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Water-Pollution

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POLLUTION OF WATERWAYS BY SEWERAGE

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DEVELOPEMENT OF THE PROBLEM

Disposition of waste is a problem that has been with the human race since mankind quit a nomadic existence, and became more or less permanently located.

With concentration of populations into cities and towns, the old method of disposition of our waste and sewerage by pouring it into the public streets became intollerable. European cities during the middle ages were swept again and again by pestilences largely traceable to this failure to properly dispose of waste. Civilization with proper regard for the health and comfort of mankind, demanded some sanitary disposition of such waste

The answer to this demand, as far as sewerage is concerned, was the modern sewerage system. The advent of water systems made possible the disposition of such wastes by dilution, and this for a time solved the problem as far as conveying our domestic and industrail wastes away from sight and mind, and removing their immediate and direct menace to public health.

The sewerage system disposed of its contents by discharging it at some convenient point into a river, lake or other natural waterway, and let nature take care of it from that point on.

Fortunately waterways possess power of natural or self purification, which transforms limited amounts of sewerage of a domestic type by a process of oxidation. A stream in the course of several miles, depending upon the type of sewerage and the amount of dilution, will totally clean itself of a limited amount of dangerous contamination. It has been estimated that

one-fifth of its volume of sewerage is the most that any stream, under the most favorable conditions can care for.

THE PROBLEM

Natures capacity for safe disposition of sewerage in our waterways, however, has its limits. With concentration of vast populations in limited areas, and a corresponding centralization of industries, the volume and variety of sewerage discharged into our waterways has increased so rapidly that they can no longer offer proper dilution to the mass, and our streams have become in many instances mere open sewers, objectionable from a hygienic, commercial and esthetic standpoint.

Polluting substances that are being deposited directly or indirectly into our waterways may be divided into two general classes - Domestic Sewerage and Industrial Wastes.

Domestic Sewerage - Such sewerage in the great majority of cases is discharged into our streams in a raw or untreated state directly through outfall sewers. Domestic sewerage consists of organic and inorganic matter in a solid state in suspension, and in solution. It also contains great numbers of bacteria, the majority of which are harmless but necessary in the natural processes of decomposition of the organic matter.

Industrail Wastes - Wastes resulting from industrial processes generally originate either as a by-product from a chemical or mechanical reaction, or as an end product which is not commercially feasable or mechanically possible to recover. Spent chemical solutions used in the various industrial processes are also often wasted.

Description of same of the wastes we have to contend with in Maine:

Oil -	Secretary	of	War,	P.	3
Pulp and Paper -	"	"	"	"	7
Tanneries -	"	"	"	"	8
Textile Industries -	"	"	"	"	8
Miscellaneous -	"	"	"	"	8

It is estimated that Domestic Sewerage constitutes 90 per cent of the total volume of pollution substances.

When streams are unable to oxidise the sewerage turned into them, the accumulation of decomposable organic matter soon turns the whole watercourse into a fermenting pool.

EFFECTS OF POLLUTION

1. Public Health:

Foremost among the deleterious influences exerted by stream pollution is the contamination of public water supplies. In many parts of this Country communities are dependent for their water supplies upon the same waterways into which sewerage is discharged by their own or other sewerage systems. The first real awaking came when it was established that sources of drinking water were being so defiled by this ever increasing dumpage of filth that these waters were laden with disease germs causing epidemics of typhoid, dysentery, cholera and other water borne diseases. Pure water in many communities is at a premium, and can be obtained only through expensive processes of treatment which at the best provide a barely potable supply.

To overcome these conditions of contamination vast sums have been spent by some municipalities for filtration and other water treatment plants, but regardless of their efficiency the idea of using for houehold purposes water from streams heavily loaded with sewerage is repugnant. Other municipalities have been forced to abandon their natural and near by water supplies and to go ever increasing distances, at great expense, to obtain an uncomtaminated supply. Thus pure water, which for generations has been recognized as everone's natural right, has become expensive and difficult to obtain.

Not long ago Wade Hampton Frost, distinguished surgeon of the United States Public Health Service pointed out that with

the continued rapid growth of urban populations and the resultant increase in pollution, it is inevitable that a point must be reached where water purification plants of the highest attainable efficiency will no longer be able to deliver consistently safe effluents.

