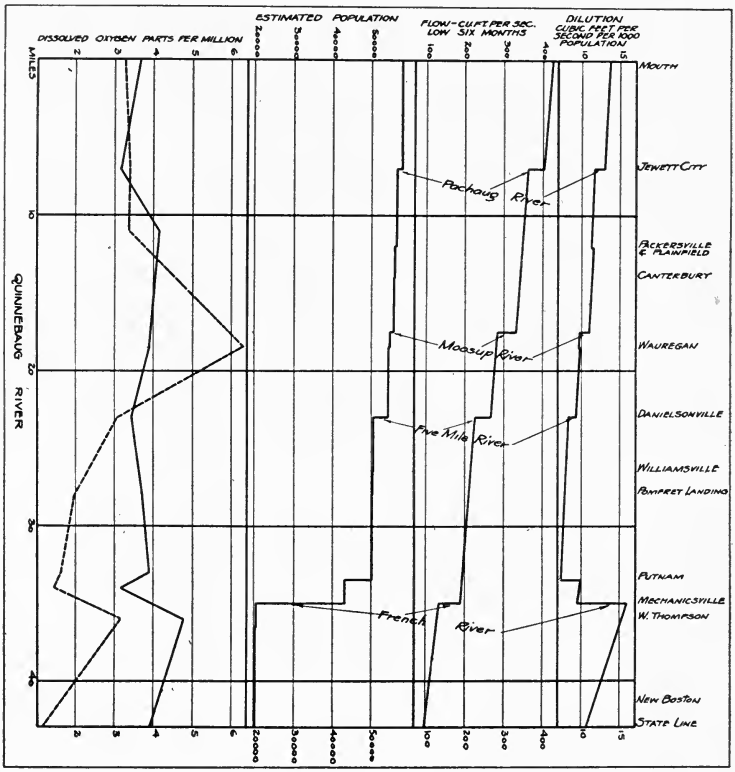
THE QUINNEBAUG RIVER.

The Quinnebaug River enters the Shetucket from the east below Taftville. It has a drainage area of about 688 square miles, of which about 265 square miles lie in Massachusetts. It is a swift flowing stream through broad valleys of crystalline rock formation. On it are the towns of Greenville, Jewett City, Packersville, Danielsonville, Wauregan, Putnam, Mechanicsville, Grosvenordale, North Grosvenordale and New Boston in Connecticut and West Dudley, Saundersdale, and Southbridge in Massachusetts. The river is considerably polluted by the factories at Jewett City, Packersville, Canterbury and Wauregan, and from the sewerage systems of Danielsonville and Putnam. In Massachusetts the towns of Southbridge and West Dudley empty their sewage and factory waste into it.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

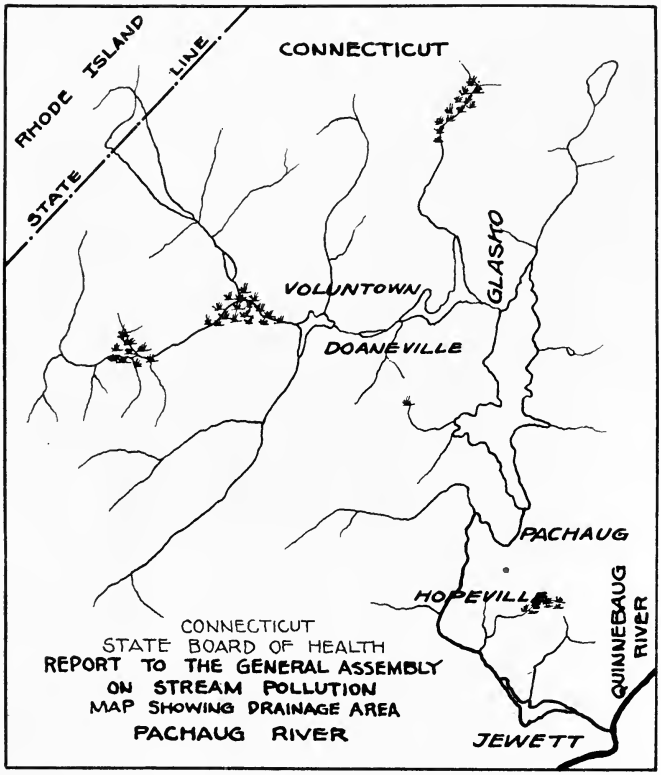
Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	86	8/7	1:40	24	75	33	3.63	42.6
	A						3.27	37.4
At Jewett City	87	8/7	2:20	24	75	4	3.18	37.3
	A						3.99	46.8
Below Packersville	88	8/7	2:45	24	75	9	4.17	48.7
	A						3.36	39.2
At Wauregan	90	8/7	3:50	24	75	0	3.9	45.7
	A						6.27	73.5
Above Five Mile River at Danielsonville	91	8/10	10:45	26	79	4	3.42	41.6
	A						3.04	36.9
At Pomfret Landing	94	8/10	11:45	25	77	22	3.71	44.2
	A						1.99	23.7
Below Putnam	95	8/10	12:30	25	77	5	3.9	46.5
	A						1.61	19.2
Above Putnam	96	8/10	1:15	24	75	4	3.14	36.8
	A						1.42	16.7
Above French River	98	8/10	2:00	26	79	12	4.78	58.1
	A						3.13	38.1
At State Line	100	8/10	2:45	26	79	0	3.89	47.3
	A						1.14	13.9

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures. Silk Mills	Textile Works	Dye Works	Gas Works	Laundries	Paper Mills	Tanneries	Metal Works
Jewett City	300	Factory	200	..	3	1	..	..	..	..	..
Packersville	100	Factory	50	..	1	..	..	..	..	..	..
Plainfield	500	Factory	300	..	1	..	..	..	..	..	..
Canterbury	100	None	0	..	..	..	..	..	..	..	..
Wauregan	600	Partial	300	..	..	..	..	..	..	..	..
Danielsonville	2.500	Partial	1,500	..	3	..	1	1	..	..	2
Williamsville	50	None	0	..	..	..	..	..	..	..	..
Pomfret Landing	50	None	0	..	..	..	..	..	..	..	..
Putnam	7,280	Partial	7,000	5	6	..	1	1	1	1	3
West Thompson	100	None	0	..	..	..	..	..	..	..	..
Mechanicsville	500	None	300	..	..	..	..	..	..	..	..
New Boston	100	None	0	..	..	..	..	..	..	..	..
Total	12,180		9,650	5	14	1	2	2	1	1	5



THE PACHAUG RIVER.

The Pachaug River enters the Quinnebaug from the east at Jewett City. It has a drainage area of about 60 square miles.

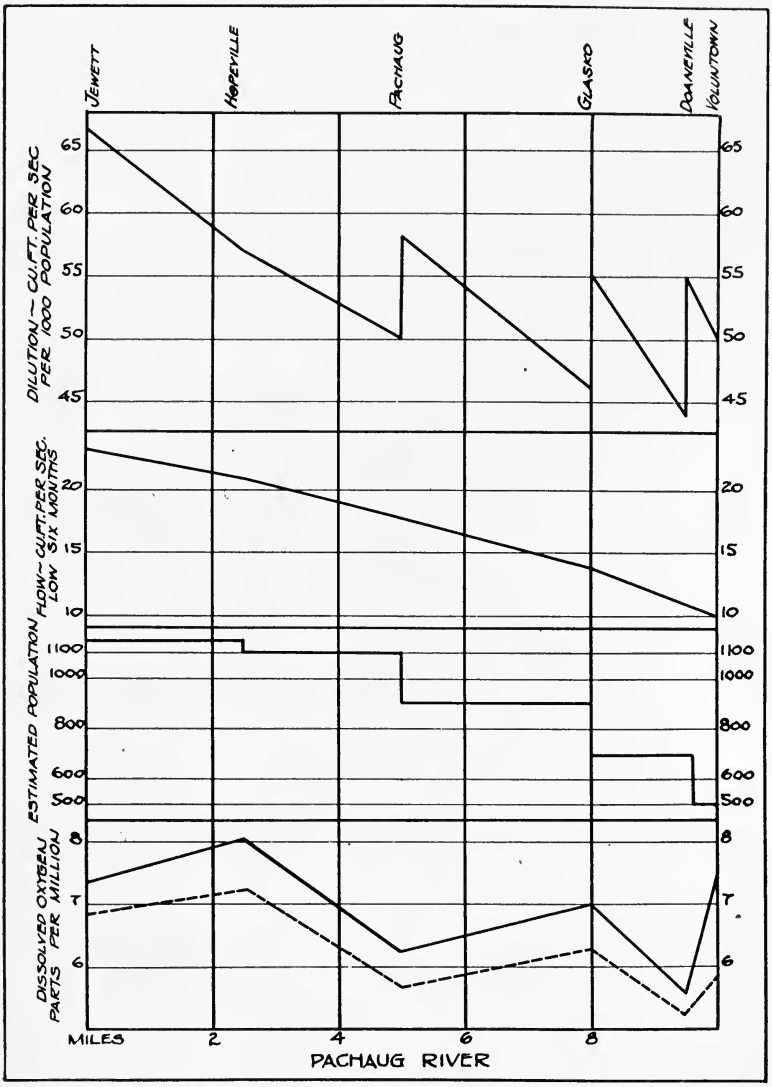


It is a rather swift stream flowing through a rough, hilly country. On it are several dams and mill ponds. The river receives pollution at Voluntown and Glasko, but at the time of the examination seemed in very fair condition.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

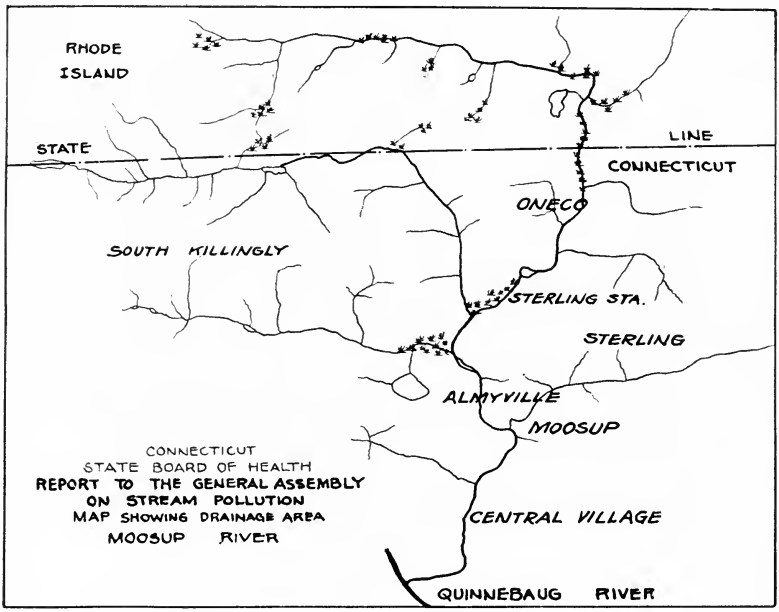
Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	306	11/13	8:45	6	43	7	7.39	59
	A						6.84	54
At Hopeville	307	11/13	9:20	6	43	5	8.03	64
	A						7.21	57
At Pachaug	308	11/13	9:55	6	43	2	6.23	49
	A						5.67	45
At Glasko	309	11/13	10:30	6	43	4	6.98	55
	A						6.14	49
At Doaneville	310	11/13	11:00	6	43	8	5.49	43
	A						5.21	41
At Voluntown	311	11/13	11:15	6	43	0	7.54	60
	A						5.86	46

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures Textile Works
Hopeville	50	None	0	..
Pachaug	200	Factory	50	..
Glasko	200	Factory	50	1
Doaneville	200	Factory	50	..
Voluntown	500	Factory	200	1
Total	1,150		350	2


JEWETT
HOPEVILLE
PACHAUG
GLASKO
DANIELLE
VOLUNTOWN
DILUTION — CU.FT. PER SEC. PER 1000 POPULATION
65
60
55
50
45
FLOW — CU.FT. PER SEC. LOW SIX MONTHS
20
15
10
ESTIMATED POPULATION
1100
1000
800
600
500
DISSOLVED OXYGEN PARTS PER MILLION
8
7
6
MILES
2
4
6
8
PACHAUG RIVER

THE MOOSUP RIVER.

The Moosup River enters the Quinnebaug from the east about one mile below Wauregan. It has a drainage area of about 68



square miles, part of which lies in Rhode Island. It is a very rapid stream with several dams and mill ponds on it. The river is polluted in its lower part, probably by wastes from Moosup and Central Village.

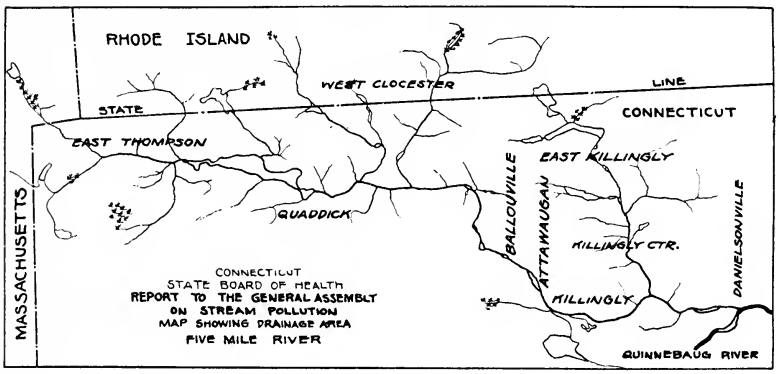
SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Central Village	89	8/7	3:45	24	75	10	3.81	44.7
	A						4.81	56.4

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures Textile Works
Central Village	300	Factory	200	3
Almyville	100	None	0	..
Moosup	400	Factory	200	3
Oneco	200	None	0	..
Total	1,000		400	6

THE FIVE MILE RIVER.

The Five Mile River enters the Quinnebaug from the east at Danielsonville. It has a drainage area of about 76 square miles



and is a rather rapid stream flowing through a hilly woodland region. The river receives some pollution at Killingly and becomes worse at Danielsonville.

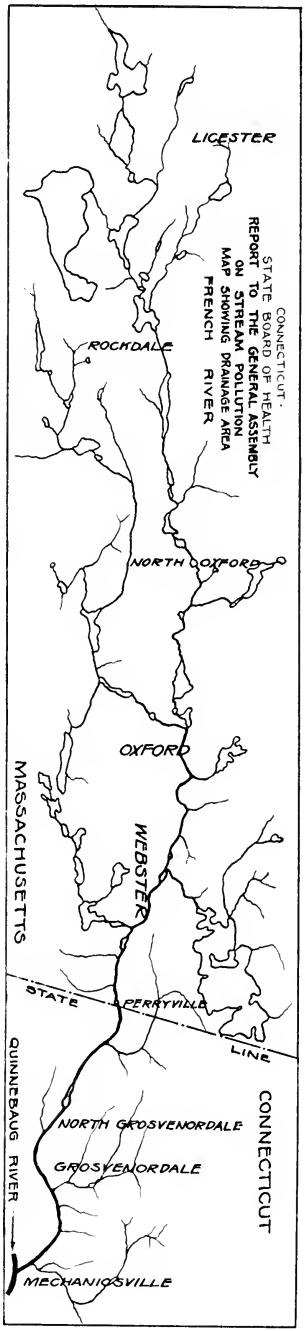
SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	92	8/10	11:00	26	79	0	2.95	36.2
	A						1.80	21.9
At Killingly	93	8/10	11:25	23	73	2	4.76	50.0
	A						4.95	51.4

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures: Textile Works	Statistics of Manufactures: Dye Works
Killingly	600	Private	300	..	..
Dayville	100	Factory	50	1	..
East Killingly	400	Factory	200	1	1
Attawaugan	100	Factory	50	1	..
Ballouville	100	Factory	50	1	..
Quaddick	100	None	0	..	..
East Thompson	200	None	0	..	..
Total	1,600		650	4	1

THE FRENCH RIVER.

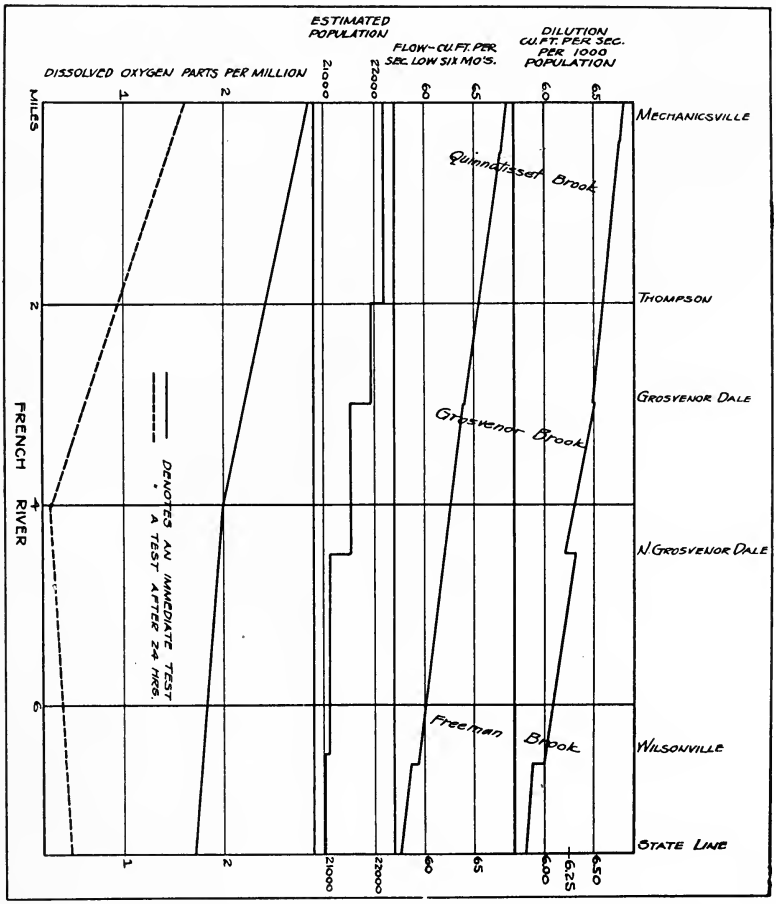
The French River enters the Quinnebaug from the east at Mechanicsville. It has a drainage area of about 70 square miles, 30 square miles being in Massachusetts. It is a very rapid stream and has many dams and mill ponds on it. It flows through a hilly region of crystalline rock formation. The river is badly polluted for its entire length but more particularly below North Grosvenordale and the State Line. The conditions at the State Line are probably due to the towns of Ferryville, Webster, Leicester, Oxford, Charlton and Dudley in Massachusetts. All of these towns have one or more textile factories which discharge large quantities of liquid wastes, besides the sewage from their employees. The town of Leicester treats its sewage, Webster and Dudley discharge theirs untreated into the river.


