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H. R. HEYDON, *Editor.*

'NEW JERSEY'

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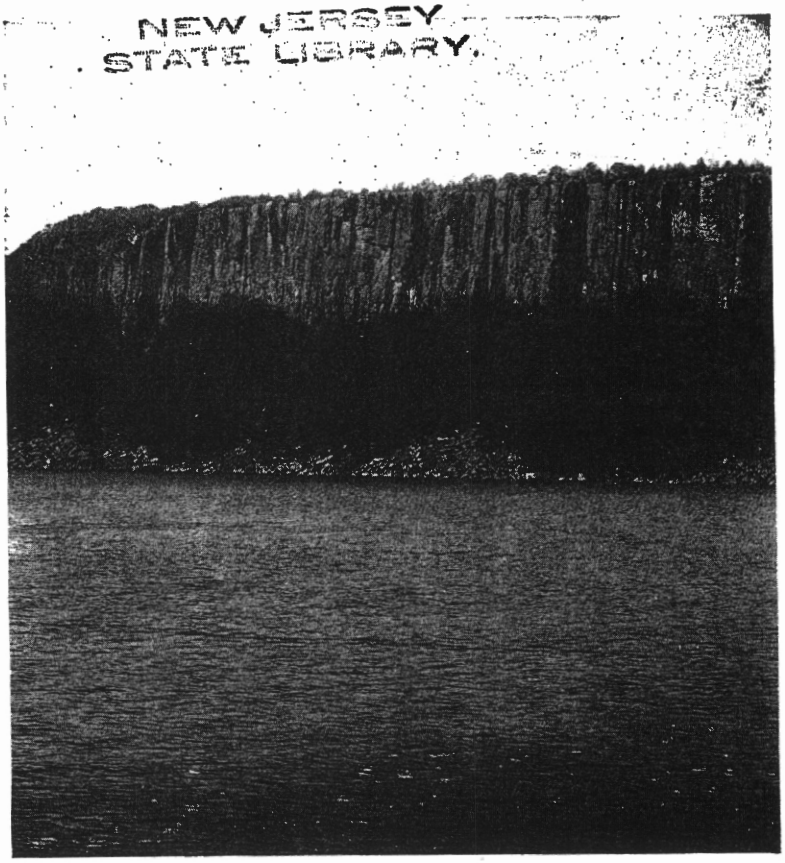
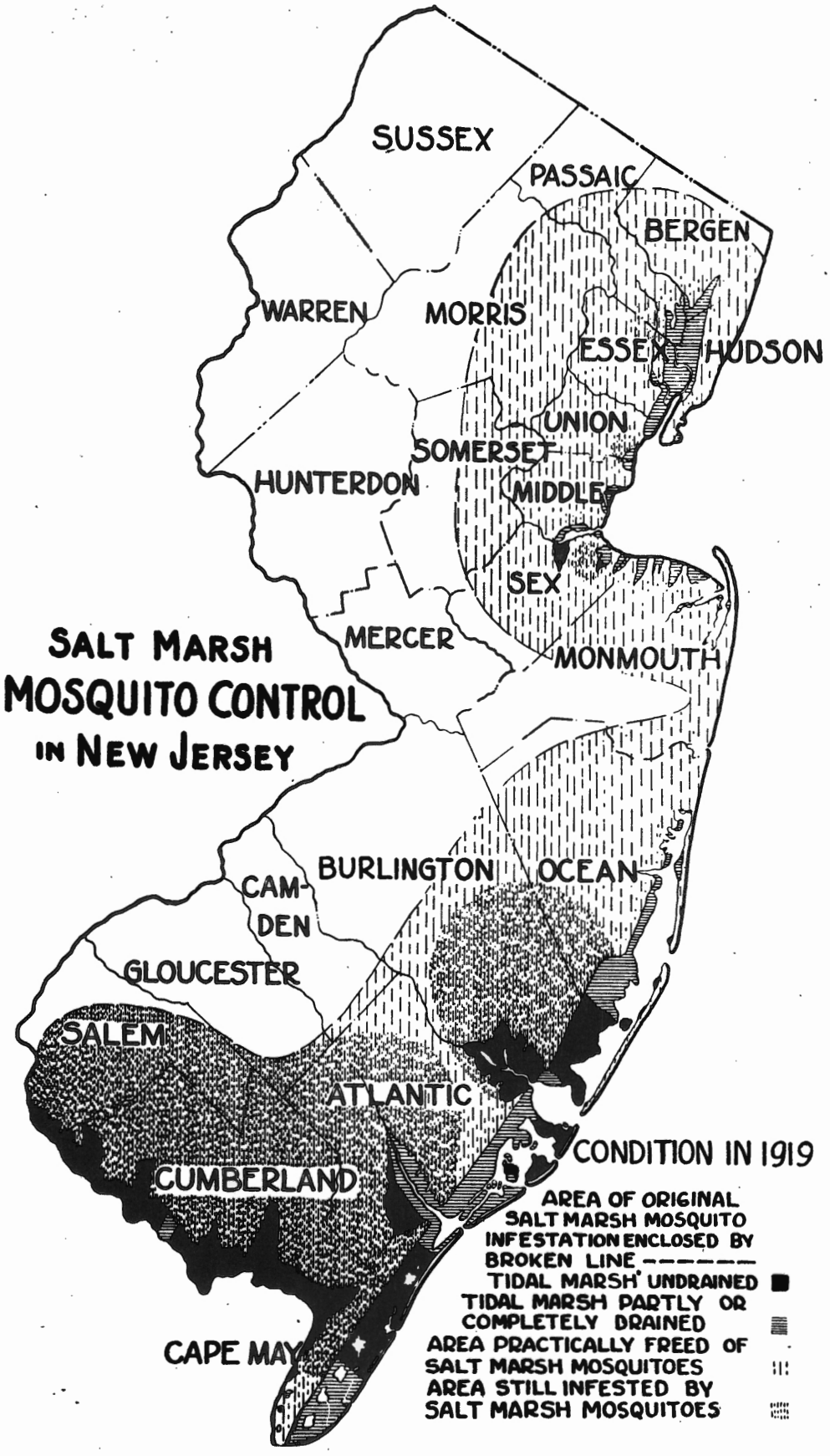