2. . Industrial Uses:

A permanent supply of good water is essential to many of our industries for use in manufacturing processes. A Committee of the Pulp and Paper Industry in a report say " No other great American industry is so dependent upon a permanent supply of good water, both for use in manufacturing processes and for power, as the paper industry. An assured supply of satisfactory water has always been a basic factor in the location of pulp and paper mills - - - - - the very future of a pulp and paper mill may depend upon the amount and character of water with which the plant may be economically supplied - - - - - - - The use of water for power in the industry is very large - - - however, the use of water for power in the industry is not nearly so essential as a permanent supply of good water to be used in the manufacture of paper itself. More than seven thousand gallons of chemically purified and filtered water must be available for the manufacture of every one hndred pounds of paper " This means that a one hundred ton mill requires about one million five hundred gallons per day.

Many other industries are likewise dependent upon an abundent supply of good water. So it may readily be seen that any considerable amount of pollution of our waterways might seriously interfere with their use for industrial purposes.

3. Recreation.

The large quantity of Organic matter contained in domestic sewerage on enetering our streams become subject to slow decomposition or putrefaction through the action of bacteria, causing a nuisance offensive to the senses and unsightly.

The industrail wastes poured into our streams charges them with quantities of oil, annimal tissue, vegatable matter, tars acids and dyes.

The wholesome recreations of boating and bathing are seriously jeopodized by pollution. Pleasure boating has been driven from many of our streams and rivers, and bathing made impossible.

The State of Michigan, which is now attacking the pollution problem with drastic legislation and the expenditure of vast sums of money, says that it was stirred to action not only by a realization that pollution seriously threatened the health of the people, but that one of the greatest industries of the State - the resort industry - was threatened through impairment and destruction of fishing, bathing and boating.

4. Fishing

The presence of sewerage and industrial wastes in our waterways in such volume that the pollution density is high, kills, injures or prevents the propogation of fish life, or drives it to more favorable habitations.

A report of the Chief of Engineers of the U. S. Army on pollution as effecting fisheries, says:

" As a general rule the pollution density of the waters in any locality is directly proportionate to the pupulation density of the contiguous territory. In those distdicts which contain large densely poppulated communities, or large industrial centers, the consequent pollution density of the waters of the locality is of a degree sufficient to have a disasterous effect upon fish and shellfish life "

Description:

1. Sec. of War, P. 10.
2. Stream Pollution U. S., P.17

5. Miscellaneous.

Sludge deposits have caused some shoaling of navigable waters. Oil in some localities has endangered communities by creating a potential fire hazzard. Acids have been found to be very injuious to metal hulls and metal structures, and to make water unfit for boiler use.

EXTENT OF POLLUTION

In the more densely populated parts of the United States pollution of our waterways has gone to an extent beyond the conception of the average individual.

Five Hundred Million gallons of sewerage a day, carrying approximately eight hundred tons of organic matter, are discharged into New York Harbor. A Brooklyn newspaper reported that of the fourteen miles of bathing beaches in the Bronx, only two miles are fit for bathing because of pollution.

The Passaic River has a discharge of about a million gallons a day below the Great Falls of Patterson.

Chicago has been sending into the Illinois and Mississippi some fifteen hundred tons of poisonous filth daily.

The Wisconsin rivers are carrying waste from over a thousand industrial plants and two hundred municipal sewerage systems.

The rivers of Pa. are receiving the discharge from twenty-five hundred industrial plants and some five hundred municipalities.

A survey of most of the large rivers on the Atlantic Coast shows fish life to be either destroyed, or seriously injured.

All of the Great Lakes have become seriously polluted. Lake Erie, 250 miles long from Toledo to Buffalo, a little more than 50 miles maximum width, and ranging in depth from 25 to 200 feet, has become a large settling bed for the sewerage of seven million people.

Statistics indicate that at the present time 85 per cent of all our cities with populations of 100,000 or over are us-

ing the waterways for sewerage disposal. This alone represents a population of twenty seven million - the smaller communities will greatly swell the total.

In 36 States with a total population of 91, 000,000, only fifteen million are provided with any form of municipal sewerage treatment.