CONNECTICUT.
STATE BOARD OF HEALTH
REPORT TO THE GENERAL ASSEMBLY
ON STREAM POLLUTION
MAP SHOWING DRAINAGE AREA
FRENCH RIVER
LEICESTER
ROCKDALE
NORTH OXFORD
OXFORD
WEBSTER
MASSACHUSETTS
STATE
LINE
PERRYVILLE
QUINNEBAUG RIVER
NORTH GROSVENORDALE
GROSVENORDALE
MECHANICSVILLE
CONNECTICUT

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	97	8/10	1:40	24	75	5	2.85	33.4
	A						1.61	18.9
Below North Grosvenordale	99	8/10	2:15	26	79	1	1.99	24.2
	A						0.285	3.47
At State Line	101	8/10	3:30	26	79	3	1.71	20.4
	A						0.476	5.79

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures Textile Works
Thompson	300	None	0	..
Grosvernordale	400	None	100	..
North Grosvernordale	400	Factory	200	1
Wilsonville	100	None	0	..
Total	1,200		300	1


ESTIMATED POPULATION
DILUTION CU.FT. PER SEC. PER 1000 POPULATION
FLOW-CU.FT. PER SEC. LOW SIX MO'S.
DISSOLVED OXYGEN PARTS PER MILLION
MILES
FRENCH RIVER
MECHANICSVILLE
THOMPSON
GROSVENOR DALE
N GROSVENOR DALE
WILSONVILLE
STATE LINE
Quinnatisset Brook
Grosvenor Brook
Freeman Brook
DENOTES AN IMMEDIATE TEST
A TEST AFTER 24 HRS.
1
2
6
21000
22000
60
65
6.00
6.25
6.50

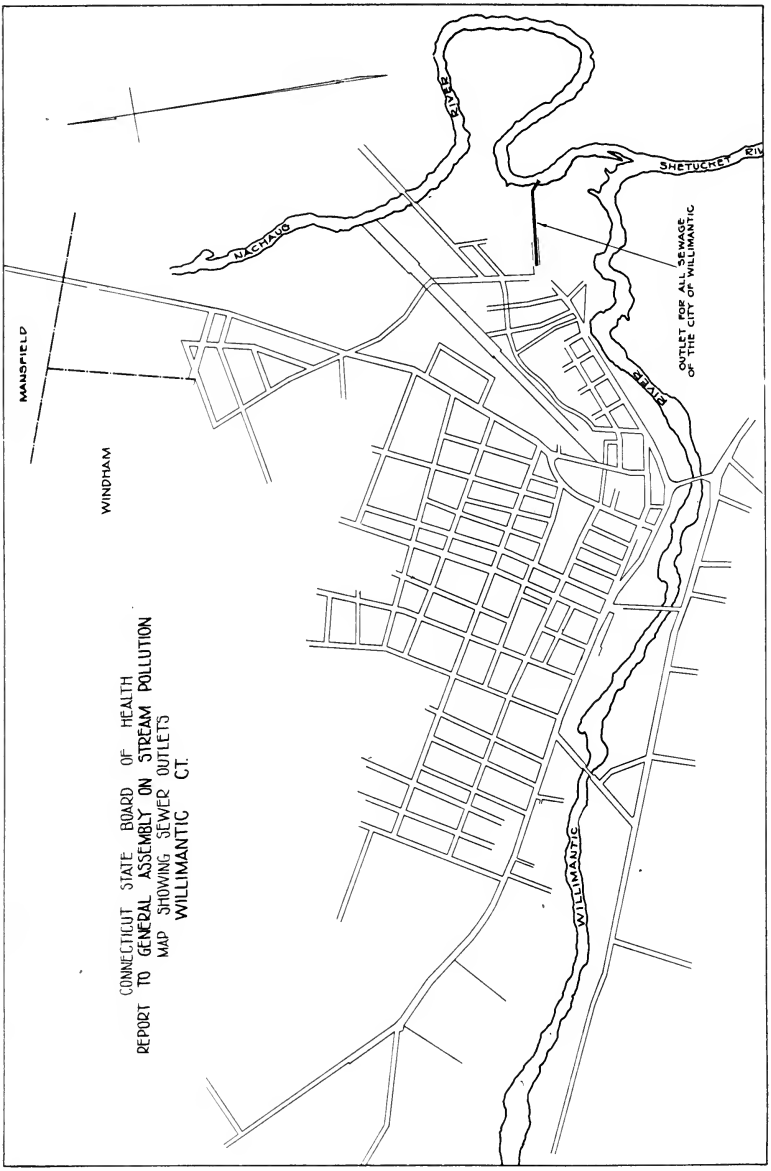
THE NACHAUG RIVER AND TRIBUTARIES.

The Nachaug River has a drainage area of about 165 square miles and flows through a broad valley encircled by hills. On its tributaries are many dams and mill ponds. A dam three miles above Willimantic forms a storage reservoir for supplying the city with water. The sewer outlets of the city discharge into the river above its junction with the Willimantic and pollute it badly. It also receives some pollution at Mansfield Hollow, North Windham and Phoenixville.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	79 A	8/7	10:45	24	75	12	4.81 4.99	56 58

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures. Silk Mills	Jewelry Works
Mansfield Hollow	100	Factory	50	..	1
North Windham	400	Factory	200	1	..
Chaplin	50	None	0	..	..
Chaffeeville	50	None	0	..	..
Hank Hill	100	Factory	50	1	..
Gurleyville	100	Factory	50	1	..
East Willington	100	None	0	..	..
Phoenixville	100	Factory	50	..	..
Eastford	200	None	0	..	..
Kenyonville	50	None	0	..	..
North Ashford	50	None	0	..	..
Total	1,200		400	3	1


MANSFIELD
WINDHAM
MACHAUG
RIVER
SHETUCKET RIV
OUTLET FOR ALL SEWAGE OF THE CITY OF WILLIMANTIC
WILLIMANTIC
RIVER
CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING SEWER OUTLETS
WILLIMANTIC CT.

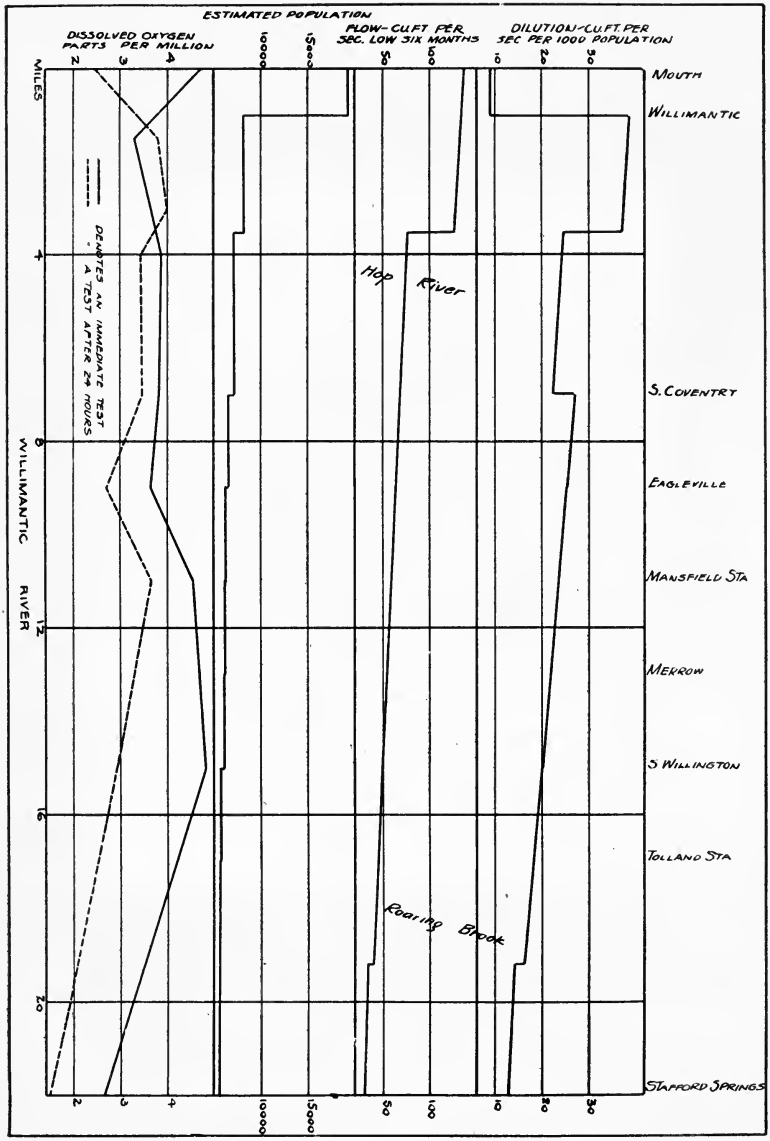
THE WILLIMANTIC RIVER.

The Willimantic River combines with the Nachaug and forms the Shetucket just below the city of Willimantic. It has a drainage area of about 223 square miles, is 35 miles long and flows swiftly through a broad open valley. The principal sources of pollution are the city of Willimantic and the towns of South Coventry, Eagleville, Mansfield Depot, South Willington and Stafford Springs. The river is badly polluted at Willimantic and just below Stafford Springs where the water is slightly discolored by dyes from the mills.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

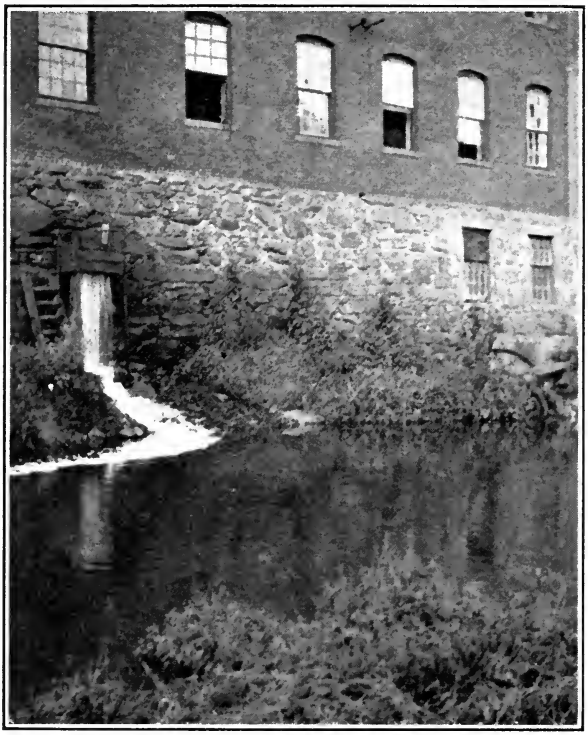
Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	78	8/7	10:30	25	77	3	4.72	55
	A						2.45	28
Above Highway Bridge, Willimantic	65	8/6	10:30	25	77	20	3.3	39
	A						3.81	45
Above Willimantic below Hop River	66	8/6	10:45	25	77	7	3.63	43
	A						3.99	47
Above Hop River	67	8/6	11:00	25	77	5	3.86	45
	A						3.45	41
At South Coventry	68	8/6	11:30	25	77	6	3.81	45
	A						3.45	41
At Eagleville	69	8/6	11:40	25	77	4	3.63	43
	A						2.72	32
At Mansfield Depot	70	8/6	11:55	25	77	6	4.54	54
	A						3.63	43
At South Willington	71	8/6	12:10	25	77	11	4.81	57
	A						2.91	34
Below Stafford Springs	72	8/6	1:00	25	77	19	2.63	31
	A						1.45	17

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures: Silk Mills	Textile Works	Gas Works	Laundries	Paper Mills	Metal Works
Willimantic	11,278	Partial	11,200	6	2	1	2	..	2
South Coventry	800	Factory	600	3	1	..	..	2	..
Eagleville	200	Factory	50	..	1	..	..	..	..
Mansfield Station	100	None	0	..	..	..	..	..	..
Merrow	100	None	0	..	..	..	..	..	..
South Willington	300	Factory	50	..	1	..	..	..	..
Tolland Station	100	None	0	..	..	..	..	..	..
Stafford Springs	3,000	Partial	2,000	..	7	..	..	1	..
Total	15,878		13,900	9	12	1	2	3	2


ESTIMATED POPULATION
DISSOLVED OXYGEN PARTS PER MILLION
FLOW-CU.FT. PER SEC. LOW SIX MONTHS
DILUTION-CU.FT. PER SEC PER 1000 POPULATION
MILES
DENOTES AN IMMEDIATE TEST
A TEST AFTER 24 HOURS
WILLIMANTIC RIVER
Hop River
Roaring Brook
MOUTH
WILLIMANTIC
S. COVENTRY
EAGLEVILLE
MANSFIELD STA
MERROW
S WILLINGTON
TOLLAND STA
STAFFORD SPRINGS

MIDDLE RIVER, SQUARE POND BROOK, FURNACE BROOK.

Square Pond Brook, Middle River and Furnace Brook unite to form the Willimantic. Their total drainage area is about 50 square miles. They are swift streams flowing through a hilly



FURNACE BROOK, STAFFORD.

country. Middle River receives some pollution from the factories at Orcuttville and Square Pond Brook from those at West Stafford. Furnace Brook is very badly polluted below Stafford by the dyes and wastes from a large woolen mill.

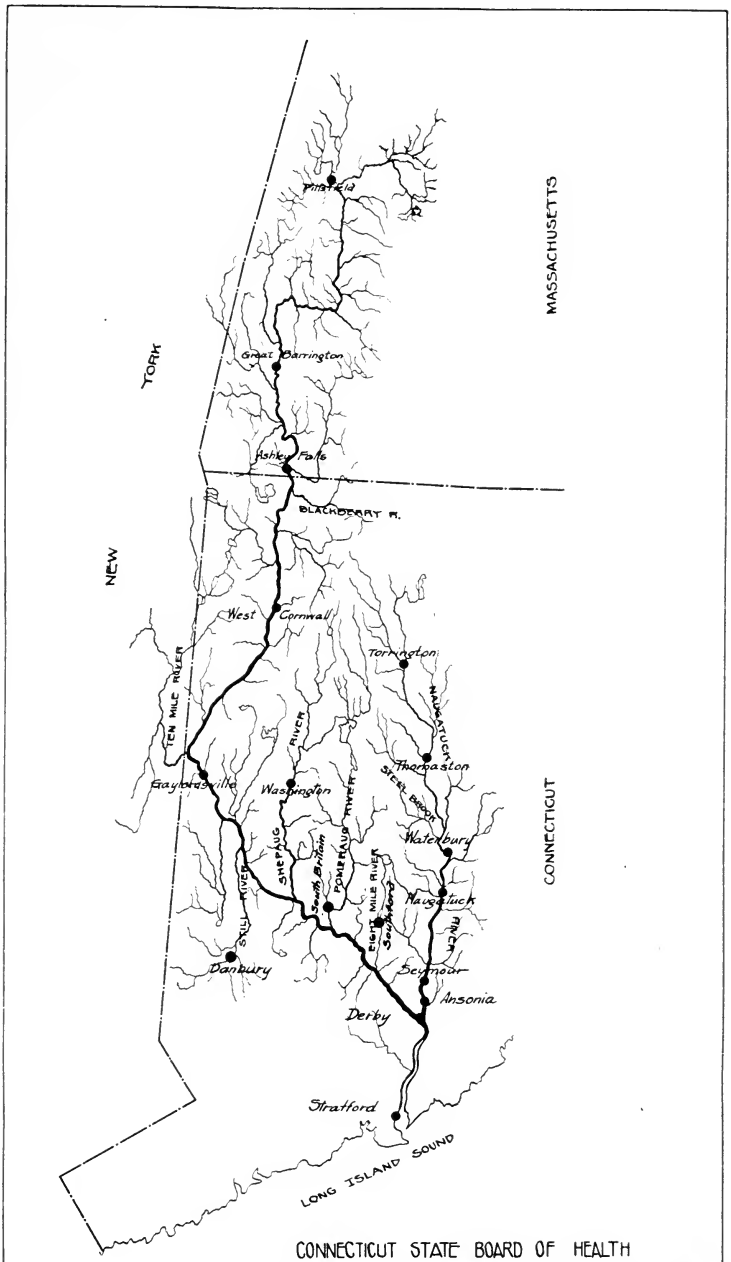
SAMPLING STATIONS AND DISSOLVED OXYGEN.

MIDDLE RIVER.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Orcuttville	74	8/6	2:30	25	77	6	3.36	40
	A						3.63	43
SQUARE POND BROOK.								
At Stafford Springs Station	73	8/6	1:15	25	77	3	2.72	32
	A						2.9	34
Below West Stafford	75	8/6	2:45	25	77	2	4.9	58
	A						4.59	54
FURNACE BROOK.								
Below Stafford	76	8/6	3:00	25	77	9	3.35	40
	A						2.09	24
At Staffordville	77	8/6	3:30	25	77	4	5.18	61
	A						7.36	87

FURNACE BROOK.

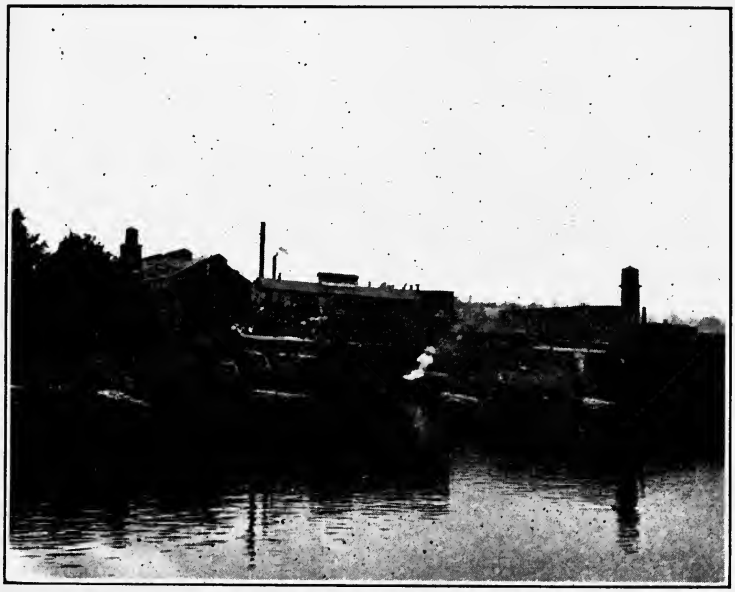
Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures Textile Works
Stafford	1,000	Factory	300	2
Staffordville	500	Factory	200	2
MIDDLE RIVER.				
Orcuttville	200	None	0	..
Elithorpe	200	None	0	..
SQUARE POND BROOK.				
West Stafford	500	None	0	..
Total	2,400		500	4



CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING THE DRAINAGE AREA
HOUSATONIC & NAUGATUCK RIVERS

THE HOUSATONIC RIVER.

The Housatonic River enters Long Island Sound at Stratford, and is tidal to Derby, a distance of about eight miles. It has a drainage area of about 1,930 square miles, 527 of which lie in Massachusetts. From the state line to the entrance of the Still River it flows through a valley of limestone formation and from thence to the Sound through a region of crystalline rock. It has a fall of about nine feet to the mile from the State Line to Falls Village, from Falls Village to Cornwall Bridge about 19 feet, from



HOUSATONIC RIVER, DERBY.

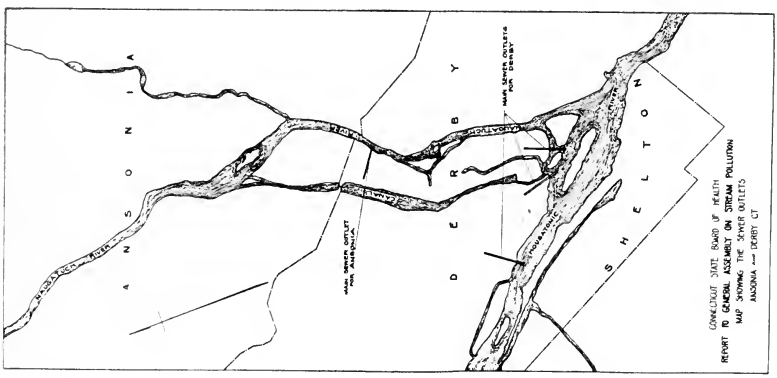
Cornwall Bridge to entrance of the Shepaug River 10 feet, and from thence to the Sound 3.5 feet. Its main tributaries in Connecticut are the Naugatuck, Blackberry, Still, Shepaug, Pomeraug, Eight Mile and the Ten Mile Rivers, most of the latter lying in New York State. The numerous waterfalls and rapids on the river afford excellent means of aeration, and assist materially in preventing objectionable conditions.