The Palisades

'NEW JERSEY'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TIDAL MARSH UNDRAINED
TIDAL MARSH PARTLY OR COMPLETELY DRAINED
AREA PRACTICALLY FREED OF SALT MARSH MOSQUITOES
AREA STILL INFESTED BY SALT MARSH MOSQUITOES
CAPE MAY

New Jersey Farmers Live Comfortably While Making a Living

'NEW JERSEY.'

ALFRED GASKILL, Director, Department of Conservation and Development

For years Jerseymen have been content with the State's growth in population and wealth, and truly that growth has been most notable, and its rate greater than that of any other State of the older group. Yet it is a fact that seventy-five per cent of our population lives upon six per cent of our territory; that two million acres (45% of the whole area) are still in forest, or the remnants of forest; that one-eighth of all the land in the State is unassessed for taxation; that barely one-tenth of our shore resort area is occupied; that an insignificant proportion of the available recreation ground in the hill and lake sections is utilized; that a million acres of highly valuable farmland is not farmed at all, or not even cleared of the forest remnant; that the State's riches in minerals and earths of great economic value are little recognized. With the most advantageous position in the Union, and with the third highest population density, knowledge of our State, by its citizens, as well as by outsiders, is practically limited to the districts tributary to New York and Philadelphia and to certain sections of the seacoast.