It has been estimated that 95 per cent of the streams of America are polluted from sewerage.

According to a Committee of the American Water Works, there are in the U. S, and Canada two hundred and fifty water supplies that are affected by industrial wastes alone.

It appears that ten tons of dead fish were recently taken from the Flambeau River, and that most of the aquatic life there has been killed by pollution.

A report of conditions of the Passaic River is typical of the defilement of a pure stream by an unrestricted dumpage of sewerage and industrail wastes in densely settled areas.

Description: Stream Pollution in U. S. Page 3.

OUR PROBLEM IN MAINE

There has been for years practically unrestricted dumpage of sewerage and industrial wastes into our waterways, and the treatment of sewerage has been negligable. Fortunately for the great majority of our streams such concentration of population and industry as we have is principally along four of our principal rivers which have a considerable volume. These rivers, however, which have born the brunt of our pollution, have paid the price, and furnish a striking example of what will surely befall our other waterways with any considerable increase in population and industries unless some decided change is made in our present policy.

In a report of the Chief of Engineers of the U. S. Army on Pollution of Navigable Waters in 1926, under a heading" Navigable Waters into which polluting substances are being deposited to such an extent as to endanger or interfere with navigation, commerce, or fisheries, Maine's rivers are classified as follows:

Waterway.	Sources of Pollution	Effect on Fisheries.
Penobscot - Millinocket to mouth. Piscataquis below Dover	Domestic sewerage - Industrial wastes from canning plants, textile mills and pulp mills	Injurious
Kennebec River - Skowhegan to Mouth	"	"
Androscoggin River - Berlin to mouth -	"	"
Saco River Biddeford	"(except pulp)	"
Portland Harbor	Domestic sewerage - Industrial wastes -	Injurius to shellfish.

In describing present conditions on the Androscoggin, the Lewiston Journal says:

" After the Androscoggin leav s Lisbon Falls, it is little but a common sewer, into which have poured the refuse of more than 100,000 people, and the waste of numerous mills and factories. We have seen the waters of the Androscoggin so full of chemicals at the little bridge on Lincoln Street that a substance that the boys called soap-suds boiled up out of the water of the little cross canal where the water had been churned by the mill wheels above on the main-canal, that this soapy foam filled the canal to the top, rolled over on the embankment, came up over the bridge, rolled out onto Lincoln Street and stood six to eight feet deep in the street itself for rods around. - - - This was said to have come from pulp mills up stream many miles. No fish inhabit our river. We recall seing them leaping under North Bridge forty years ago"

In the Kennebec conditions are such that fish like the salmon that once ran the river in great numbers, no longer return there; the water is unsuitable for bathing, and hardly fit for pleasure boating. In Hamilton vs Madison Water Company - 116 Me. P. 157 - it appears in evidence that samples taken from the Kennebec at Madison in 1915 gave evidence of sewerage pollution and indication of colon bacilli - the water was generally impregnated with sewerage pollution.

These condition prevail on the other two rivers mentioned.

The extent of pollution in our other streams and lakes is unknown, as so far as I know no survey has ever been made to determine that fact.

1. Water Supplies:

In Maine our topography and natural water resources fortunately make it necessary to use but few water supplies which can be considered sewerage polluted. We have, however, in several instances been obliged to resort to filtration plants to procure safe water, and in others to abndon our nat-

ural, nearby supplies, and go to considerable distances at great expense for other sources.

2. Industrial Uses.

One of our principal industries are our pulp and paper plants along our rivers, and this industry with many of our other manufacturing plants requires vast quantities of pure water for use in their manufacturing processes. This must be assured them, if we are to retain them.

3. Recreation.

Maine is expending much time and money in advertising its unsurpassed advantages as a summer playground. If the tourist and vacationist are to come to Maine in increasing numbers, they must be assured of a safe water supply for domestic purposes, and our lakes and streams must retain their attractiveness and purity so that they are suitable for boating and bathing. Our tourist business could not stand a serious typhoid epidemic such as has visited Montreal durming the past year.

The game fish with which our waters abound, and for which we are expending much money to propogate and protect, are one of Maine's greatest assets, and attract countless numbers within our borders. We cannot risk their extermination by pollution.