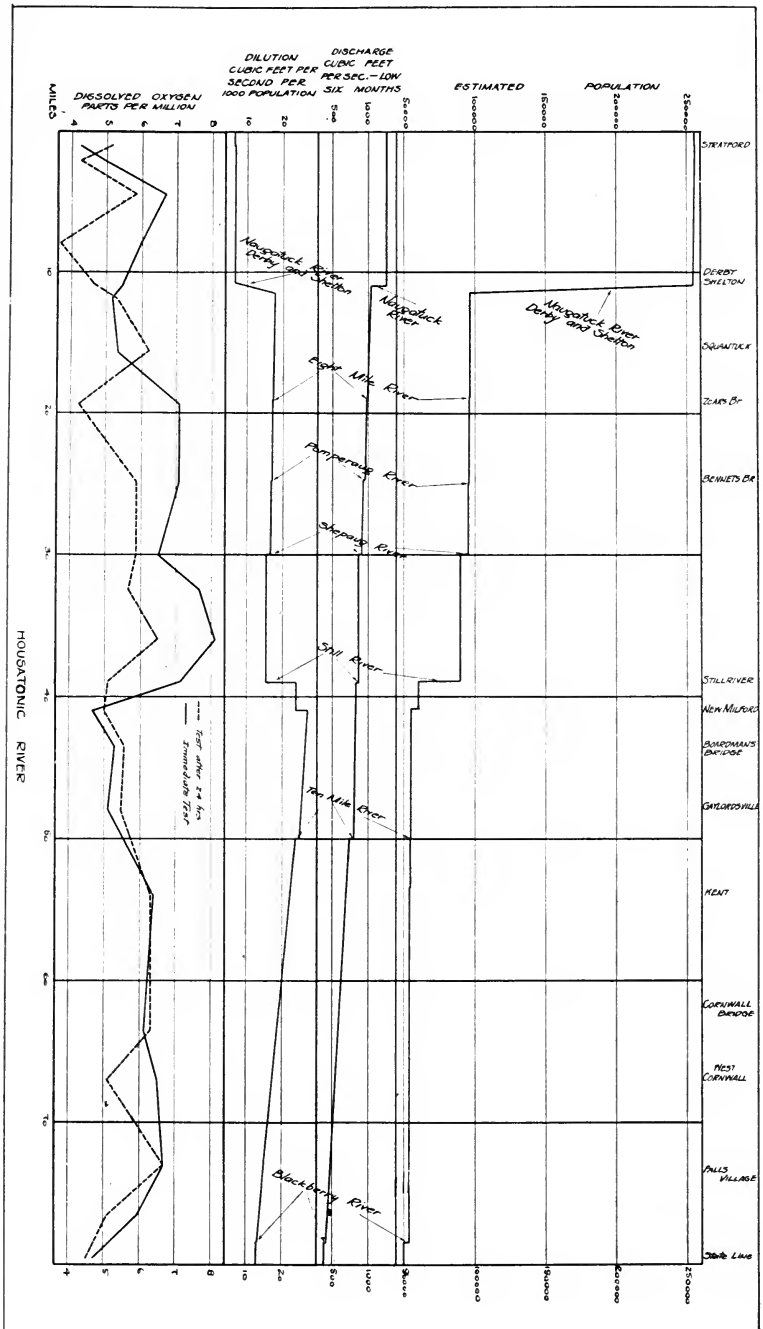
The river shows some signs of pollution from its mouth to Derby, between Derby and West Cornwall it appears to be in very fair condition but from West Cornwall to the State Line its condition gradually grows worse. The evidences of pollution at the State Line are probably due to the manufacturing wastes and sewage discharged into it by Great Barrington, Stockbridge, Lee, Lenox, Pittsfield and Dalton in Massachusetts.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	219	9/10	3:25	23	73	2	4.24	48
	A						5.18	59
At Washington Bridge	218	9/10	3:10	23	73	0	4.99	57
	A						4.24	48
Below Fowler's Island	217	9/10	2:45	23	73	0	6.69	77
	A						5.84	67
Opposite Long Hill	216	9/10	2:20	23	73	4	5.94	68
	A						3.67	42
Below Junction of Naugatuck River	215	9/10	2:00	23	73	5	5.46	62
	A						4.62	53
Above Derby	181	9/1	8:00	26	79	0	5.18	63
	A						5.28	64
At Squantuck	182	9/1	8:10	26	79	0	5.37	65
	A						6.22	75
At Zoar's Bridge	183	9/1	8:30	26	79	1	7.07	86
	A						4.24	51
At Bennett's Bridge	184	9/1	8:55	26	79	0	7.07	86
	A						5.84	71
Below Entrance of Shepaug River	185	9/1	9:40	26	79	6	6.50	79
	A						5.84	71
Above Shepaug River	199	9/2	5:30	26	78	3	7.63	92
	A						5.65	68
At Rocky Hill Bridge	198	9/2	5:00	26	79	4	8.10	98
	A						6.50	79
Above Entrance of Still River	197	9/2	4:30	26	79	18	7.16	87
	A						5.09	61
Below New Milford	208	9/8	9:15	24	75	4	4.71	55
	A						4.99	58
At Boardman's Bridge	209	9/8	9:40	24	75	5	5.28	61
	A						5.56	65
At Gaylordsville	210	9/8	10:10	24	75	4	5.09	59
	A						5.46	64
At Kent	212	9/8	12:45	24	75	5	6.4	75
	A						6.31	73
At Cornwall Bridge	213	9/8	1:40	24	75	5	6.12	71
	A						6.31	73
At West Cornwall	214	9/10	2:00	24	75	4	6.5	76
	A						5.09	59
At Falls Village	223	9/14	10:15	18	64	21	6.6	69
	A						6.5	68
Below Entrance of Blackberry River	224	9/14	10:50	17	63	3	5.94	60
	A						5.09	52
At State Line	225	9/14	11:40	17	63	4	4.71	48
	A						4.52	46

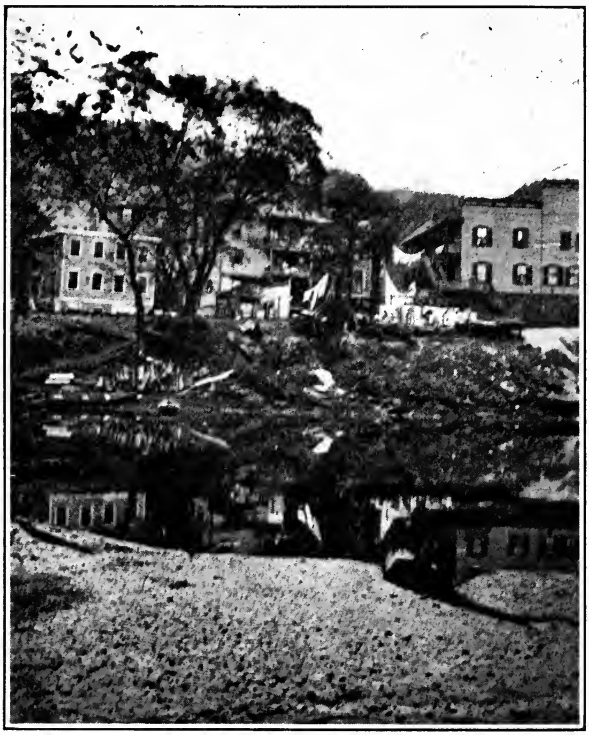
Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures. Silk Mills	Textile Works	Galvanizing Works	Creameries	Gas Works	Laundries	Paper Mills	Metal Works	Breweries	Rubber Works
Stratford	2,500	Partial	100	..	..	..	..	..	..	..	..	..	..
Derby	6,000	Partial	5,500	..	1	..	..	1	2	..	9	1	..
Shelton	5,000	Partial	4,500	2	3	2	..	..	..	..	8	..	..
Squantuck	100	None	0	..	..	..	..	..	..	..	..	..	..
Riverside	100	None	0	..	..	..	..	..	..	..	..	..	..
Stevenson	100	None	0	..	..	..	..	..	..	..	..	..	..
Berkshire	100	None	0	..	..	..	..	..	..	..	..	..	..
Rocky Glen	100	None	0	..	..	..	..	..	..	..	..	..	..
Sandy Hook	400	Factory	200	..	1	..	..	..	..	1	1	..	1
Newtown	300	None	50	..	..	..	1	..	..	..	..	..	..
Hawleyville	200	None	0	..	..	..	..	..	..	..	..	..	..
Still River	200	None	0	..	..	..	..	..	..	..	..	..	..
New Milford	4,500	Partial	4,000	..	1	..	..	..	..	..	2	..	..
Boardman's Bridge	100	None	0	..	..	..	..	..	..	..	..	..	..
Merwinsville	100	None	0	..	..	..	..	..	..	..	..	..	..
Gaylordsville	200	None	0	..	..	..	..	..	..	..	..	..	..
South Kent	200	None	0	..	..	..	..	..	..	..	..	..	..
Kent	500	None	0	..	..	..	..	..	..	..	..	..	..
Flanders	100	None	0	..	..	..	..	..	..	..	..	..	..
Macedonia	100	None	0	..	..	..	..	..	..	..	..	..	..
North Kent	100	None	0	..	..	..	..	..	..	..	..	..	..
Cornwall	200	None	0	..	..	..	..	..	..	..	..	..	..
Cornwall Bridge	200	None	0	..	..	..	..	..	..	..	..	..	..
West Cornwall	200	Factory	50	..	..	..	1	..	..	..	1	..	..
Lime Rock	200	Factory	100	..	..	..	..	..	..	..	..	..	..
Falls Village	200	Private	50	..	..	..	..	..	..	..	..	..	..
South Canaan	100	None	0	..	..	..	..	..	..	..	..	..	..
Total	22,100		14,550	2	6	2	2	1	2	1	21	1	1




DISSOLVED OXYGEN PARTS PER MILLION
DILUTION CUBIC FEET PER SECOND PER 1000 POPULATION
DISCHARGE CUBIC FEET PER SEC. — LOW SIX MONTHS
ESTIMATED POPULATION
MILES
HOUSATONIC RIVER
STRATFORD
DERBY SHELTON
DERBY
SHELTON
ANSONIA
ZOAR'S BR
BENNETS BR
STILLRIVER
NEW MILFORD
BOARDMAN'S BRIDGE
GAYLORDSVILLE
KENT
CORNWALL BRIDGE
WEST CORNWALL
FALLS VILLAGE
State Line
Naugatuck River Derby and Shelton
Naugatuck River
Naugatuck River Derby and Shelton
Eight Mile River
Pomperaug River
Shepaug River
Still River
Ten Mile River
Blackberry River
Test after 24 hrs
Immediate Test

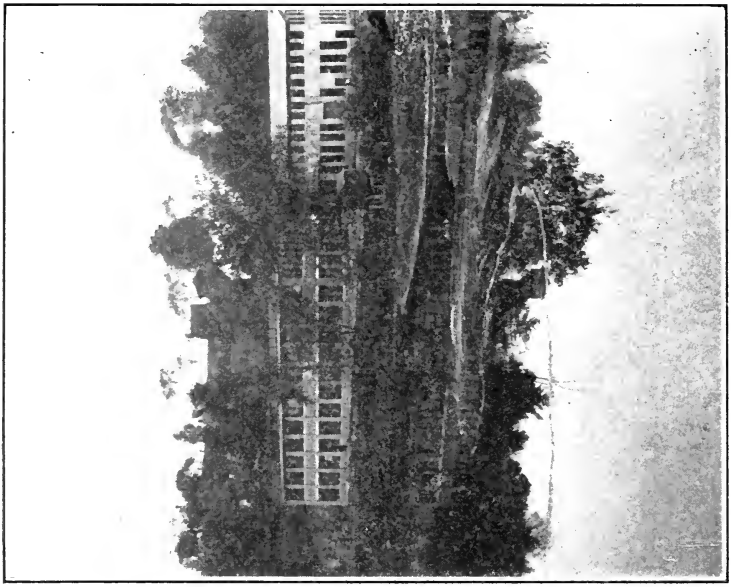
THE NAUGATUCK RIVER.

The Naugatuck River enters the Housatonic below Derby. It has a drainage area of about 331 square miles and is a very rapid stream flowing through a narrow valley with high hills on both sides. On it are many dams and mill ponds and its flow is quite variable, in fact, during the dry season there is very little water flowing in some portions of the river. The river is badly polluted. Ansonia, Naugatuck and Waterbury empty their sew-

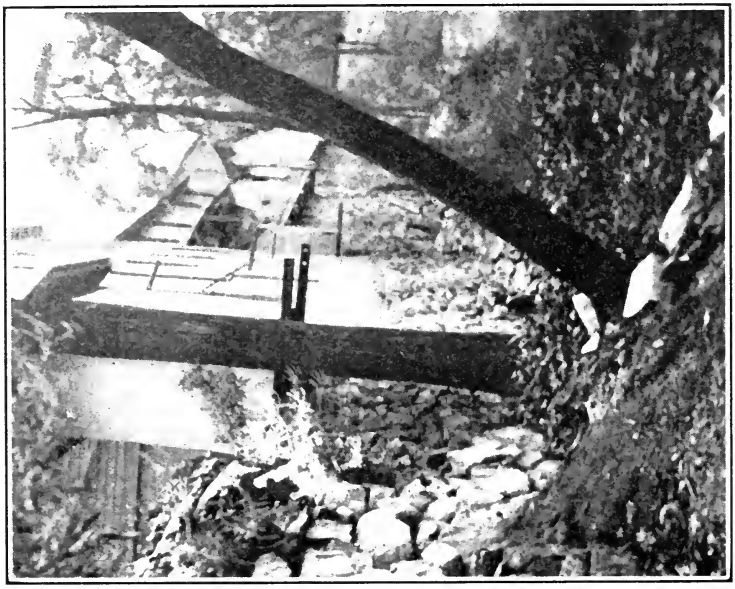


NAUGATUCK RIVER, DERBY.

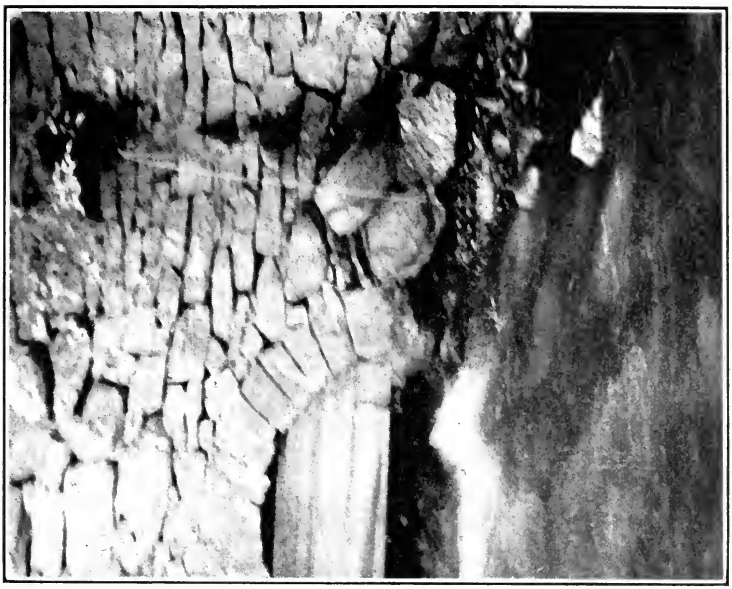
age untreated into it and the manufacturing wastes from the mills and factories tend to increase further a condition already deplorable. Foul odors are very noticeable and decomposing sludge and other deposits are visible at low water all along the banks of the river. In a number of places outhouses are located directly on the river. Above Waterbury the condition of the river is improved but from Thomaston to Torrington there are evidences of pollution.



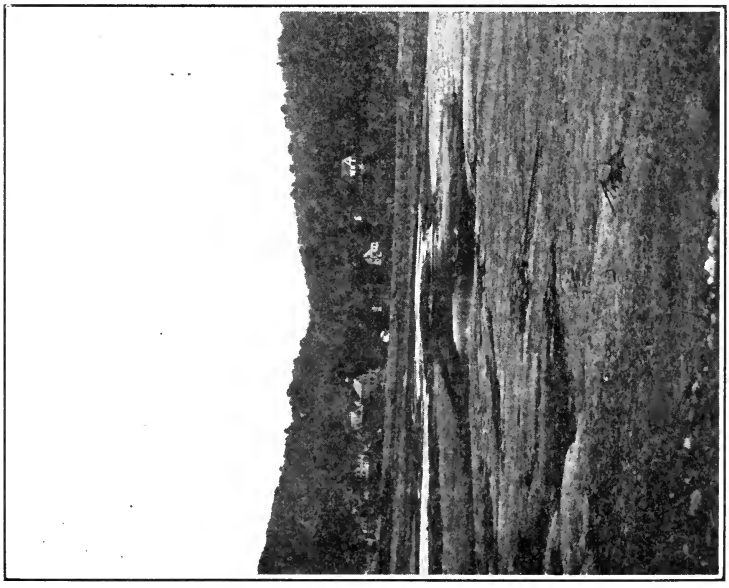
NAUGATUCK RIVER, SEYMOUR.



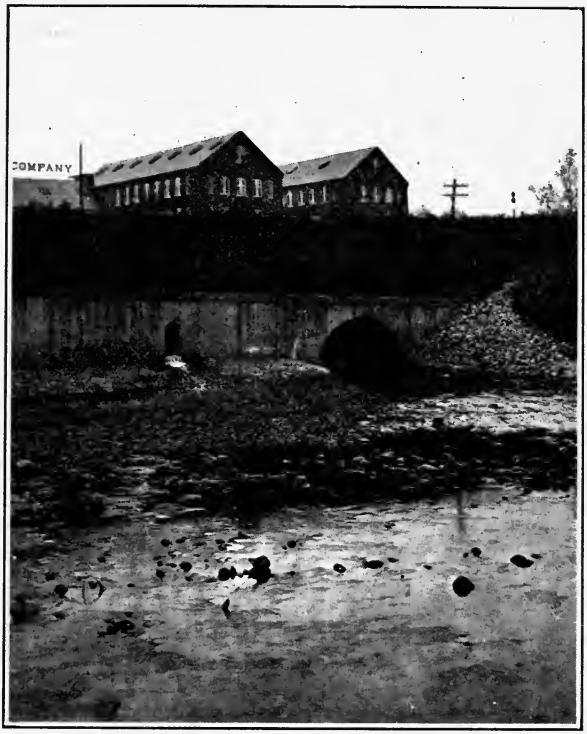
NAUGATUCK RIVER, SEYMOUR.



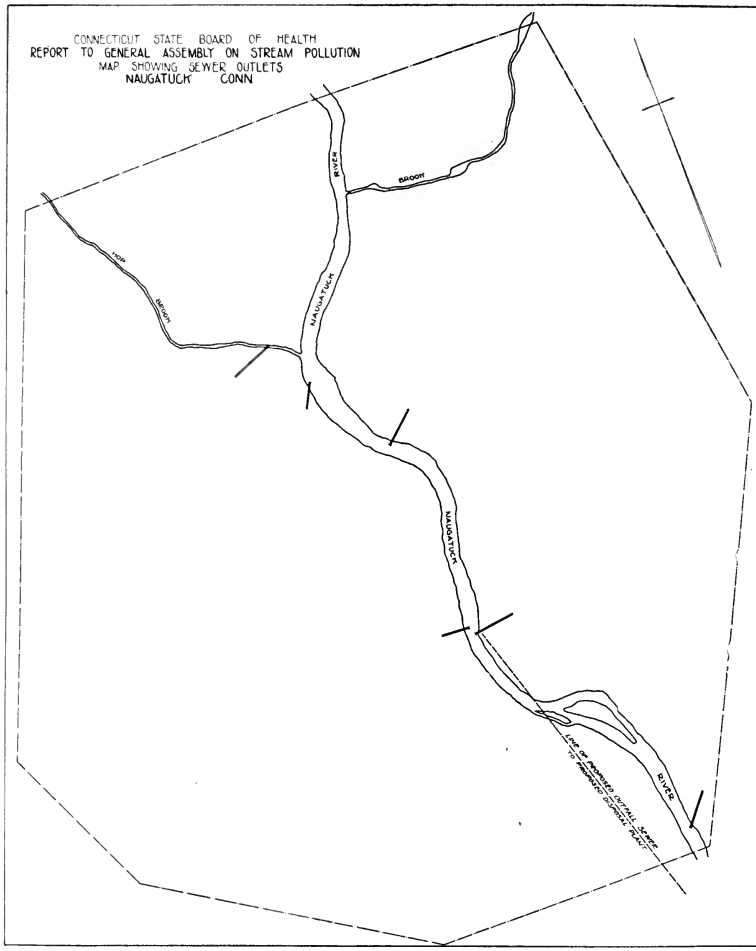
NAUGATUCK RIVER, SEYMOUR.

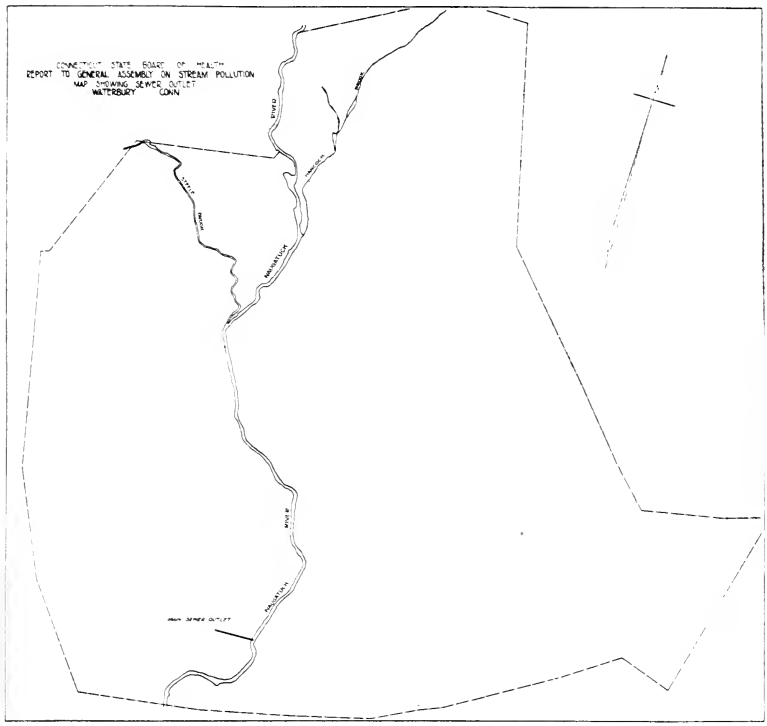


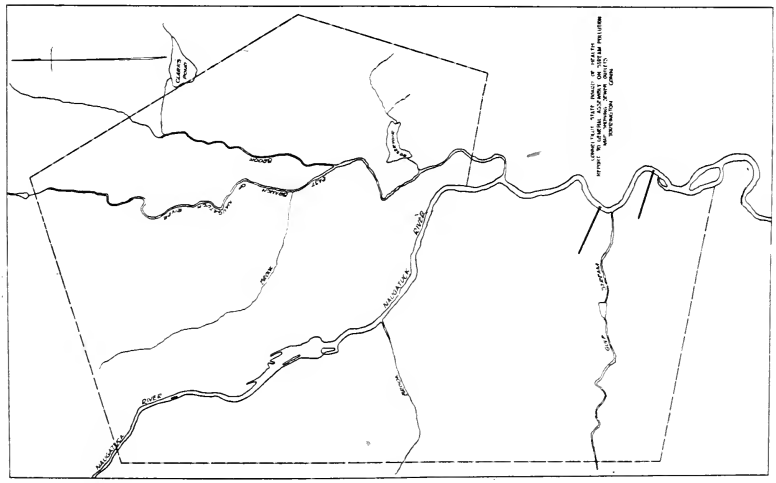
NAUGATUCK RIVER, BEACON FALLS.



NAUGATUCK RIVER, NAUGATUCK.


CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING SEWER OUTLETS
NAUGATUCK CONN.
BROOK
NAUGATUCK RIVER
NAUGATUCK
NAUGATUCK
RIVER

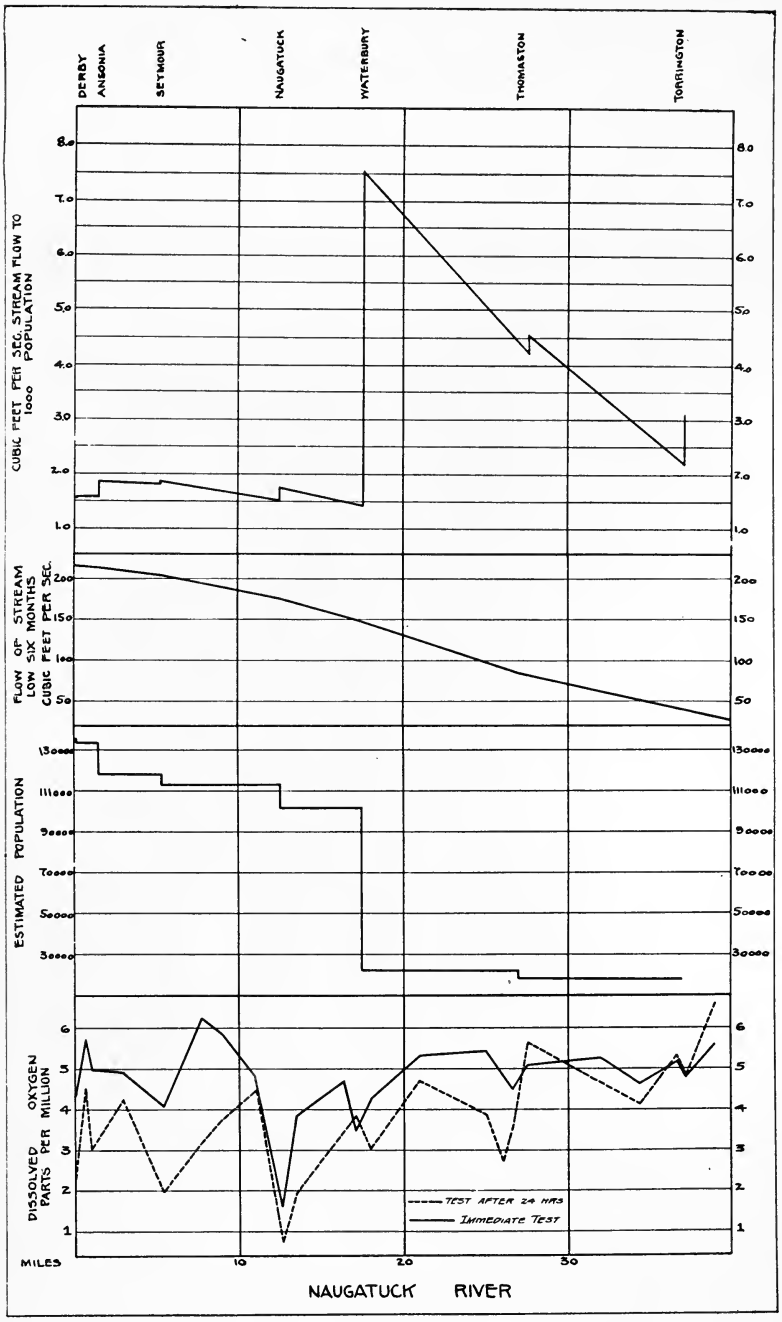

CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING SEWER OUTLET
WATERBURY CONN
MAIN SEWER OUTLET



SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	158	8/26	8:40	22	72	21	4.33	49
	A						2.26	25
At Derby	159	8/26	8:55	22	72	23	5.74	65
	A						4.52	51
At Ansonia	160	8/26	9:05	22	72	24	4.99	56
	A						3.01	34
Below Seymour	161	8/26	9:30	22	72	55	4.90	55
	A						4.24	48
At Seymour	162	8/26	9:55	22	72	19	4.05	45
	A						1.98	22
At Pine Bridge	163	8/26	10:30	22	72	6	6.22	70
	A						3.30	37
At Beacon Falls	164	8/26	10:50	22	72	2	5.84	66
	A						3.77	42
Below Naugatuck	165	8/26	11:10	22	72	9	4.80	54
	A						4.43	50
At Naugatuck	166	8/26	11:40	22	72	1	1.60	18
	A						.75	8
Above Union City	167	8/26	12:00	22	72	8	3.86	43
	A						1.97	22
At Hopeville	168	8/26	12:30	22	72	2	4.71	53
	A						3.48	39
Lower End Waterbury	169	8/26	12:45	22	72	3	3.48	39
	A						3.86	43
Upper End Waterbury	170	8/28	9:00	21	70	6	4.24	47
	A						3.01	33
Above Waterville	171	8/28	9:30	22	72	6	5.37	60
	A						4.71	53
At Reynolds Bridge	172	8/28	10:15	21	70	6	5.46	60
	A						3.86	42
Below Thomaston	173	8/28	10:25	21	70	3	4.90	54
	A						2.73	30
At Thomaston	174	8/28	10:35	21	70	5	4.52	50
	A						3.58	39
Above Thomaston	175	8/28	10:50	21	70	8	5.09	56
	A						5.65	62
At Campville	176	8/28	11:15	21	70	9	5.28	58
	A					Broken	Bottle	
At East Litchfield	177	8/28	11:30	21	70	1	4.62	51
	A						4.14	46
Below Torrington	178	8/28	11:40	21	70	4	5.18	57
	A						5.37	59
At Torrington	179	8/28	11:55	21	70	1	4.80	53
	A						4.80	53
At West Torrington	180	8/28	12:10	20	68	3	5.61	61
	A						6.60	71

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures. Silk Mills	Textile Works	Galvanizing Works	Dye Works	Laundries	Fertilizers	Paper Mills	Metal Works	Grist Mills	Breweries	Rubber
Derby	3,000	Partial	2,500	..	..	..	..	..	..	..	3	..	1	..
Ansonia	16,140	Partial	15,000	..	1	..	..	1	..	1	14	1	..	..
Seymour	5,284	Factory	2,500	..	1	..	..	..	..	1	12	..	..	..
Oxford	100	None	0	..	..	..	..	..	..	..	..	..	..	..
Beacon Falls	300	Factory	200	..	..	..	..	..	..	..	1	..	..	..
Straitsville	100	None	0	..	..	..	..	..	..	..	..	..	..	..
Naugatuck	12,400	Partial	12,000	..	1	..	..	..	..	1	..	..	..	3
Union City	1,000	Partial	400	..	..	1	..	..	..	..	3	..	..	..
Middlebury	100	None	0	..	..	..	..	..	..	..	..	..	..	..
Hopeville	100	None	0	..	..	..	..	..	..	..	..	..	..	..
Waterbury	81,800	Complete	80,000	1	..	1	1	5	1	2	49	..	2	..
Waterville	800	Factory	400	..	1	..	..	..	..	..	4	..	..	..
Greystone	300	Factory	100	..	..	..	..	..	..	..	1	..	..	..
Hancock	100	None	0	..	..	..	..	..	..	..	..	..	..	..
Reynolds Bridge	100	None	0	..	..	..	..	..	..	..	..	..	..	..
Thomaston	3,626	Factory	600	..	..	..	..	..	..	..	3	..	..	..
Plymouth	800	None	0	..	..	..	..	..	..	..	..	..	..	..
Northfield	400	Factory	100	..	..	..	..	..	..	..	1	..	..	..
Fluteville	100	None	0	..	..	..	..	..	..	..	..	..	..	..
East Litchfield	100	None	0	..	..	..	..	..	..	..	..	..	..	..
Harwinton	100	None	0	..	..	..	..	..	..	..	..	..	..	..
Torrington	18,200	Partial,	18,000	..	1	..	..	1	..	..	9	..	..	..
West Torrington	200	None	0	..	..	..	..	..	..	..	..	..	..	..
Daytonville	100	None	0	..	..	..	..	..	..	..	..	..	..	..
Winchester Center	100	None	0	..	..	..	..	..	..	..	..	..	..	..
Total	145,350		131,800	1	5	2	1	7	1	5	100	1	3	3


DERBY
ANSONIA
SEYMOUR
NAUGATUCK
WATERBURY
THOMASTON
TORRINGTON
CUBIC FEET PER SEC. STREAM FLOW TO 1000 POPULATION
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
FLOW OF STREAM LOW SIX MONTHS CUBIC FEET PER SEC.
200
150
100
50
ESTIMATED POPULATION
130000
110000
90000
70000
50000
30000
DISSOLVED OXYGEN PARTS PER MILLION
6
5
4
3
2
1
TEST AFTER 24 HRS
IMMEDIATE TEST
MILES
10
20
30
NAUGATUCK RIVER

STEEL BROOK.

Steel Brook enters the Naugatuck from the west at Waterbury. It has a drainage area of about 18 square miles and is a rapid stream flowing through a quite hilly country. The river receives some pollution for its entire length and its condition is particularly bad below Watertown where the water is somewhat discolored by wastes and sewage from that city.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	338	12/3	9:00	1	34	12	5.98	42
	A						6.36	44
Below Oakville	339	12/3	9:40	1	34	1	5.89	41
	A						5.60	39
Below Rockdale	340	12/3	10:10	1	34	1	6.74	47
	A						6.07	42
Below Watertown	341	12/3	10:30	1	34	0	3.99	28
	A						5.03	35
Opposite Watertown	342	12/3	11:00	1	34	5	5.98	42
	A						7.98	60
Above Watertown	343	12/3	11:30	1	34	8	6.53	45
	A						6.84	48

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures: Silk Mills	Statistics of Manufactures: Metal Works
Oakville	500	Factory	300	..	2
Rockdale	100	None	0	..	..
Watertown	4,150	Partial	3,000	2	..
Total	4,750		3,300	2	2

THE EIGHT MILE RIVER.

The Eight Mile River enters the Housatonic from the east at Riverside. It has a drainage area of about 15 square miles. It is a rather shallow stream flowing through a rolling wooded country, sparsely settled. The river is polluted below Southford, the water being quite badly discolored. The other portions of the river appear to be in very fair condition.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	329	11/25	8:30	1	33	5	6.17	43
	A						7.60	53
Below Southford	336	11/25	3:45	2	36	1	5.98	43
	A						5.98	43
Above Southford	337	11/25	4:00	1	33	0	7.03	49
	A						6.46	45

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures Paper Mills
Southford	200	Factory	50	1

THE POMPERAUG RIVER.

The Pomperaug River enters the Housatonic at Bennett's Bridge. It has a drainage area of about 92 square miles and is a swift stream, flowing through a very hilly country. The river receives some pollution at South Britain but in general its condition is very good.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	330	11/25	9:25	1	33	1	8.83	62
	A						9.85	69
Below South Britain	331	11/25	10:15	1	33	6	8.45	59
	A						9.21	64
Below Pomeraug	332	11/25	11:00	1	33	5	8.17	57
	A						9.59	67
At Woodbury	333	11/25	11:40	1	33	3	8.36	58
	A						6.46	45
Below Hotchkissville	334	11/25	12:20	1	33	2	12.44	87
	A						8.36	58
Below Minortown on Nonewaug river	335	11/25	1:30	1	33	1	8.83	62
	A						7.22	50

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufacture Metal Works
South Britain	200	Factory	50	1
Southbury	200	None	0	..
Woodbury	300	None	0	..
Hotchkissville	300	Factory	50	1
Minortown	100	None	0	..
Bethlehem	100	None	0	..
Total	1,200		100	2

THE SHEPAUG RIVER.

The Shepaug River flows into the Housatonic about 17 miles above Derby. It has a drainage area of about 154 square miles and a fall of about 30 feet to the mile. It flows through a rough and hilly region of crystalline rock formation. The general condition of this river is quite good, though there appears to be some pollution where it enters the Housatonic.

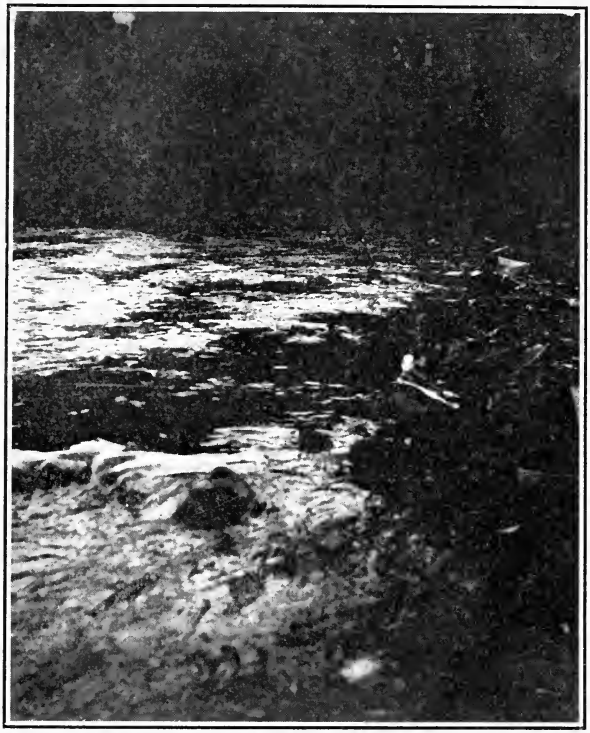
SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	186	9/1	9:55	24	75	8	3.58	41
	A						4.99	58
At Roxbury Falls	187	9/1	10:15	24	75	1	4.14	48
	A						4.80	86
At Roxbury Station	188	9/1	10:50	23	73	1	4.43	51
	A						4.62	53
Below Washington	189	9/1	11:15	23	73	12	4.62	53
	A						4.90	56
Above New Preston	190	9/1	11:40	23	73	21	5.09	58
	A						4.14	47

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures. Metal Works	Quarries
Roxbury Falls	100	None	0	..	1
Roxbury Station	100	None	0	..	..
Roxbury	500	Partial	100	..	..
Judd's Bridge	100	None	0	..	..
Washington	500	Partial	100	..	..
Washington Station	100	None	0	..	..
New Preston	100	None	0	..	..
Romford	100	None	0	..	..
Morris Station	100	None	0	..	..
Woodville	100	None	0	..	..
Warren	100	None	0	..	..
Milton	100	None	0	..	..
East Cornwall	100	None	0	..	..
West Goshen	300	None	0	..	..
Bantam	500	Partial	300	2	..
Bantam Falls	100	None	0	..	..
Litchfield	1,500	Disposal plant	1,000	..	..
Goshen	300	None	0	..	..
Total	4,800		1,500	2	1

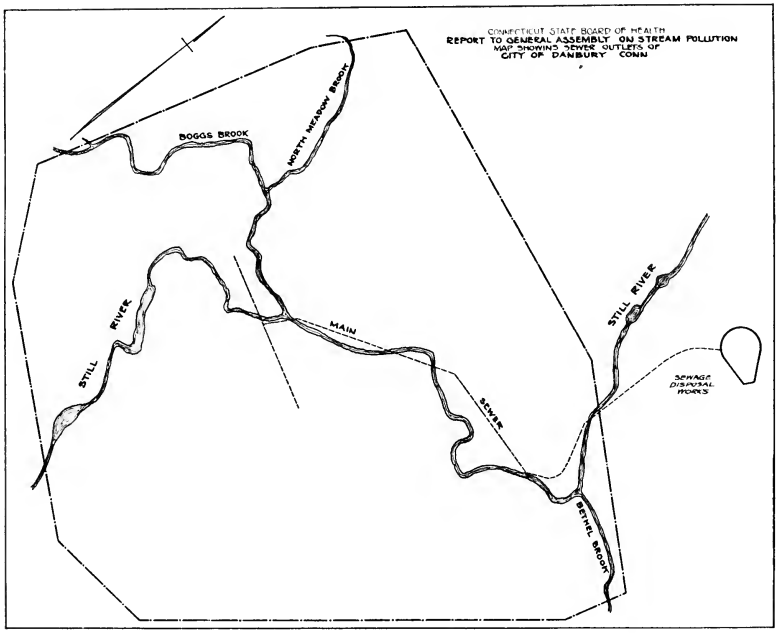
THE STILL RIVER.

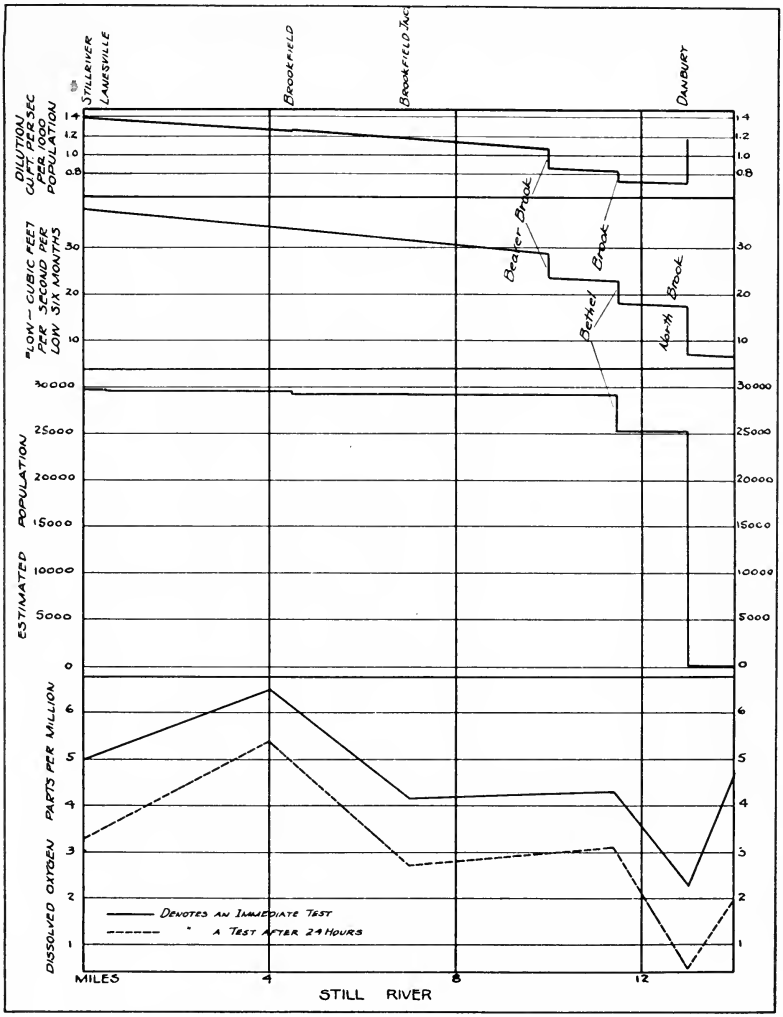
The Still River enters the Housatonic from the west at Stillriver, about two miles below New Milford. It has a drainage area of about 63 square miles. It is a fairly rapid stream flowing



STILL RIVER AT DANBURY.

through a rolling country of low hills. On it are many small dams and mill ponds. The river is badly polluted for its entire length but conditions are particularly offensive just below Danbury. Danbury treats its sewage and most of the pollution is due to manufacturing wastes.


CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING SEWER OUTLETS OF
CITY OF DANBURY CONN
BOGGS BROOK
NORTH MEADOW BROOK
STILL RIVER
MAIN
SEWER
STILL RIVER
SEWAGE DISPOSAL WORKS
BETHEL BROOK


STILLRIVER
LANESVILLE
BROOKFIELD
BROOKFIELD JCT.
DANBURY
DILUTION CU.FT. PER SEC PER 1000 POPULATION
"LOW" - CUBIC FEET PER SECOND PER LOW SIX MONTHS
ESTIMATED POPULATION
DISSOLVED OXYGEN PARTS PER MILLION
Beaver Brook
Bethel Brook
Kenosia Brook
DENOTES AN IMMEDIATE TEST
" A TEST AFTER 24 HOURS
MILES
4
8
12
STILL RIVER

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	196	9/2	4:15	26	79	5	4.9	59
	A						3.3	40
Below Brookfield	195	9/2	3:50	26	79	3	6.5	79
	A						5.37	65
At Brookfield Junction	194	9/2	3:25	26	79	22	4.14	50
	A						2.73	33
Below Danbury	193	9/2	3:05	26	79	10	4.33	52
	A						3.11	57
At Danbury, oppo. R. R. Station	192	9/2	2:45	26	79	12	2.26	27
	A						.47	5
Above Danbury	191	9/2	2:30	26	79	32	4.71	57
	A						1.98	24

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures. Silk Mills	Galvanizing Works	Textile Works	Distilleries	Gas Works	Laundries	Hat Factories	Paper Mills	Metal Works
Lanesville	100	None	0	..	..	..	..	..	..	..	..	..
Brookfield	300	Factory	100	..	..	..	..	..	..	..	..	1
Brookfield Junction	50	None	0	..	..	..	..	..	..	..	..	..
Bethel	3,978	Partial	2,000	1	..	..	..	..	..	14	2	..
Danbury	25,122	Disposal Plant	25,000	1	2	1	1	1	4	39	4	10
Mill Plain	100	None	0	..	..	..	..	..	..	..	..	..
Total	29,600		27,100	2	2	1	1	1	4	53	6	11

THE TEN MILE RIVER.

The Ten Mile River enters the Housatonic about two miles above Gaylordsville. It has a drainage area of about 75 square miles, most of which is in the state of New York. There are no towns in Connecticut on the river. At its entrance into the Housatonic is seems to be in very good condition.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	211	9/8	11:45	26	79	13	6.88	80
	A						6.44	75

THE BLACKBERRY RIVER.

The Blackberry River enters the Housatonic from the east about three miles below the State Line. It has a drainage area of about 48 square miles and flows through a rather narrow limestone valley. The river shows some signs of pollution at Canaan and East Canaan but its general condition is not bad.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	226	9/14	12:00	13	55	7	6.03	56
	A						5.75	54
At Canaan	227	9/14	12:45	13	55	3	6.22	58
	A						5.56	52
At East Canaan	228	9/14	1:30	13	55	5	7.44	70
	A						6.22	58

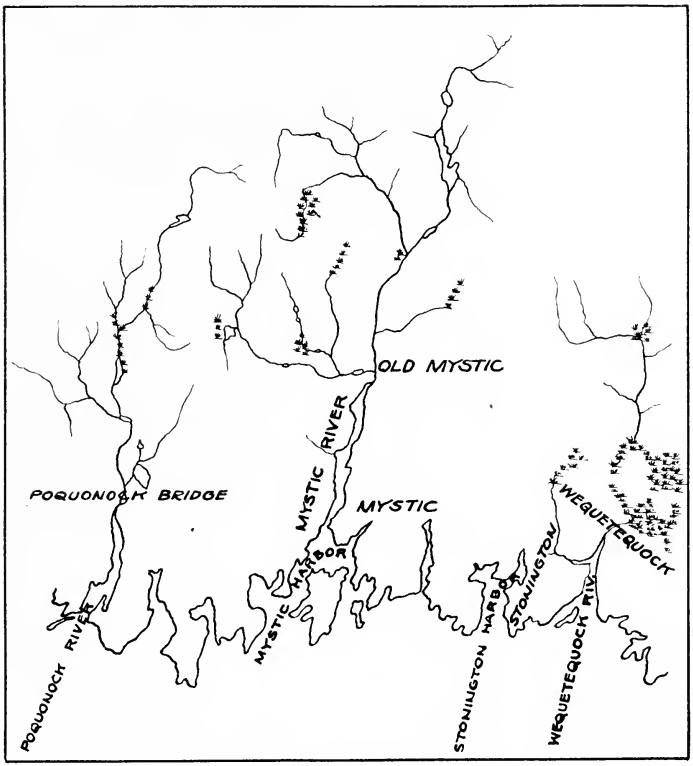
Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures. Silk Mills	Creameries	Tanneries	Metal Works	Quarries
Canaan	1,000	Disposal Plant	800	..	1	..	..	..
East Canaan	1,000	Factory	500	..	1	..	1	2
Canaan Valley	100	None	0	..	..	..	..	..
West Norfolk	100	None	0	..	..	..	..	..
Norfolk	1,600	Disposal Plant	1,500	1	..	1	..	..
Total	3,800		2,800	1	2	1	1	2

THE WEQUETEQUOCK RIVER.

The Wequetequock River enters Long Island Sound just east of Stonington. It is practically a tidal estuary with the town of Wequetequock at its head. It shows some signs of pollution though its condition on the whole is fairly good.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth at R. R. Bridge	124	8/17	2:15	25	73	7	3.63	43
	A						3.38	40
At Trolley Bridge	125	8/17	2.45	25	73	13	4.01	47
	A						3.38	40



THE MYSTIC RIVER.

The Mystic River flows into Mystic Harbor at Mystic. It has a drainage area of about 23 square miles and flows through a hilly, wooded region. On it are the towns of Mystic and Old Mystic. The river seems badly polluted for its entire length. Its condition is relieved somewhat by the tidal flow of water brought in from the Sound.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	120	8/17	10:55	25	73	1	2.58	30
	A						2.67	31
At Mystic	121	8/17	11:10	25	73	14	2.67	31
	A						2.19	26
Below Old Mystic	122	8/17	11:45	25	73	3	2.86	34
	A						1.91	22

THE POQUONOC RIVER.

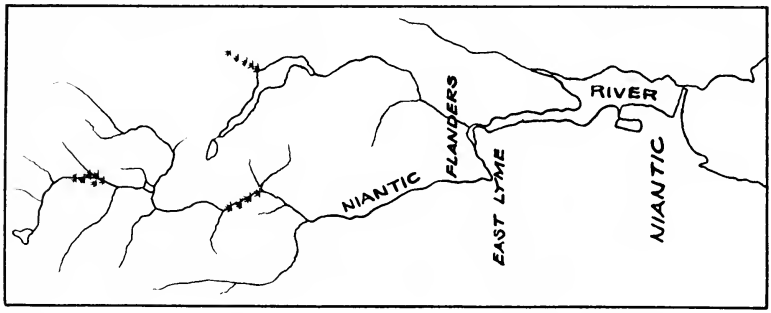
The Poquonoc River enters Long Island Sound just west of Stonington. It is practically a tidal estuary with the village of Poquonoc Bridge at its head. It shows signs of some pollution.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	126	8/18	11:20	24	75	1	3.53	41
	A						2.77	32
At Railroad Bridge	127	8/18	12:00	24	75	4	3.63	42
	A						3.34	39
At Poquonnoc Bridge	128	8/18	12:30	24	75	3	4.49	52
	A						3.53	41

THE NIANTIC RIVER.

The Niantic River flows into the Sound at Niantic. It has a drainage area of about 35 square miles and receives a large quantity of salt water at every tide. There are no towns of any size



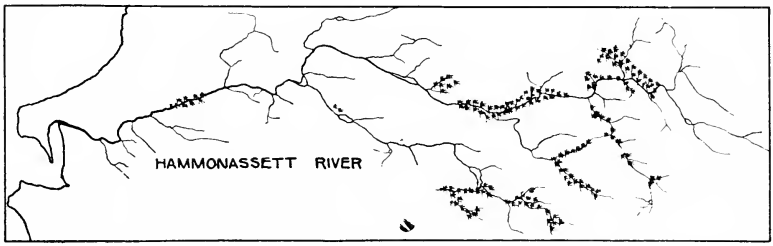
on this river, but the camp grounds of the National Guard and a camp of the Spiritualistic sect are on its banks. The river shows some signs of pollution but its general condition is not bad.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	129	8/18	2:30	24	75	2	4.13	48
	A						3.25	38
Opposite Division Point	130	8/18	3:00	24	75	0	4.01	47
	A						3.25	38
Head of Navigation	131	8/18	3:15	24	75	8	3.91	45
	A						2.86	33

THE HAMMONASSET RIVER.

The Hammonasset River flows into the Sound below Clinton. It has a drainage area of about 45 square miles and is a sluggish stream except in its upper reaches. There are no towns on this



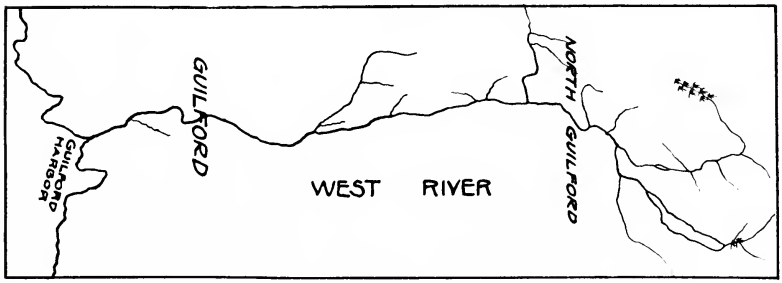
river and the houses on its drainage area are widely separated. The river shows signs of pollution at its mouth which is probably caused by fishery wastes.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	349 A	12/4	2:00	1.8	35	2	4.65 4.08	32 28
Five Miles above Mouth	350 A	12/4	3:00	7	33	1	5.41 5.89	38 41

THE WEST RIVER (Guilford).

The West River enters the Sound at Guilford. It has a drainage area of about 19 square miles and is a sluggish stream flowing



through marsh and meadow land. The river is discolored from its mouth to Guilford, above which place its condition improves.

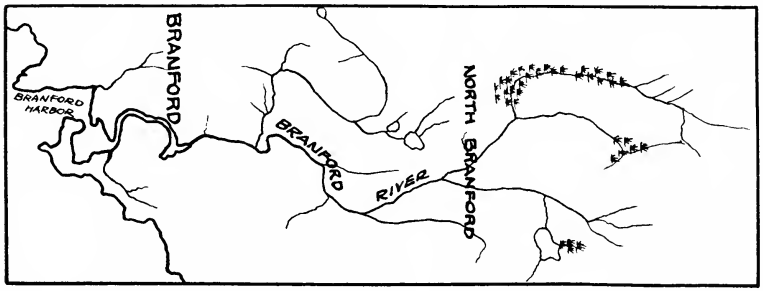
SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	348 A	12/4	12:20	2	35.6	2	5.32 5.98	38 43
Above Guilford	347 A	12/4	12:00	1.6	35	4	5.41 7.69	38 54

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures Metal Works
Guilford	2,000	Partial	1,000	1

THE BRANFORD RIVER.

The Branford River flows into Long Island Sound just below Branford. It has a drainage area of about 22 square miles and is a rather sluggish stream except in its upper reaches where it



flows through a very hilly country sparsely settled. The river shows signs of pollution from its mouth to Branford. Above Branford its condition is fair.

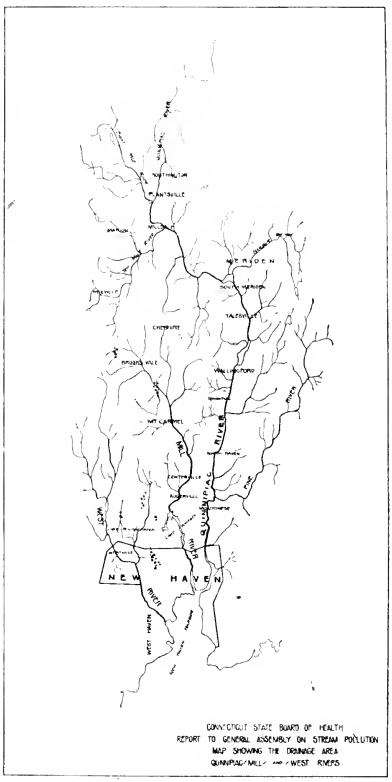
SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	344	12/4	9:40	3	37	1	4.46	33
	A						4.84	35
At Branford	345	12/4	10:20	2	36	6	5.13	37
	A						5.89	42
Below North Branford	346	12/4	11:00	8	46	3	6.36	44
	A						6.55	46

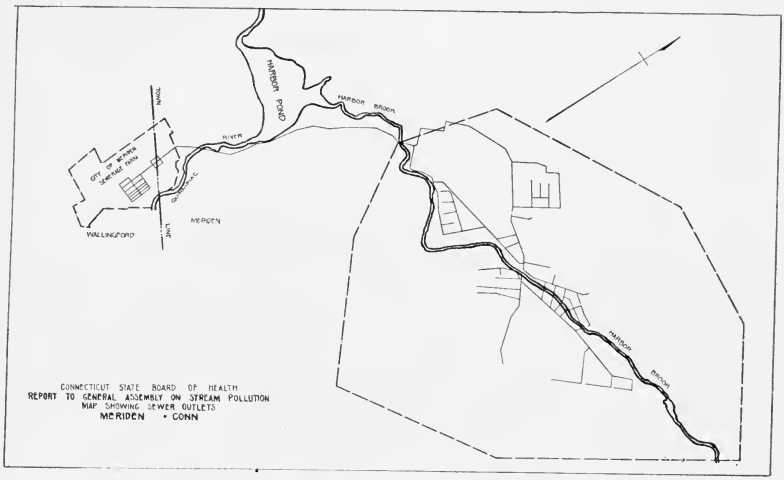
Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures. Metal Works	Grist Mills
Branford	3,000	Partial	1,500	2	1
North Branford	200	None	0	..	..
Total	3,200		1,500	2	1

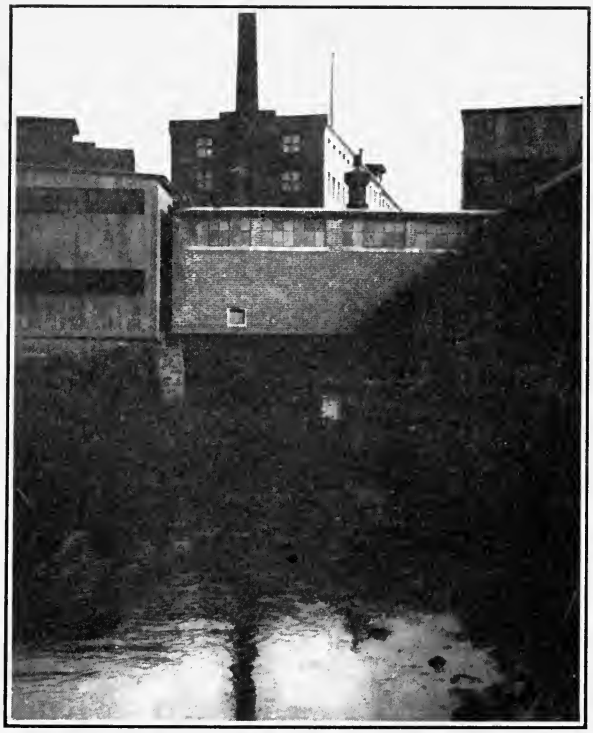
THE QUINNIPIAC RIVER.

The Quinnipiac River flows into New Haven Harbor. It has a drainage area of about 155 square miles and is tidal to Quinnipiac, a distance of about 10 miles. It is a sluggish stream flowing through a wide valley of sandstone and glacial formation. From Plainville to New Haven the river falls only five feet to the mile. The principal sources of pollution are the sewer outlets along its banks at New Haven, the sewage of Wallingford,

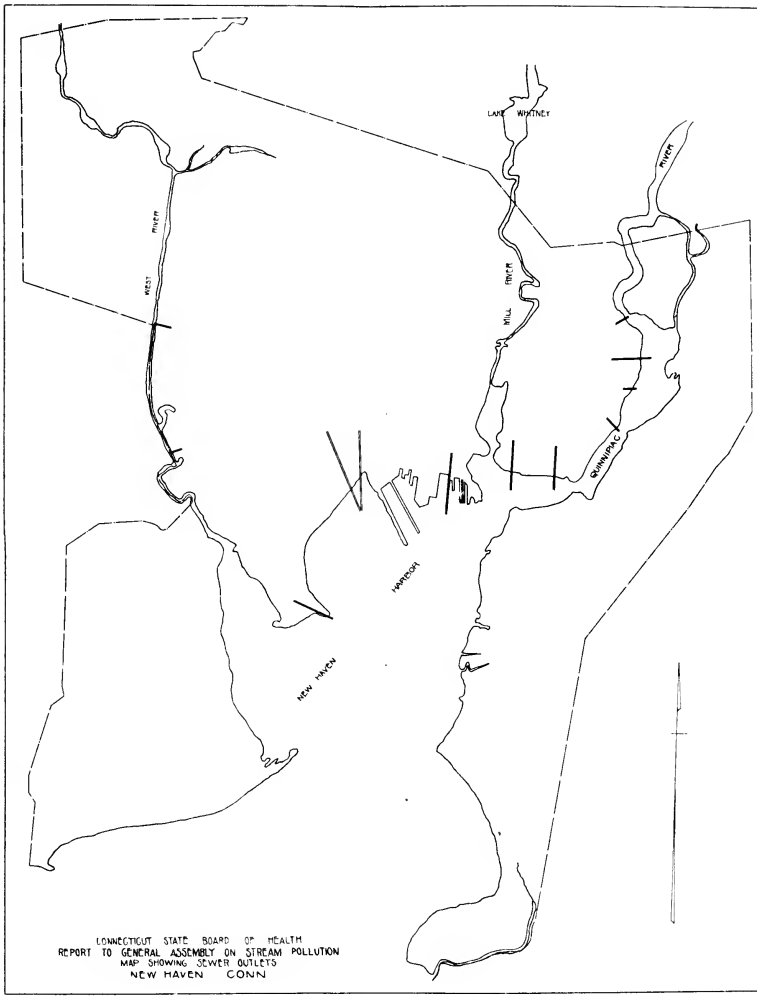


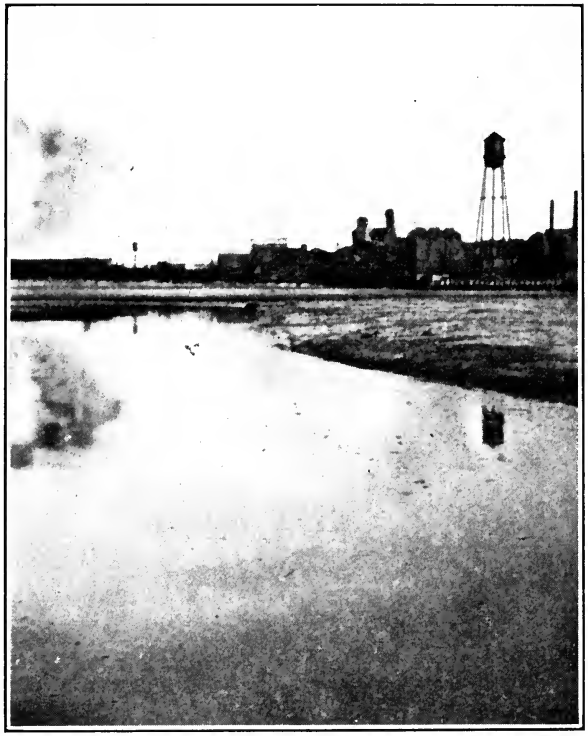
the wastes from the factories at South Meriden, Milldale, Plantsville and Southington and the factory wastes at Meriden through Harbor Brook. It also receives the effluent from the Meriden sewage beds and that from the Southington sewage treatment plant. Major fish life has practically disappeared in the vicinity of New Haven and several private oyster beds have had to be abandoned.