The State of Michigan is expending vast sums to correct the evils of pollution with an avowed purpose of protecting its great resort industry.

WHAT CAN BE DONE ABOUT IT

Were conditions such as now exist necessary or impossible of correction, we might well be solicitous of the future. However, engineers have long been working on the problem, and have developed effective processes of sewerage purification. Owing to their foresight, scientific methods of disposal are now available which can relieve the waterways of much of the pollution load they have carried for so many years.

1. Domestic Sewerage.

The total volume of domestic sewerage comprises at least 90% of polluting substances. It consists of organic and inorganic matter in a solid state in suspension and in solution.

The main difficulty in sewerage disposal is due to the presence of the organic matter, which although it comprises but one-tenth of one per cent of the total sewerage, constitutes the essentail promlem of sewerage disposal. It is the presence of this small amount of organic matter which necessitates the treatment of sewerage prior to its discharge into our streams where the presence of suspended solids is highly objectionable.

It can be authhoritively stated that domestic sewerage can be scientifically treated by sewerage treatment plants so that it is converted into harmless, fairly clear water, and a dark brown or black earthy substance which is called sludge. This digested sludge is entirely harmless and inoffensive, closely resembling rich loamy earth. It has some value as fertilizer,

and can be used without offense as a filling material. These plants are beyond the experimental stage. Many of them are in operation, and have proved themselves practical and efficient.

The function of a sewerage treatment plant is the conversion of whatever it receives through the sewerage systems into inert and harmless substances by removing solids and carrying out certain changes in the composition of the organic matter, so that the final effluent is in such a state that any further changes which it may undergo can proceed in the receiving stream without detriment to the quality of the water for the purposes for which it is to be used.

The process is a purification of sewerage by oxidation carried on by bacteria or biological organisms in the sewerage itself. Sewerage treatment is an inherently self-contained process, and raw sewerage is transformed into a harless and inoffensive substance without the aid of any chemicals or foreign matterial whatever. The means by which this is accomplished includes screening, sedimentation, aeration, bacterial action, and filtration.

For description of sewerage treatment processes, see "Sewerage Treatment Plants - Page 4.

A sewerage treatment plant has been in operation for several years at the National Home, and has proved a practical and efficient method of restoring to clean, wholesome conditions a stream that was very highly polluted by the discharge of sewerage.

While costs of plants in difference localities and over a period of years vary considerably, it has been found that the

average cost of thirty-two modern plants was $8.14 cents per capita of population served - less by far than the cost of fixtures in the modern bath room. Balanced against the actual monetary losses incurred by pollution, the cost of sewerage treatment is almost negligible.

2. Industrial Wastes.

Wastes resulting from industrial processes generallly originate either as a by-product from a chemical or mechanical reaction, or as an end product which it is not commercially feasable or mechanically possible to recover. Spent chemical solutions used in the various industrial processes are also often wasted.

Industrial waste has been classified as of animal, vegitable or mineral origin. Its polluting effect may be due to the presence of excessive quantities of suspended solids, substances capable of fermentation or putrefation, coloring matters, such as natural or artificial dye stuffs, substances poisonous to aquatic ~~life~~ vegatation or fish life, or oily matters, fat and soap.

Although industrial waste does not usually form the largest percentage by volume of polluting substances, its character and composition make it the most damaging type.

The problem in connection with the ultimate disposition of these wastes is to find some method of reclaiming them as a by product, or some way within reasonable limites of cost of treating them so as to send a harmless effluent into the receiving streams. The problem is not only scientifically complex,

but financially serious. It is estimated that it would cost the coal companies in the Pittsburg area about $3,000,000 per year to neutralize their mine waters sufficiently to reduce the degree of acidity to make the streams non injurious to commerce.

While great progress has been made in recent years towards the utilization and treatment of industrial wastes, the problem is far from solved - in some industries there is not yet any known methodsof treatment that are practical and within reasonable costs.