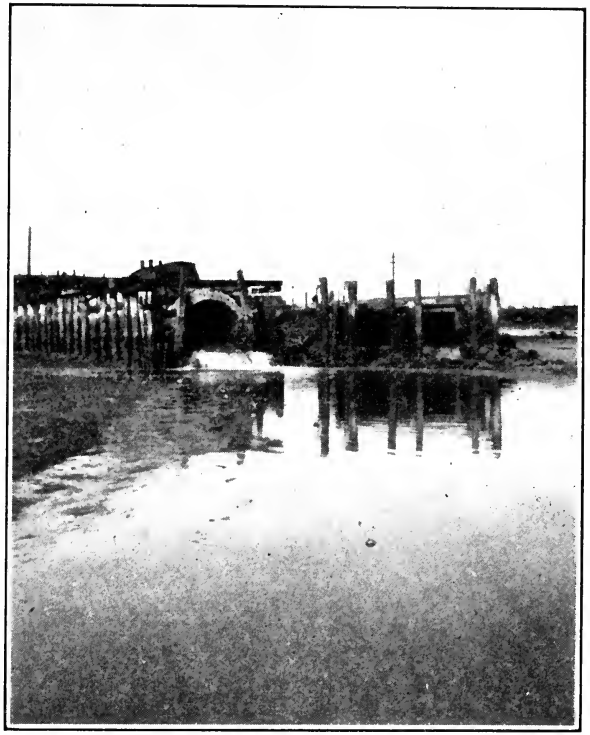


HARBOR BROOK AT MERIDEN.


LAKE WHITNEY
RIVER
WEST RIVER
MILL RIVER
QUINNIPIAC
HARTFORD
NEW HAVEN
CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
MAP SHOWING SEWER OUTLETS
NEW HAVEN CONN



JAMES STREET OUTLET, NEW HAVEN.

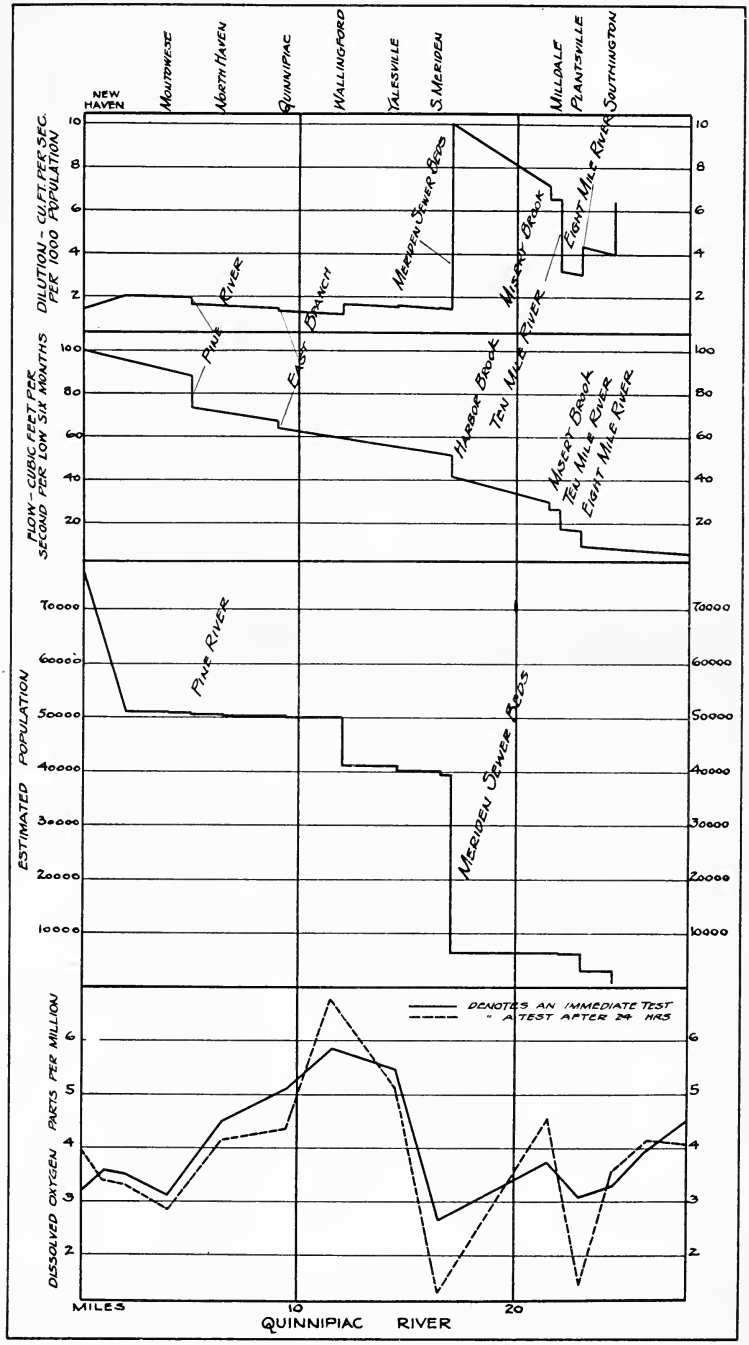


MEADOW AND STATE STREET OUTLETS, NEW HAVEN.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	202	9/3	10:55	24	75	0	3.19	37
	A						3.96	46
At New Haven, Grand Ave.	203	9/3	11:05	24	75	26	3.58	41
	A						3.39	39
At Shore Line R. R. Bridge, New Haven	204	9/3	11:15	24	75	20	3.48	40
	A						2.73	32
Opposite Montowese	205	9/3	11:30	24	75	0	3.11	36
	A						2.83	33
Opposite North Haven	206	9/3	12:05	24	75	17	4.52	52
	A						4.14	48
At Quinnipiac	207	9/3	1:10	24	75	0	5.09	59
	A						4.37	41
Below Wallingford	132	8/21	1:30	26	79	2	5.84	71
	A						6.78	82
At Yalesville	133	8/21	1:50	26	79	5	5.46	66
	A						5.09	61
At South Meriden	134	8/21	2:30	25	77	17	2.64	31
	A						1.31	15
Below Milldale	136	8/21	3:40	24	75	35	3.77	44
	A						4.52	52
At Plantsville	137	8/21	3:50	24	75	6	3.11	36
	A						1.41	16
At Southington	140	8/21	5:50	24	75	32	3.30	38
	A						3.58	41
Above Southington	139	8/21	5:20	24	75	34	3.96	46
	A						4.14	48
Below Plainville	138	8/21	4:50	23	73	97	4.52	52
	A						4.05	46
Harbor Brook Mouth	135	8/21	3:00	28	82	88	2.46	31
	A						2.54	32

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures.						
				Breweries	Galvanizing Works	Gas Works	Paper Mills	Metal Works	Silk Mills	Laundries
New Haven (part)	26,700	Complete	26,500	1	1	..	1	4	..	..
Montowese	100	None	0	..	..	..	..	..	..	..
North Haven	300	None	0	..	..	..	..	..	..	..
Quinnipiac	100	None	0	..	..	..	..	..	..	..
Wallingford	8,690	Partial	8,500	..	7	1	1	3	..	..
Yalesville	600	Factory	300	..	..	..	..	1	..	..
Meriden	33,414	Disposal plant	33,400	1	6	1	2	22	3	3
South Meriden	300	None	0	..	..	..	..	..	..	..
Milldale	300	Factory	150	..	..	..	..	2	..	..
Marion	100	None	0	..	..	..	..	..	..	..
Plantsville	3,000	Partial	2,000	..	..	..	..	5	..	..
Southington	3,000	Disposal plant	2,000	..	..	..	..	6	..	..
Total	76,604		72,850	2	14	2	4	43	3	3


NEW HAVEN
MOUNTPLEASE
NORTH HAVEN
QUINNIPIAC
WALLINGFORD
YALESVILLE
S. MERIDEN
MILLDALE
PLANTSVILLE
SOUTHINGTON
DILUTION - CU. FT. PER SEC. PER 1000 POPULATION
FLOW - CUBIC FEET PER SECOND PER LOW SIX MONTHS
PINE RIVER
EAST BRANCH
MERIDEN SEWER BEDS
MISERY BROOK
EIGHT MILE RIVER
HARBOR BROOK
TEN MILE RIVER
ESTIMATED POPULATION
DISSOLVED OXYGEN PARTS PER MILLION
DENOTES AN IMMEDIATE TEST
" A TEST AFTER 24 HRS
MILES
QUINNIPIAC RIVER

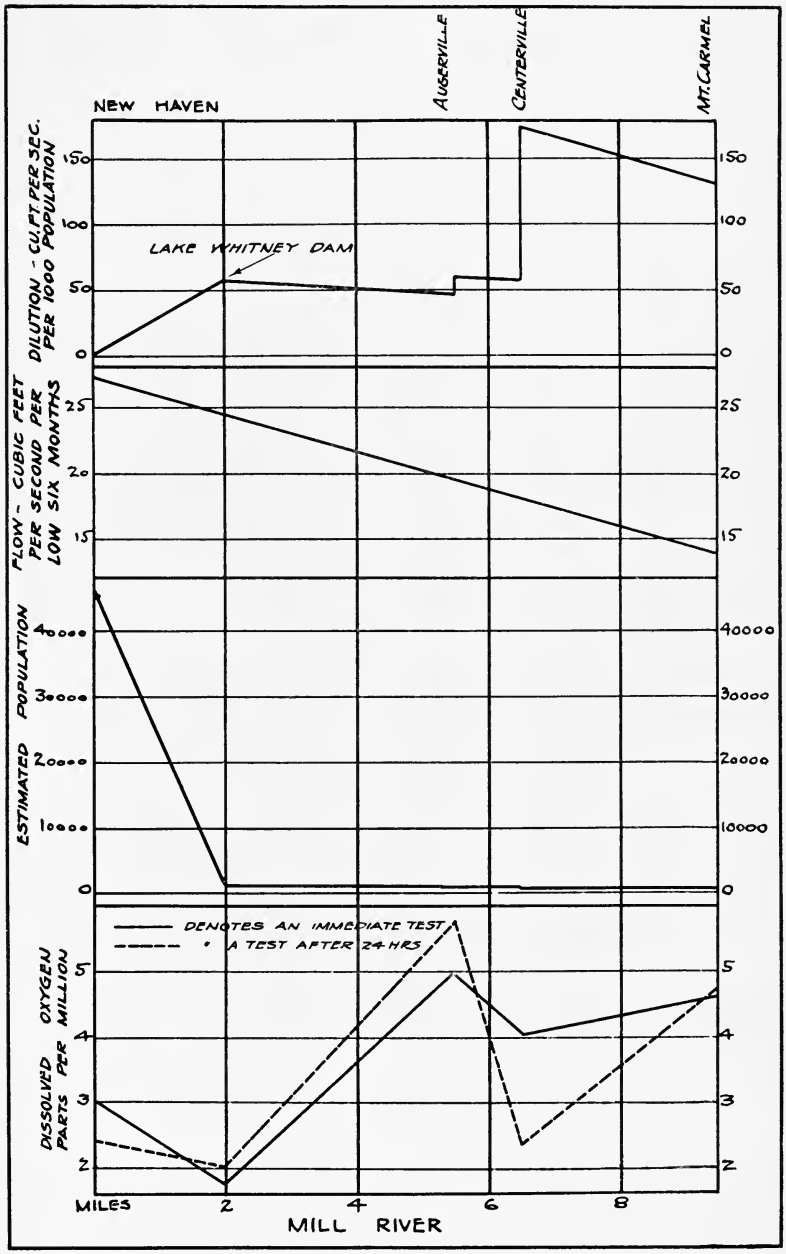
THE MILL RIVER.

The Mill River enters the Quinnipiac just above the head of New Haven Harbor. It has a drainage area of about 44 square miles, is a sluggish stream and in the lower part of the town of Hamden is dammed to impound water for one of the main supplies of New Haven, Lake Whitney. The river is badly polluted in its lower portion by storm overflows from the New Haven sewerage system and by several factories along its banks. Below Centerville the river shows considerable pollution probably from the textile factory located there. This factory is installing a plant for the treatment of its wastes which will no doubt improve the condition of the river at this point.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	201	9/3	10:40	24	75	5	3.01	35
	A						2.45	28
New Haven, State St. Bridge	150	8/25	11:40	24	75	23	1.79	20
	A						2.07	24
Augerville	151	8/25	12:20	24	75	0	4.99	58
	A						5.75	67
Below Centerville	152	8/25	12:40	24	75	0	4.05	47
	A						2.35	27
At Mt. Carmel	153	8/25	1:00	22	72	16	4.62	52
	A						4.71	53

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Textile Works	Paper Mills	Metal Works
New Haven (part)	45,000	Complete	45,000	..	2	5
Augerville	100	None	0	..	..	..
Centerville	200	Factory	100	1	..	1
Mt. Carmel	400	Factory	200	..	..	2
Cheshire	500	Private	100	..	..	..
Total	46,200		45,400	1	2	8


NEW HAVEN
AUGERVILLE
CENTERVILLE
MT. CARMEL
DILUTION - CU.FT. PER SEC. PER 1000 POPULATION
LAKE WHITNEY DAM
FLOW - CUBIC FEET PER SECOND PER LOW SIX MONTHS
ESTIMATED POPULATION
DENOTES AN IMMEDIATE TEST
* A TEST AFTER 24 HRS
DISSOLVED OXYGEN PARTS PER MILLION
MILES
MILL RIVER

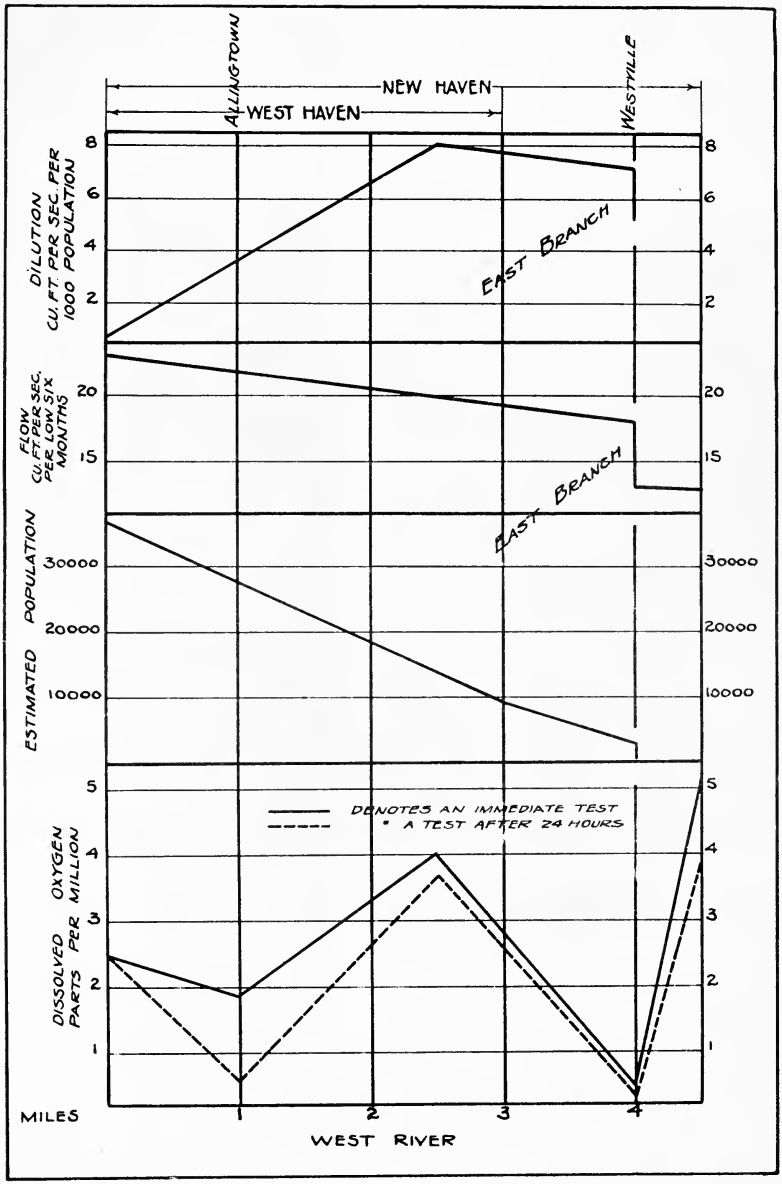
THE WEST RIVER.

The West River flows into the New Haven Harbor. It has a drainage area of about 37 square miles. It is a sluggish stream in its lower reaches and flows through salt meadows. Its upper portion has considerable fall and several dams and mill ponds are located on it. It receives the wastes of fertilizing factories in West Haven and of factories and paper mills in Westville. Two storm overflow sewers from the New Haven system discharge into it. The condition of the river is bad.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

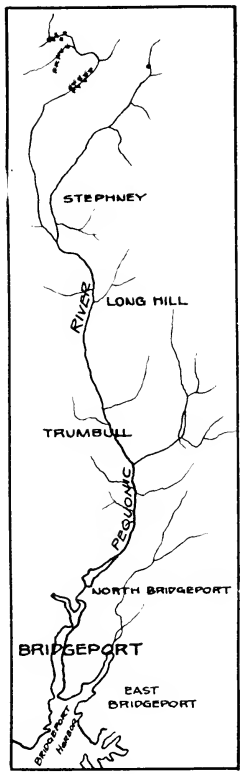
Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	200	9/3	10:15	24	75	1	2.45	28
	A						2.45	28
At Allingtown	157	8/25	4:00	24	75	3	1.88	22
	A						.56	6
Below Westville	156	8/25	3:30	24	75	12	4.05	47
	A						3.67	43
Lower portion of Westville	155	8/25	3:00	24	75	1	.471	5
	A						.282	3
Above Westville and Pond Lily Laundry	154	8/25	•2:40	24	75	0	5.18	60
	A						3.86	45

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures				
				Dye Works	Laundries	Rendering Works	Soap Works	Metal Works
West Haven	8,543	Partial	6,000	..	..	2	..	..
New Haven	25,000	Complete	25,000	..	..	..	1	1
Westville	3,000	Factory	2,500	1	1	..	..	4
Total	36,543		33,500	1	1	2	1	5

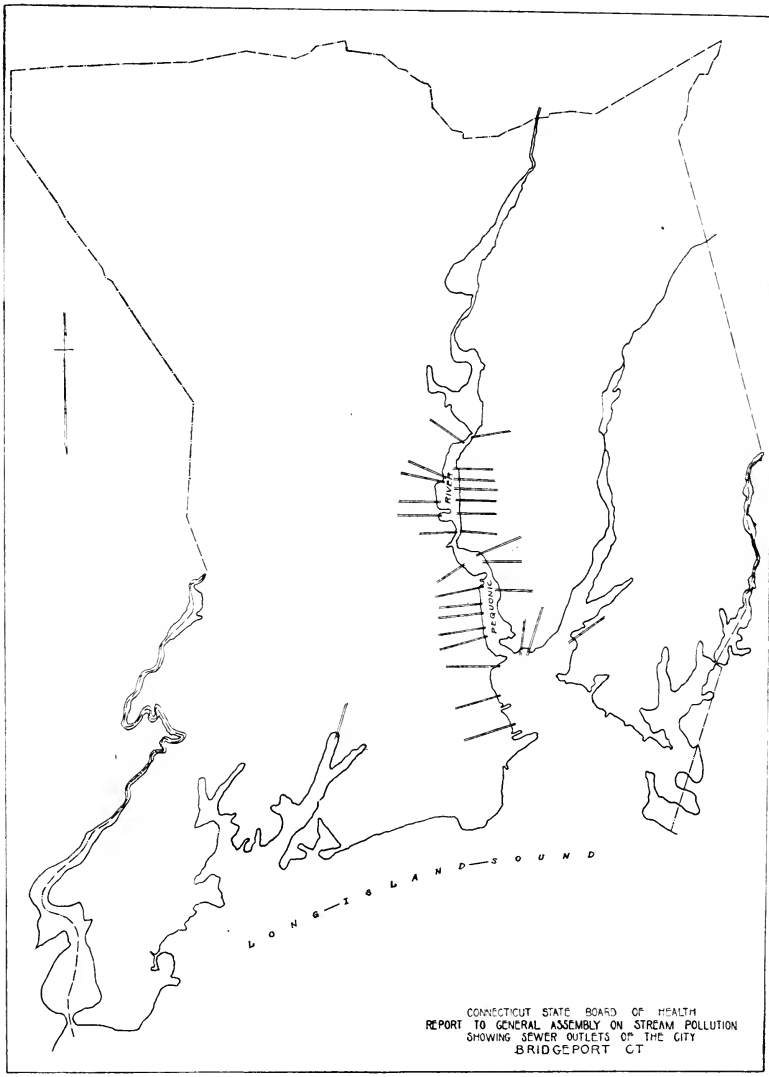

ALLINGTOWN
NEW HAVEN
WEST HAVEN
WESTVILLE
DILUTION
CU. FT. PER SEC. PER
1000 POPULATION
8
6
4
2
EAST BRANCH
FLOW
CU. FT. PER SEC.
PER LOW SIX
MONTHS
20
15
EAST BRANCH
ESTIMATED POPULATION
30000
20000
10000
DISSOLVED OXYGEN
PARTS PER MILLION
5
4
3
2
1
DENOTES AN IMMEDIATE TEST
" A TEST AFTER 24 HOURS
MILES
1
2
3
4
WEST RIVER

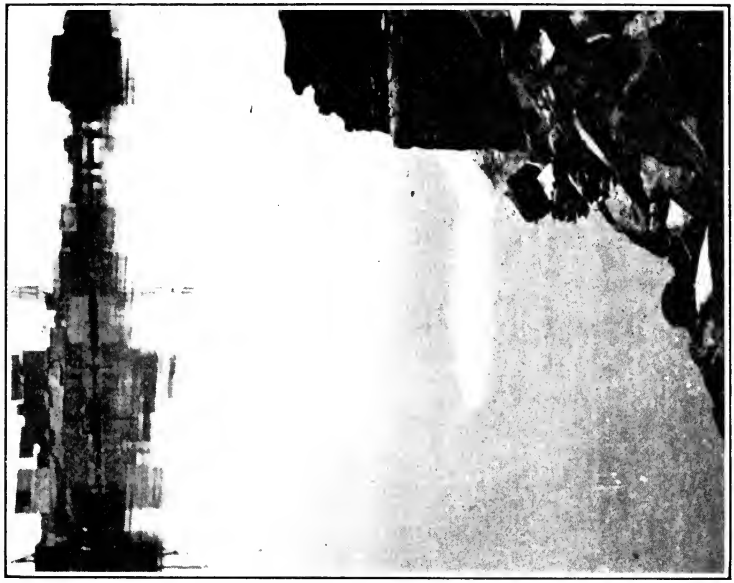
THE PEQUONIC RIVER.

The Pequonic River flows into Bridgeport Harbor. It has a drainage area of about 36 square miles. It is a sluggish stream and its lower portion is tidal up to Berkshire Dam. The river is

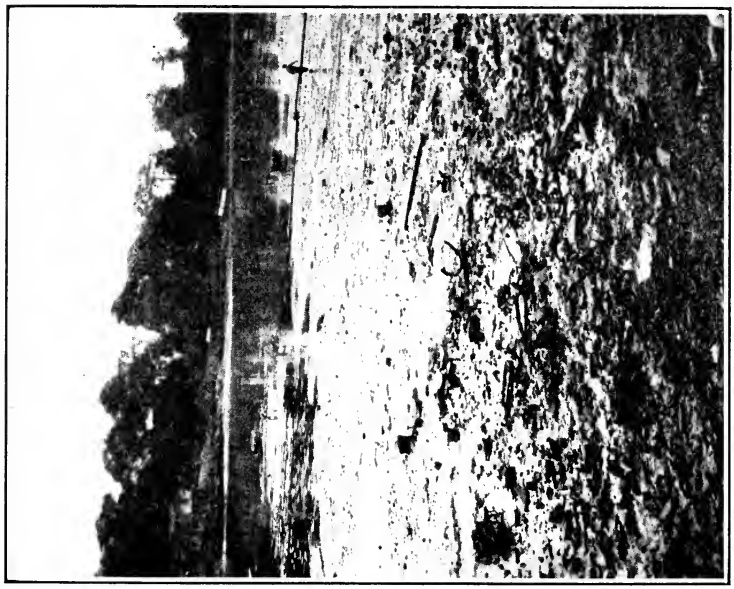


very badly polluted all along Bridgeport; 23 sewer outlets empty into it in a distance of one and one-half miles. The water is badly discolored and at periods of low water the odor is extremely offensive.

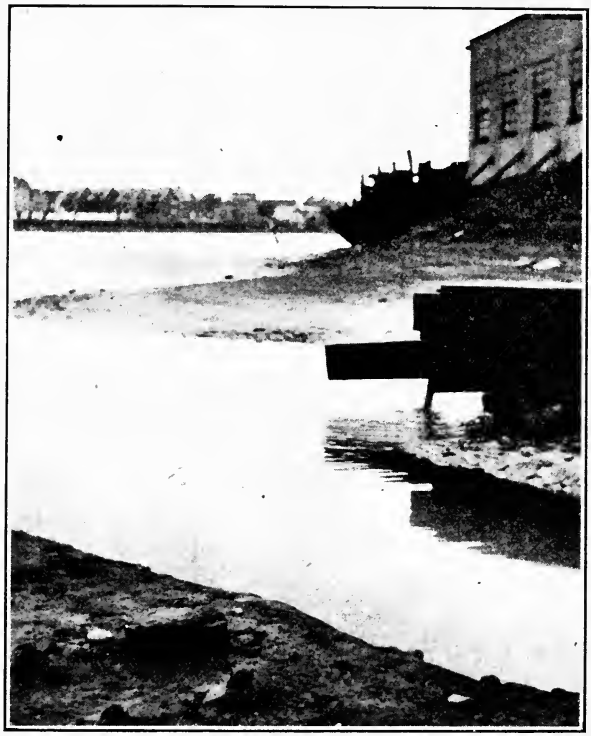

PEQUONNOCK R.
LONG ISLAND SOUND
CONNECTICUT STATE BOARD OF HEALTH
REPORT TO GENERAL ASSEMBLY ON STREAM POLLUTION
SHOWING SEWER OUTLETS OF THE CITY
BRIDGEPORT CT



PEQUONIC RIVER, BRIDGEPORT.



PEQUONIC RIVER, BRIDGEPORT.

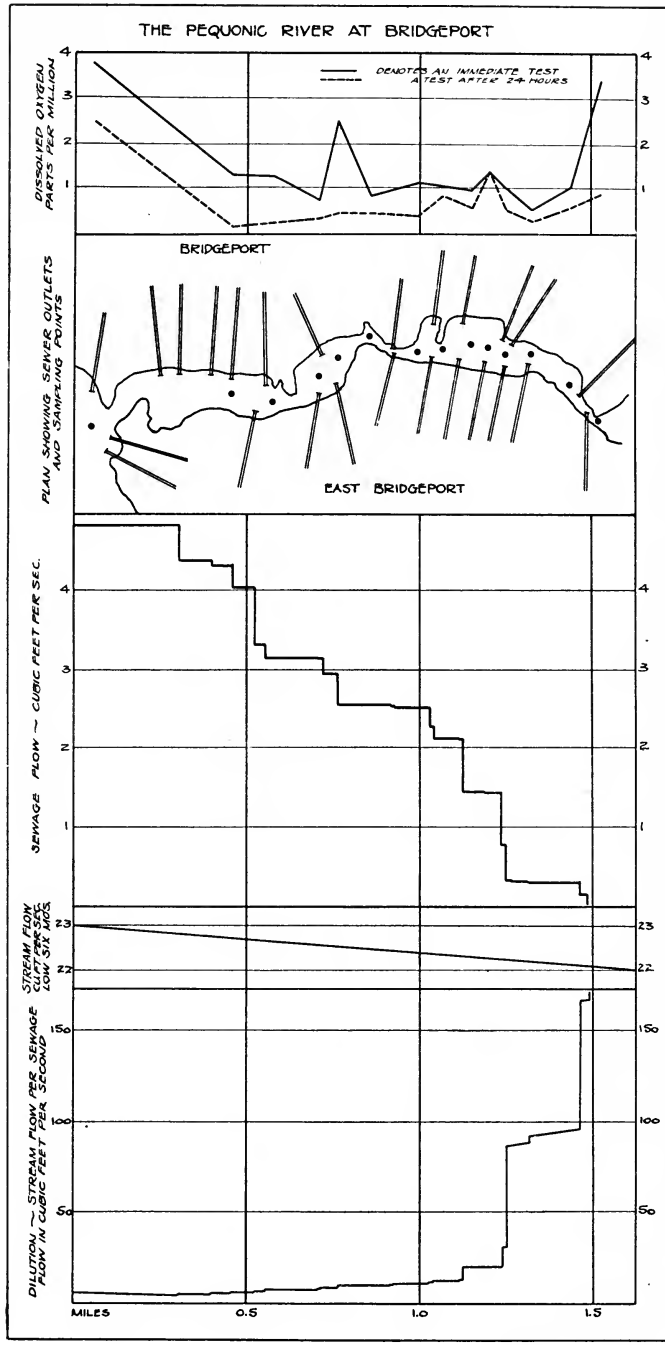


YELLOW MILL POND, BRIDGEPORT.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

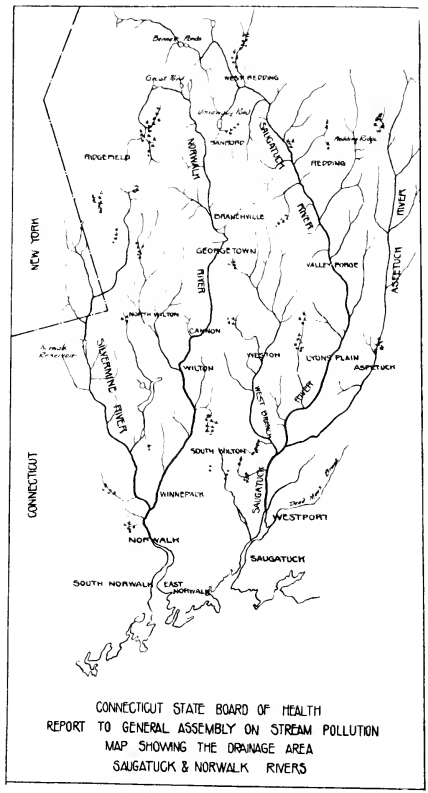
Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth, opp. N. Y., N. H. & H. R. R. Freight Yards	272	9/29	1:15	18	64	12	2.51	26
	A						3.81	39
Below Salts Textile Company	271	9/29	1:00	18	64	14	1.30	13
	A						0.18	1
Oppo. McNeil Coal Co.	270	9/29	12:50	18	64	18	1.30	13
	A						0.27	2
Below Congress St. Bridge	269	9/29	12:40	18	64	0	0.74	7
	A						0.37	3
Oppo. Bridgeport Crucible Co.	268	9/29	12:30	18	64	3	2.51	26
	A						0.46	4
Oppo. Conn. Web & Buckle Co.	267	9/29	12:20	18	64	0	0.83	8
	A						0.46	4
Oppo. Sprague Ice & Coal Co.	266	9/29	12:10	18	64	25	1.11	11
	A						0.37	3
Below East Washington Ave. Bridge.	265	9/29	12:00	18	64	0	1.02	10
	A						0.83	8
Oppo. F. Miller Lumber Co.	264	9/29	11:55	18	64	3	0.93	9
	A						0.55	5
Oppo. Armstrong Mfg. Co.	263	9/29	11:45	18	64	1	1.39	14
	A						1.39	14
Oppo. A. W. Burritt Lumber Co.	262	9/29	11:30	18	64	1	1.02	10
	A						0.55	5
Oppo. J. A. Black Coal & Wood Co.	261	9/29	11:15	18	64	4	0.55	5
	A						0.27	2
Oppo. Berkshire Coal Yard	260	9/29	11:00	18	64	2	1.02	10
	A						0.55	5
Above Berkshire Coal Yd., above Dam	221	9/10	4:25	23	73	3	3.39	39
	A						0.84	9
At Trumbull	222	9/29	4:50	23	73	0	6.22	71
	A						4.05	46
Yellow Mill Pond, Bridgeport	220	9/10	3:45	23	73	1	2.16	24
	A						0.84	11

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures. Silk Mills	Breweries	Toxtile Works	Galvanizing Works	Dye Works	Gas Works	Laundries	Fertilizer Works.	Paper Mills	Slaughter House	Soap Works	Metal Works
Bridgeport	114,447	Complete	114,400	1	3	6	5	2	2	10	1	8	2	1	83
N. Bridgeport,	200	None	0	..	..	..	..	..	..	..	..	..	..	..	..
Trumbull	100	None	0	..	..	..	..	..	..	..	..	..	..	..	..
Long Hill	100	Factory	50	..	..	1	..	..	..	..	..	..	..	..	..
Stepney	100	None	0	..	..	..	..	..	..	..	..	..	..	..	..
Total	114,977		114,450	1	3	7	5	2	2	10	1	8	2	1	83

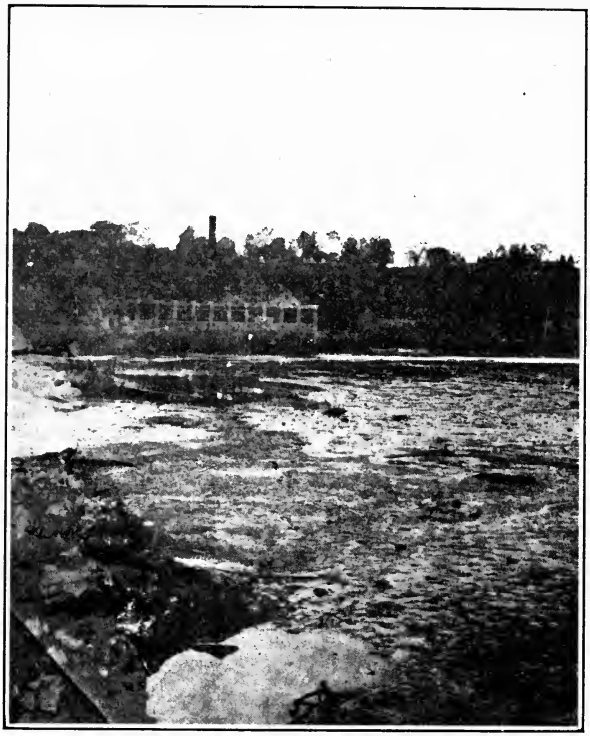

THE PEQUONIC RIVER AT BRIDGEPORT
DISSOLVED OXYGEN PARTS PER MILLION
DENOTES AN IMMEDIATE TEST
A TEST AFTER 24 HOURS
BRIDGEPORT
PLAN SHOWING SEWER OUTLETS AND SAMPLING POINTS
EAST BRIDGEPORT
SEWAGE FLOW ~ CUBIC FEET PER SEC.
STREAM FLOW CUBIC FEET PER SEC. ON INCOMING TIDE
DILUTION ~ STREAM FLOW PER SEWAGE FLOW IN CUBIC FEET PER SECOND
MILES
0.5
1.0
1.5

THE SAUGATUCK RIVER.

The Saugatuck River enters Long Island Sound at Westport. It has a drainage area of about 95 square miles. It is a shallow



stream in some portions and flows through a hilly wooded region. The river does not show much sign of pollution except along Westport and below West Redding.



SAUGATUCK RIVER, WESTPORT.

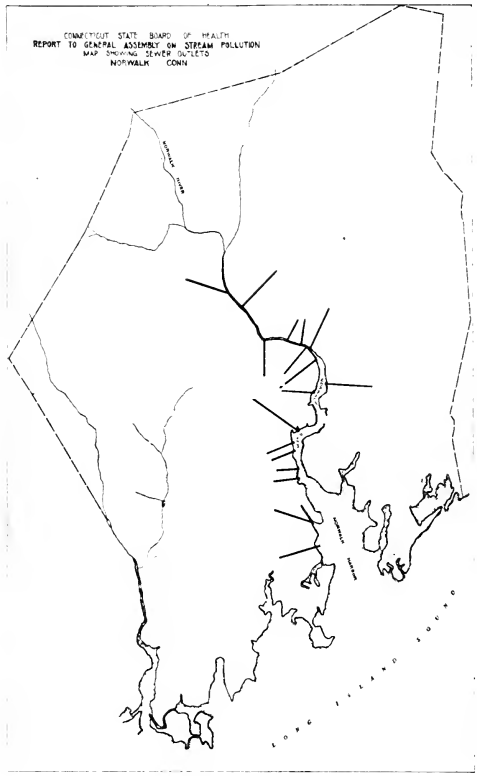
SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth (Saugatuck)	229	9/15	11:30	24	75	0	2.86	45
	A						3.58	41
At Westport	230	9/15	12:30	24	75	0	3.48	40
	A						1.69	19
Below Entrance of West Branch	231	9/15	1:45	24	75	0	8.86	103
	A						7.92	92
Above Entrance of Aspetuck River	233	9/15	2:45	22	72	0	10.46	118
	A						8.01	90
At Lyon Plains	234	9/15	3:45	19	66	0	7.73	82
	A						8.20	87
At Valley Forge	235	9/15	4:45	19	66	0	8.20	87
	A						7.54	80
Below West Redding	236	9/15	5:30	17	63	0	5.65	58
	A						4.71	48

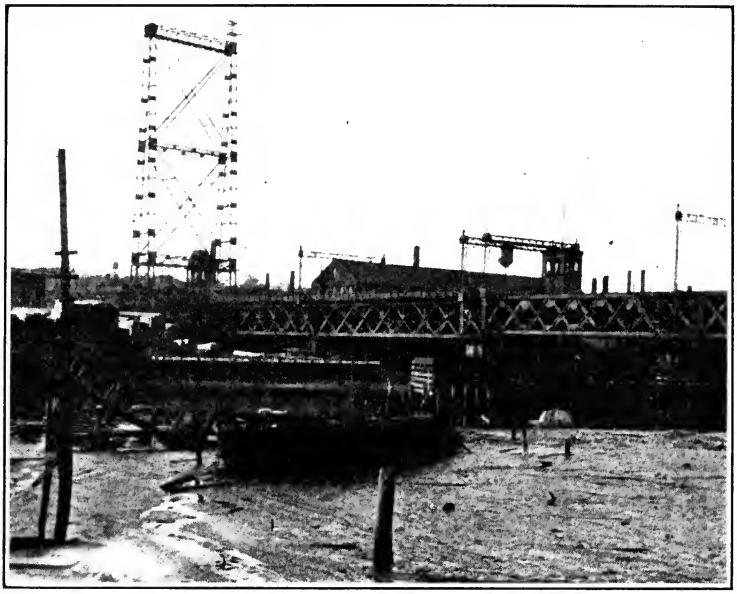
Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures			
				Textile Works	Paper Mills	Starch Works	Metal Works
Saugatuck	1,500	Factory	500	1	..	..	2
Westport	2,500	Factory	1,000	1	1	1	2
Weston	100	None	0	..	..	..	..
Lyon Plains	100	None	0	..	..	..	..
Aspetuck	100	None	0	..	..	..	..
Valley Forge	100	None	0	..	..	..	..
Redding	100	None	0	..	..	..	..
West Redding	100	None	0	..	..	..	..
Total	4,600		1,500	2	1	1	4

THE NORWALK RIVER.

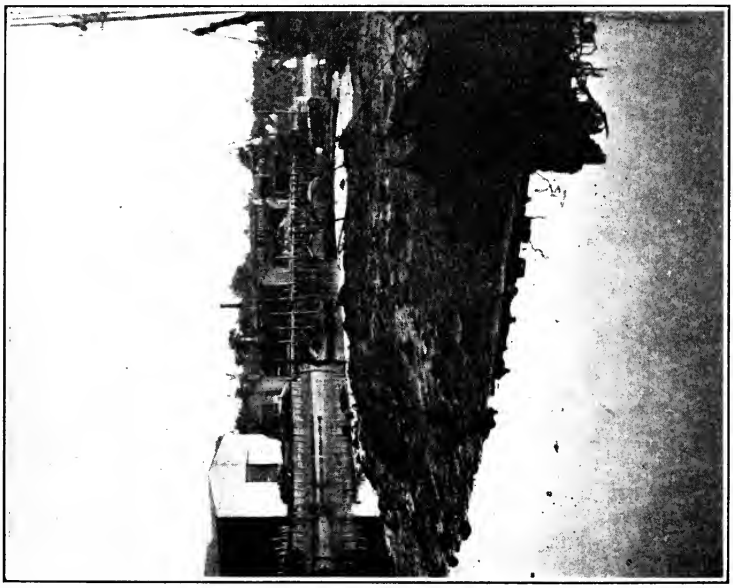
The Norwalk River flows into Norwalk Harbor. It has a drainage area of about 63 square miles and in its upper reaches



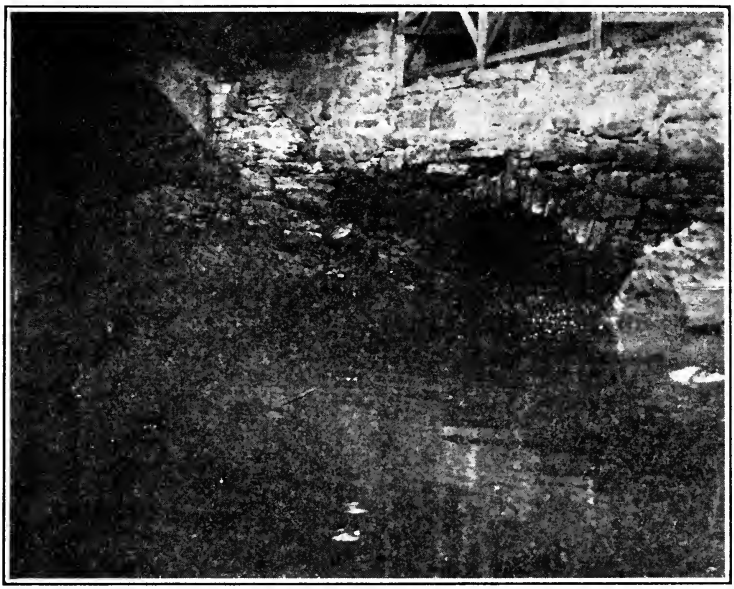
flows through a hilly, well wooded country. The river is badly polluted from South Norwalk to Norwalk and is very much discolored below Georgetown.