For a description of the difficulties in treating some of these wastes:

1. Pulp Waste	Stream P. in the U. S.	Page 24
	Report to Gov. of Pa.	" 19
2. Tannery Wastes.	Stream P. in the U. S. P	" 24
	Report to Gov. of Pa.	" 15
3. Laundry Wastes -	" " " " "	" 22
4. Milk and Milk Pro -	" " " " "	" 23

3. Riparian Rights.

It is a principal of the common law that every proprietor upon a natural stream is entitled to the reasonable use and enjoyment of such stream as it flows through or along his own land, taking into consideration a like reasonable use of such stream by all the proprietors above or below him. Any diversions or obstructions which substantially and materially dimimish the quantity of water, so that it does not flow as it has been accustomed to, or which defiles and corrupts it so as to essentially impair its purity, thereby preventing the use of it for any of the reasonable and proper purposes to which it is

usually applied creates a nuisance for which those thereby injured are entitled to a remedy.

I do not find that the question of pollution of streams by sewerage has been before the Maine courts. In Lockwood Company vs Lawrence, 77 Me. P. 297, mill owners on the Kennebec were restrained from depositing wastes from saw mills into the river. In this decision the Court affirms the above principal of common law, and says that in the use of a stream for manufacturing purposes there must necessarily be more or less waste which it would be impossible to exclude from it, and ~~by~~ which by no ordinary care or prudence could be prevented from falling into the stream. The reasonableness of such use of the water must determine the right, and this must be governed by the extent of detriment received by the riparian proprietors below.

In other States the injunction process has been frequently invoked by riparian owners to obtain relief from pollution of waterways.

To summarize, the means are at hand to greatly improve the condition of our polluted waterways, and this will be accomplished whenever there is a general understanding of the problem, backed by a crystallized public opinion.

WHAT IS BEING DONE ABOUT IT

1. Investigations.

The U. S. Public Health Service in its investigation of infectious and contageous diseases, as far back as 1901, directed its attention to a comprehensive study of stream pollution in relation to disease. In 1910 a systematic investigation of the effects of sewerage pollution was begun in the Great Lakes region. Later a survey was made on the Missouri River. This Board has ever since carried on investigations, and made recommendations. Its experiements and findings have materially aided local administrative bodies in their efforts to regulate industrial and domestic pollution.

The International Joint Commission has taken up the question of regulating the pollution of international boundry waters.

The Secretary of War in June 1926 submitted to Congress an exhaustive report on the Pollution of navigable waters.

The Health authorities in the several States, especially in those localities where pollution is most serious, have been active in a study of the problem, and in the application of preventative or remedial measures.

In the past few years a strenuous anti-pollution campaign has been carried on by various organizations interested in safe, clean waterways, and is commencing to bear fruit. To day the subject of pollution of waterways is one that is engaging the active attention of State and municipal governments throughout

the United States.

The Secretary of War in a summary of his recent investigation says: " On the whole conditions due to pollution are undergoing gradual and decided improvement due to an aroused public opinion, the consequent activety of local governments, and the cooperation of the agencies responsisble for the pollution "

2. Legislation.

Perhaps the most effective solution of the problem of stream pollution lies in Legislation, both national and State.

Federal - The trend of Federal legislation has been to prevent the introduction into navigable waters of such material as would form a physical obstruction to navigation. In 1924 Congress passed the Oil Pollution Act which has had a decidedly beneficial effect in decreasing the amount of oil pollution in the harbors and beaches along the coast.

State - Under our system of overnment the responsibility of protecting the public health, and keeping our waterways fit for industrial and recreational uses, lies largely with the States, and it is State legislation that is almost everywhere attacking the problem of pollution with intelligence and vigor.

Practically every State and many municipalities have laws dealing with some phase of the pollution problem within their jurisdictions. The comprehensiveness of these laws seems to depend upon the extent to which pollution has caused conditions that have become intollerable or economically disasterous. In some States the only serious effects of pollution thus far has been in endangering water supplies, and their lws go no farther than

to prohibit pollution of those waters that are used for sources of supply. Others have suffered all the ill effects of highly polluted waterways, and have enacted comprehensive legislation adequate to control pollution affecting either the public health and comfort, or fish and aquatic life.

Michigan in 1925, stating that pollution seriously threatened not only the health of the people, but the great resort industry of the State, enacted drastic legislation requiring both municipalities and industries to submit to the State Board of Health and Conservation, within a prescribed time, definite plans for the treatment of all sewerage.