NORWALK RIVER, SOUTH NORWALK.



NORWALK RIVER, NORWALK.



NORWALK RIVER, NORWALK.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

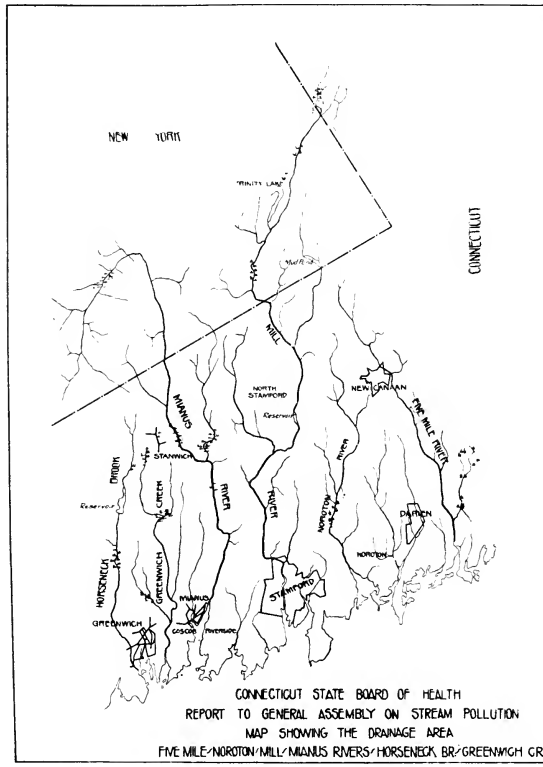
Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth (Norwalk Harbor)	250	9/18	3:45	22	72	0	4.92	55
	A						3.25	36
At South Norwalk	251	9/18	4:00	22	72	0	3.44	38
	A						2.60	29
At Norwalk	252	9/18	4:30	22	72	0	2.79	31
	A						0.93	10
Below Winnepaug	240	9/17	11:00	22	72	17	7.62	87
	A						5.24	60
At Wilton	239	9/15	6:45	18	64	0	6.33	66
	A						6.60	69
Below Georgetown	238	9/15	6:25	15	59	0	8.48	83
	A						6.21	61
Below Sanford Station	237	9/15	6:00	15	59	0	6.78	66
	A						5.84	57

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures: Metal Works	Paper Mills	Laundries	Textile Works	Silk Mills	Hat Factories	Galvanizing Works	Chemical Works	Rubber Works
South Norwalk	4,450	Partial	4,000*	6	2	1	4	..	11	1	1	1
Norwalk	7,200	Partial	7,000	8	2	1	6	3	..	..	..	..
Winnepaug	200	None	7,000	..	..	..	..	..	..	..	..	..
South Wilton	100	None	..	..	..	..	..	..	..	..	..	..
Wilton	100	None	..	..	..	..	..	..	..	..	..	..
Cannon	100	None	..	1	..	..	..	..	..	..	..	..
Georgetown	400	Factory	100	2	..	..	..	..	..	..	..	..
Branchville	200	Factory	100	..	..	..	..	..	..	..	..	..
Sanford	50	None	..	..	..	..	..	..	..	..	..	..
Total	12,800		11,200	17	4	2	10	3	11	1	1	1

*Not sewage from South Norwalk empties into Norwalk Harbor.

THE FIVE MILE RIVER.

The Five Mile River enters Long Island Sound at Rowayton. It has a drainage area of about 23 square miles and flows through



a hilly region in its upper portion. The river is in fair condition except at its mouth and below New Canaan.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	249	9/18	2:45	22	72	0	5.58	63
	A						5.20	58
Below West Norwalk	242	9/17	12:10	23	73	12	6.23	71
	A						5.57	64
Below New Canaan	241	9/17	12:00	23	73	3	5.08	58
	A						4.75	54

THE NOROTON RIVER.

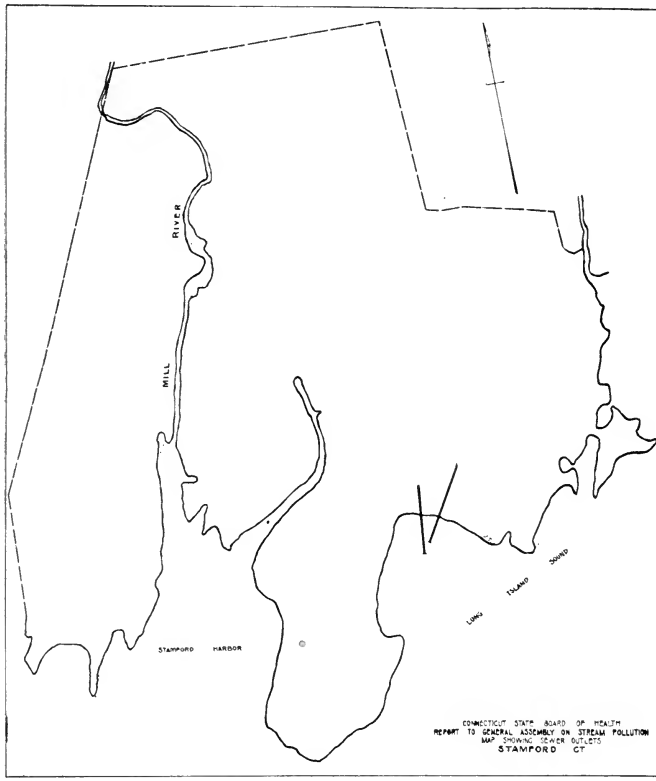
The Noroton River enters Long Island Sound between Noroton and Stamford. It has a drainage area of about 13 square miles. It flows sluggishly through a rolling country. There are no towns on this river but several highways border the river with scattered houses on them.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	246	9/18	11:50	22	72	0	2.54	28
	A						6.20	29
Above R. R. Bridge near Mouth	243	9/17	2:45	25	77	0	6.06	72
	A						3.93	46
At Darien and New Canaan Boundary	244	9/17	4:00	23	73	15	5.57	64
	A						4.51	51

THE MILL RIVER (Fairfield County).

The Mill River enters the Sound at Stamford. It has a drainage area of about 30 square miles. It flows slowly through a roll-



ing well wooded region. Stamford is about the only town from which it receives pollution, at which place the condition of the river is not very good.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth	248	9/18	12:50	22	72	1	4.26	48
	A						4.46	50
Upper Portion Stamford	253	9/24	9:00	17	63	4	4.46	45
	A						4.65	47
Above Stamford	254	9/24	9:30	17	63	2	7.44	76
	A						5.67	58
Below North Stamford	328	11/24	3:30	2	36	16	7.69	55
	A						7.12	51

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures. Silk Mills	Textile Works	Gas Works	Laundries	Paper Mills	Metal Works
Stamford	28,836	Complete	100*	1	3	1	3	2	10
North Stamford	100	None	0	..	..	..	..	..	..
Total	28,936		100	1	3	1	3	2	10

THE MIANUS RIVER.

The Mianus River flows into Cos Cob Harbor. It has a drainage area of about 30 square miles. It is a sluggish stream flowing through a rolling region of meadow and farm land. It is badly polluted in its lower portion and its condition is particularly bad at Mianus where it receives the wastes from a large textile factory.

* Stamford discharges its sewage into Long Island Sound through two outlets. (See map.)

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
At Mouth (Cos Cob)	259	9/24	11:30	20	68	7	2.11	12
	A						1.02	11
Above Mianus	255	9/24	10:35	18	64	9	0.0	0.0
	A						0.0	0.0
Above Mianus Mfg. Co.	256	9/24	11:00	18	64	1	7.71	80
	A						5.85	61
Below Stanwich	258	9/24	12:20	17	63	0	6.88	70
	A						6.97	70
Opposite Stanwich	257	9/24	11:50	17	63	8	6.51	66
	A						6.69	68

Name of City or Borough	Estimated Population 1914	Sewerage System	Estimated Sewage Population	Statistics of Manufactures Textile Works
Mianus	300	Factory	200	1
Stanwich	100	None	0	..
Total	400		200	1

GREENWICH CREEK.

Greenwich Creek enters Indian Harbor just east of Greenwich. It has a drainage area of about 10 square miles. At its mouth it shows signs of pollution but for the remainder of its course its condition is not bad.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	324	11/24	11:00	4	39	5	5.51	41
	A						10.07	77
Above Greenwich	327	11/24	12:40	1	33	11	6.93	48
	A						10.54	74

HORSENECK BROOK.

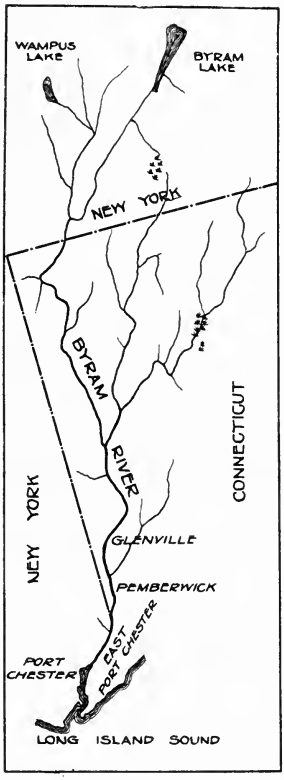
Horseneck Brook enters Greenwich Harbor. It has a drainage area of about eight square miles. It is badly polluted at its mouth but above, its condition is not objectionable.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth	323	11/24	10:20	5	41	11	4.46	34
	A						7.88	61
Opposite Greenwich Center	325	11/24	11:45	2	36	2	7.69	55
	A						11.59	83
Above Greenwich	326	11/24	12:10	2	36	7	7.12	51
	A						11.59	83

THE BYRAM RIVER.

The Byram River enters Long Island Sound at Portchester, and is for the most part a shallow stream flowing through a rugged well wooded region. It is tidal for a distance of about one and one-half miles from its mouth and has a drainage area of about 30 square miles, part of which is in New York state.



During a part of the year the entire flow of the west branch above the state line is diverted into the Bronx River drainage basin. On the date of the examination the river appeared to be in fair condition except below Glenville, where the water was somewhat discolored and at Portchester where it was badly discolored and carried considerable floating matter.

SAMPLING STATIONS AND DISSOLVED OXYGEN.

Location.	Sample Number	Date	Hour	Temperature Centigrade	Temperature Fahrenheit	Colon	Dissolved Oxygen Parts Per Million	Per Cent. Saturation
Mouth at Portchester	355	1/8/15	11:00	0	0	18	6.21	42
	A						7.38	54
R. R. Bridge at East Portchester	356	1/8/15	11:25	0	0	4	6.75	46
	A						8.55	58
At State Line above East Portchester	357	1/8/15	12:10	0	0	14	7.65	52
	A						8.55	58
At Pemberwick	358	1/8/15	12:50	0	0	8	7.83	53
	A						8.55	58
At Glenville	359	1/8/15	1:25	0	0	17	6.57	44
	A						13.41	91
One and one-half miles above Glenville	360	1/8/15	2:15	0	0	0	7.74	52
	A						13.50	92
Below State Line	361	1/8/15	3:25	0	0	21	5.49	37
	A						12.06	82

Name of City or Borough	Estimated Population 1914	Sewage System	Estimated Sewage Population	Statistics of Manufactures. Textile Works	Metal Works
Portchester, New York	15,095	Partial	15,000	?	?
East Portchester	1,000	Partial	500	..	..
Pemberwick	100	None	0	..	..
Glenville	200	Factory	100	1	1
Total	16,395		15,600	1	2

From the foregoing investigation the Board concludes that with few exceptions all the streams of the state give evidence of pollution. In the case of large streams like the Connecticut, Thames and Housatonic the flow is so large and the volume is increased so greatly by the influx of salt water at each tide, on those portions which are tidal, that the dilution is sufficient, at present, to take care of the sewage and wastes from the different cities on them, provided the outlets discharge far enough out from the shore to provide quick and adequate mixing and dispersion of the wastes and to permit their being carried away by the tidal currents. Unfortunately this condition is not true of most towns; the outlets discharge at the banks of the river and very often

above low water mark, the result being the formation of banks of foul smelling sludge and solids and excreta floating on the surface. Only three of the large cities, Meriden, New Britain, and Danbury treat their sewage before discharging it into the streams. Of the smaller towns the following have adopted some method of treatment—Bristol, Litchfield, Manchester, South Manchester, Norfolk, Canaan, Ridgefield, Rockville, Simsbury, Southington, West Haven, and Greenwich. Within the next few years many towns will be obliged to install some kind of plant and it is very important that the type of such installation should be passed on by some state board, in order that the rights of adjoining towns and the public at large be protected. In nearly every river the amount of oxygen present is dangerously near the limit at which major fish life ceases to exist, and the constant presence of the B. coli is evidence of contamination by human or animal excreta. Most all the smaller rivers flowing into the Sound seemed badly polluted and in all the amount of dissolved oxygen is surprisingly low; and former investigations of the Board have shown that the condition of many of the harbors needs immediate attention.

The streams which extend beyond the borders of the state into Massachusetts all show signs of pollution caused by the discharge of sewage and manufacturing wastes from the towns situated on their drainage areas above the state line.

Industries, the waste of which are particularly responsible for the pollution of streams are bleacheries, woolen mills, cotton mills, breweries, distilleries, canning factories, creameries, dye works, commercial laundries, galvanizing works, galvanized wire works, gas works, paper mills, rendering works, saw mills, slaughter houses, soap works, starch factories, tanneries, vinegar factories, and wood-alcohol works.

The waste liquors from cotton, flax, hemp and jute bleacheries are in general only slightly polluting, except that which is discharged from the kiers. The amount discharged per 1,000 pounds of cloth is about 15,000 gallons. The liquor from cotton waste bleacheries are about the same as from cotton with the addition of large amounts of grease; about 24,000 gallons are discharged in treating 1,000 pounds of cloth. The wastes from wool washing vary from 24 to 224 gallons per 100 pounds of wool, the more polluting wastes coming from the steeping-tanks. All of these wastes are detrimental to the purity of the streams and before being discharged should receive treatment, if not for sanitary reasons, at least for economic, for the value of the by-products recovered will not only pay the cost of treatment but often may be made to yield a substantial profit.

The greatest source of pollution from breweries is the barrel washings, and the yeast from the fermentation tanks. The barrels often contain sour beer and hops. The yeast liquors are

liable to undergo rapid decomposition with the formation of acetic, lactic and butryic acids, whose smell is very offensive. The discharge varies from 125 to 600 gallons per 100 gallons of beer brewed. In addition to wastes already mentioned in brewing, distilleries contribute the distilling wash and distilling of low wines. From this process a very dark brown liquor which undergoes rapid putrefaction accompanied by acid fermentation is discharged.

The wastes from dairies and creameries is similar in character to dilute milk and is very liable to undergo fermentation and give off offensive odors from the butyric acid formed. If the flow of the stream is small abnormal growths develop, which cause great nuisances when they decay. The amount of refuse discharged is about 400 gallons to every 100 gallons of milk used.

In dyeing most of the coloring matter consists of derivatives of coal tar except in indigo dyeing. The principal pollution occurs when it is necessary to change to another color, then a fresh vat must be prepared and the old one is generally discharged into the river. By use of improved machinery most of the pollution from the process of dyeing can be avoided.

The refuse discharged from commercial laundries is very polluting and often much stronger than domestic sewage. It putrifies rapidly and causes profuse offensive growths in a stream.

The principal pollution in galvanizing is the wastes from the pickle tank, which is a muddy liquid containing large amounts of oxide of iron in suspension and in solution either chloride or sulphide of iron and some free acid. When discharged into the stream they form a reddish brown deposit on its bed and owing to their acidity render the water incapable of supporting fish or vegetable life or of being used for industrial purposes. In galvanizing wire-works there is in addition to the above the escape of milk of lime.

The spent liquor from gas works has a brown color and an offensive smell. It contains large quantities of acidic and basic tar oils and noxious sulphur compounds. When discharged into a small stream it renders the water poisonous to fish and cattle as well as odorous and discolored. It also absorbs large quantities of oxygen and so interferes with self-purification of the streams. The amount of spent gas liquor discharged per 100 tons of coal converted into coke is about 12,000 gallons.

The character of wastes from paper mills varies largely with the nature of raw materials used in manufacturing. In the caustic soda process, where the supply of water is unlimited, it may run as high as 80,000 gallons to each ton of paper produced and consists of lime liquor from the boilers, dirty water from the rag engines and excess water from the paper machines. In general the amount of wastes varies from 30,000 to 150,000 gallons per ton of paper. In

the wood pulp process there is a discharge of nearly a ton of solids dissolved in the refuse water for every ton of paper pulp produced. All this may give rise to very great nuisance when discharged into a stream. The solids in suspension are deposited on the beds of the river where they ferment and decompose, giving off offensive gases.

The refuse from the rendering works is exceedingly polluting in character. The waste liquor contains large quantities of chloride of calcium in solution, and the waste water from the floors, vats, and casks carries large amounts of animal matter in solution and suspension.

The water used for cleaning the floors, etc., in slaughter houses is strongly impregnated with organic matter and is extremely liable to undergo offensive putrefaction when discharged into a stream.

The principal source of pollution in the manufacture of soap was the discharge of the spent lye, but in the modern process this is saved for the recovery of glycerine and the only possible pollution is the discharge of waste water produced by the evaporation-distilling process in reclaiming the glycerine and the wash from the floor.

The refuse from tanneries is the waste waters from the soaks, the limes, the bates or puers, the spirit liquors from the tan-pits and the wash water. All these form a waste of the most polluting character. The tannin from the spirit liquor absorbs oxygen very rapidly and is very detrimental to the purity of the stream. The volume of refuse from tanneries amounts to from 16,000 to 30,000 gallons to every 250 hides dressed.

The recent increase in the use of tar and oils for sprinkling the highways in attempting to remedy the dust nuisance has created another possible source of pollution of streams. If the spraying is followed by a period of dry weather, pollution is not likely to occur, but if it is followed by heavy rains the soluble matters in tar and oils are washed out, and should they reach the streams, it would occasion great destruction of fish life.

In the purification of water by sand filtration, to prevent clogging of filters, the surface layer of sand has to be removed from time to time and thoroughly washed. This sand-washing water carries in suspension, mud, vegetable growths, dead organisms and bacteria, which if discharged into a small stream, may occasion objectional pollution.

Connecticut is largely a manufacturing state and on account of the excellent water power available many of these industries are situated on the rivers. These industries are of great value to the state and no action restricting them in the legitimate use of the streams to dispose of their wastes should be considered, when, however, their use of the stream is such as to menace public

health or offend decency there should be no hesitation in stopping it. The rights of the public should be supreme at all times. But the mistaken idea that the interests of public health and manufacturing industries are diametrically opposed should be dismissed, it has been one of the greatest obstacles in preventing the correction of pollution in our streams. Each needs the assistance of the other and they should work hand in hand solving the problem.

It must be evident that the question of pollution of rivers is a very live one, whether we look at it from the point of protecting the health of the public or from the side of public decency and the conservation of fish life. Even where purification works have been installed it is of considerable importance to have the water coming to the filter as free from organic matter as possible, in order not to overload the filter, and make the cost of purification exceedingly high.

Cincinnati, Buffalo, Philadelphia, New York, and many cities of second magnitude throughout the country are studying the problem and preparing to treat their wastes so they may be discharged into adjacent bodies of water without endangering public health, or creating a nuisance. In Connecticut some of the larger cities are working on the same problem. Naturally these studies are of each city's particular problem and generally too little consideration is given to the rights of adjoining towns or the public at large. The need of some state body to pass upon the larger problems of intertown and interstate rights seems very plain and from its statutory prerogatives that body would naturally be this Board. In accordance with this assumption and pursuant to your instructions we have prepared and will introduce legislation designed to remedy the present conditions in the waters of the state and prevent their pollution in the future.

EDWARD K. ROOT,
ALBERT W. PHILLIPS,
LEWIS SPERRY,
ARTHUR J. WOLFF,
LOUIS J. FONS,
J. FREDERICK JACKSON,
JOSEPH H. TOWNSEND,
State Board of Health

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