The Grand Rapids Herald takes the attitude that the legislation is logical and will be followed by other States within a short time. It says (See Opinion of the Press - Page 5 - two paragraphs)

Pennsylvania in 1923 created a Sanitary Water Board in the Department of Health to administer its laws relative to pollution.

Their law requires that permits shall be obtained for all new sewers, sewerage treatment works, and for the discharge of sewerage into the waters of the State. Their fish laws prohibit the discharge into State waters of substances deleterious, destructive and poisonous to fish, unless it be shown that every reasonable and practical means has been used to abate and prevent pollution.

The Board has formulated a comprehensive plan for the sanitary and prudent utilization of the water resources of the State.

It has already made a survey to determine the extent of pollution, so as to make a classification of the waters of the State.

It has cooperated with the industries of the State to find a solution for the disposition of industrial wastes, and has carried on a great deal of research and experimental work along these lines.

The Boars aims to secure the treatment to the proper degree of all sewerage, which when discharged onto the waters of the State create a menace to any source of public water supply, or a nuisance, or other harmful pollution of the waters of the State, and seem to have the situation well in hand. (See Report of Board to Governor)

New York gives its health department and Conservation Commission jurisdiction over sewerage, and prohibits pollution injurious to public health, fish or oysters.

New Jersey prohibits pollution injurious to health, comfor or property of inhabitants, or the discharge of material injuious to fish.

In some instances where interstate waters are involved, the several states concerned are jointly taking steps by agreements, to control the situation.

In some States Conservancy Districts have been created for the purpose of permitting a unified control of pollution of an entire river system. (See Fox River Conservancy District)

In most of our New England States it is the public health aspect of the pollution problem that has aroused sufficient public interest to find expression in legislation.

New Hampshire prohibits pollution of water supplies. The Board of Health has jurisdiction over water supplies and sewerage.

Vermont Pollution injurious to health is prohibited.

Massachusetts Department of health is empowered to prevent pollution of streams or waterways used as a source of water supply. The Fish Commission may stop pollution injurious to fish.

1915 chap 174 Sawdust Laws.

Maine:

Revisted Statutes, Chapter 130, Sec. 1, as amended by Chapter 126 on the Public Laws of 1917, provided " - - - - "

The scope of this statute in relation to pollution is not known, as it has been before the court but once - State vs Blaisdell, 118 Me. P. 13 - in a case charging defilement of a spring.

In 1917 - Chapter 98 Pub. Laws of 1917 - the Legislature passed an act entitled " An Act to Prevent the Sources of Domestic Water Supply from becoming Polluted "

This act places upon the Public Utility Commission the duty of consulting and advising with municipal authorities and manufacturing interests as to the best methods of disposing of their drainage or sewerage. It also gives the Commission, subject to appeal to the S. J. Court, jurisdiction to investigate

upon petition, complaints relative to pollution of water supplies, and order the pollution abated. It also provides that unless the Commission determines that public health will not be injured, no sewerage or polluting matter shall be discharged into a pond or stream used as a source of water supply. This latter section does not apply to the Kennebec, Penobscot, Androscoggin or Saco rivers.

Aside from these Acts aiming to prevent the pollution of public water supplies, Maine has no general stream pollution laws.

3. Industries' Efforts for Stream Purification.

Many industries are vitally interested in the question of stream pollution, as an abundent supply of pure water is a necessity in their manufacturing processes. Manufacturies have in recent years found it possible to reclaim much of their waste material as valuable by-products that they had heretofore been dumping promiscuously into the streams.

For these reasons industry has for years been giving some of its best thought to this problem, carrying on much research and experimental work at considerable expense.

One of the leaders in this movement is the great pulp and paper industry. Careful estimates indicate that more than $2,000,000 has been spent by the paper industry in the last ten years for research in the saving of waste. One company alone in Wisconsin has expended $300,000 in the last five years.

Early in 1926 the American Pulp and Paper Association created the National Stream Purification Committee for the Pulp & Paper Industry, consisting of the chief sanitary engineers of Pa., Ohio, Maryland, Wisconsin and Michigan, the Secretary of the Technical Asso. of the P. & P. Industry, two mill representatives each from Pa., Ohio, Wisconsin and Michigan, and one each from Maine and Mass. Mr. S. B. Copeland of the Eastern Mnfg. Co., is the Maine representative.

This Committee commenced to function in June of 1926 - (See Minutes of First Meeting)

It is believed this is the first instance of a group of State agencies and representatives of an industry cooperating on a national scale for the solution of problems of waste disposal in the interest of conservation of water resources for the benefit of the nation.

In Nov. of 1926 the Sanitary Water Board of Pa., held a conference with representatives of 19 of the Pulp and Paper Companies of that State. A cooperative agreement between the Board and the Industry was adopted providing for research investigations for the treatment and disposal of pulp and paper mill wastes.

Other great industries such as the tanning industry, the coal industry, and dairy industry are working on the problem of reclaiming or treating their wastes.

4. Results.

The anti-pollution campaign has been gaining tremendous momentum in the last few years, and is everywhere getting results. Millions have been spent by our larger cities in sewerage treatment plants, and many extensive programes are in process of completion.

The Sanitary District of Chicago is engaged with a $65,000,000 program of construction to free the Desplains and Illinois Rivers of their burden of Chicago sewerage.

Milwaukee, to protect its water supply, is operating the largest activated sludge sewerage treatment plant in the world.

Grand Rapids is building a $5,000,000 disposal plant.

In Michigan 14 cities have recently passed resolutions pledging themselves to complete plans for sewerage disposal plants within a period of six months.

The Sanitary Water Board of Pa., has since 1923 approved plans for 35 sewerage treatment plants.

In Oregon, the Oregon Anti-Stream Pollution Committee has been formed, and is preparing a measure to be submitted to the legislature making sewerage treatment mandatory.

Illinois has recently passed a law authorizing the establishment of Conservancy Districts for the purpose of permitting a unified control of a whole river system, or a portion thereof having a drainage area of 50 square miles. The law provides that whenever then unified control of such an area shall be deemed conducive to the prevention of stream pollution and development, the same may be incorporated as a Conservancy District.

The Conservancy District may build treatment works from the proceeds of bond issues payable out of general taxation spread over all the assessable property within the district. The trustees have power to go into a city or village, build a disposal plant, and assess the amount against property owners.

Under this Act the Fox River Conservancy District has been formed embracing a territory one mile wide on either side of the River from the mouth at Ottawa to the Wisconsin line.

Elgin, within the District has recently sold a $700,000 bond issue for a treatment works, and Aurora is contemplating a million dollar plant.

Insert to end

MAINE'S FUTURE POLICY

With the many horrible examples in near by states of the results of unrestricted pollution, not to mention the conditions of our own principal rivers, it behooves the State of Maine, both as a safeguard of its public health and for the preservation of its wonderful lakes and streams in their natural purity and beauty so that they may still appeal to lovers of nature and those in pursuit of recreation - one of its greatest assets in attracting the much desired tourist and summer visitor - to at once take active and vigorous steps to stop this menace in its comparative infancy.

It will be a much easier task to prevent pollution in the first instance than to reclaim streams already polluted, upon which municipalities and industries have come to depnnd for a disposition of their sewerage - and at some time in the not far distant future that condition will surely confront us. Engineers studying conditions on the Illinois River tell us that the longer pollution is permitted, the longer it takes a river to re - cover from it. It appears that the pollution deposits a slime or a silt on the bottom, and that this silt is full of chemical action for years, releasing gases which are destructive to plant and fish life. It is estimated that if pollution were stopped in the Illinois River to day, it would take fifteen years before fish life would be generally resumed because of the gaseous action.

What should this policy be, and what can be done towards beginning a comprehensive plan that will effectively cope with the problem.

POLICY

Any policy should be predicated upon a realization of the fact that these waterways are here for us to use, and that we want to so use them that they will furnish the greatest good to the greatest number, and serve all the public interests of the State and of its people.

When we consider the uses of our waterways, we at once realize that they are being used by many conflicting interest - the nature lover and sportsman would like all streams maintained in a condition of pristine purity; water works operators would like the water they use to be free from contamination so as to reduce the expense of purification; some municipalities and manufacturers would like to discharge all their waste without the expense of treatment of any kind; navigation interests are principally concerned with shoaling and acids.

We would find it economically unsound to maintain all of our streams in a condition of their original purity - we should rather recognize, in the interest of proper economy, that the natural powers of streams to inoffensively assimilate and dispose of polluting matter by dilution, must be utilized. Much more good can be accomplished with our limited means in the treatment only of the pollution load in excess of what a stream can assimilate, than in complete treatment of all sewerage that enters it. We must define what is pure water, and what is sound

conservation as aplied to the use of water, in the light of the best public interests.

Our municipalites have many demands upon their funds, as well as constitutional debt limits, which would make it difficult to finance immediate construction of treatment plants. This fact must be given due consideration.

Our industries established along our streams represent a capital investment of vast sums, and furnish a livelyhood to many of our citizens. They are essential to our prosperity and progress, and must not be hampered with drastic legislation that will put them at a disadvantage in competition with industries of other States. What constitutes the highest and most economic use of a waterway is a problem the solution of which involes a study of local conditions, and the proper adjustment of the various conflicting interests of the locality.

Our policy should rather be one of cooperation with our municipalities and industries in an effort to jointly work out this problem for the best interest of all concerned.

PLAN

1. Sanitary Water Board.

The creation of a Sanitary Water Board along the lines of the Pennsylvania Board. This Board in its membership should reflect such interests as Public Health, Fishing and Recreation, and Industry.

Our laws, both present and necessary future additions, relative to sewerage and pollution, should be administered by this Board. The Board should be able to utilize existing State Depart-

ments wherever they could be advantageously employed for work within their scope - the Department of Health and its laboratories; the Attorney'General's Department; the Fish and Game Department, with its Warden service

The Board should have such appropriation as will enable it, in addition to its administrative duties, to carry on in conjunction with our industries research and experimental work in the best disposition of industrial wastes, and to collect and disseminate all available knowledge on this subject.

Discharge of sewerage, either domestic or industrial, into certain of our waters should be permitted only after issuance of approval permits by the Board, which should have authority to stipulate conditions of such discharge.

2. Classification of Waterways.

One of the first thing necessary for any intelligent understanding of our problem, is a survey of our streams to determine what waters are at present unpolluted from artificial sources, and the extent and character of the pollution and uses of others.

With this knowledge, we will be able to make a classificarion of the waters of the State with reference to their present state of pollution:

Class A. streams would include those in a natural state, unpolluted from any artificial source.

Class B. streams would include those more or less polluted, where the extent of regulation, control or elimination of pollution will be determined by a consideration of the present and probable future use and condition of the stream, the prec-

ticability of remedial measures for abatement of pollution, the general interest of the public, and the economies of each particular case.

Class C. streams would include those waters that are now most highly polluted, and which from a standpoint of the best public interests and practicability, it is not now necessary to restore to a clean condition, or to prohibit the discharge of sewerage or industrial wastes so long as no public nuisance or menace to health is thereby created.

Our policy should be to safeguard the Class A. streams of Maine so that they may be available as sources of water supply, and for fishing and other recreational purposes.

Our policy with reference to class B. streams should be to reclaim them so far as it is practical and economically possible considering the best public interests in each instance.

Our four large rivers - Kennebec, Penobscot, Androscoggin and Saco - should probably be placed for the present in Class C. The greater part of our population and industries lie along these rivers, and it is a serious question as just what would be the best use of these waters for the greateast public good. Again our Class A. and B. streams will require all of our attention, efforts and money within the next few years. However, none of our streams are hopeless. Our large rivers have so much volume that the amount of sewerage is at present probably not excessive - it is rather the character of the waste that is causing troublesome conditions. With increased knowledge of the possibilities of profitable reclaiming industrial wastes that

will result from the extensive research and experimental work everywhere going on, it may be possible for us to do much in the coming years to improve these rivers without placing to great a load upon our municipalites and industries using them.

The adoption of such a policy and plan as above described will call a peremptory halt on pollution, saving many of our streams from its devastating blight, and let us use our entire efforts to recovering, so far as practical, that which is lost.