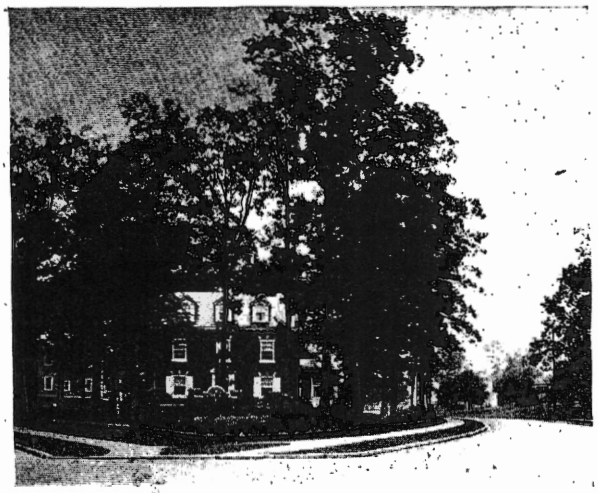
A big WHY? is natural. The answer can be only that the people of New Jersey do not know that, in the language of an old Bavarian saying, "the good God has endowed them above all other people." With faces turned cityward, factoryward, tenement-houseward, the great opportunities inherent in our location—our equable climate, our fruitful soils, our forests, earths, and waters, our highly developed railways, highways and waterways, our schools and social attractions, are most strangely overlooked, even by industrial interests.

The deplorable truth is that Jerseymen have suffered their State to be belittled and reviled; have accepted without question every assertion that our soils are sterile and productive only of scrub oaks and forest fires; have fostered, rather than combatted, the tendency towards industrialism at the cost of a rational, balanced development. Jersey's location gives her a leading place in organized industry—she cannot escape that if she would. But she should not escape it; her fault is that her industries are too greatly centralized, that the advantages of location, transport, labor to be found outside the recognized centers have not been made apparent; above all, that provision has not been made to fill the months that energize the working hands. Violence is done to a fundamental law when a State fails to provide necessities for its own people and becomes dependent upon its neighbors. Further violence is done when any part of the territory of a State, capable of satisfying the needs of its citizens, is abandoned to waste and unfruitfulness.

That New Jersey is too small to provide all the food that is required by her people is no argument for her failure to produce the utmost. She now produces about 150 million dollars' worth of food a year; she can easily deliver four times as much. With all her natural advantages the State should be and can be the greatest center of industry, of pleasure, of food production, of happy homes, upon the continent.

We are not yet badly off of course, and there are many signs of improvement, yet it is almost certain that our development is in spite of, rather than because of, our own efforts. That is, that nature and events work harder for us than we work for ourselves. The war gave some impetus to a movement toward the occupation of a few of the more favored locations outside the recognized industrial centers, as along the lower Delaware and the larger coast rivers; yet the territory available is scarcely touched.

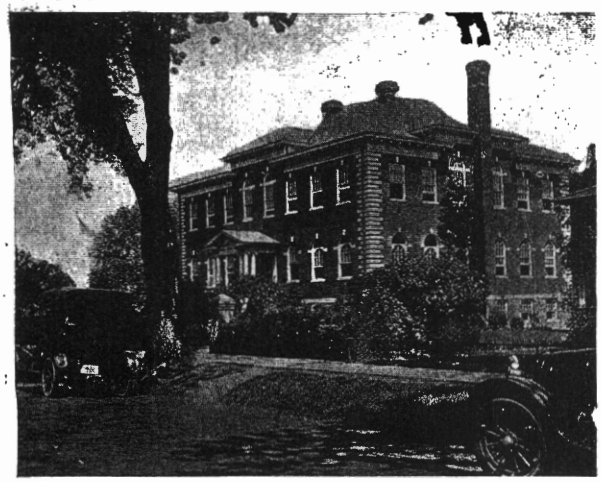
In agriculture the outlook is distinctly hopeful. Under the



Suburban Life Is Widely Enjoyed by All Classes

stimulus of a belated State effort, and abnormally high prices for Western farmlands, a positive and promising movement toward New Jersey farms is under way. If properly fostered and supported the people of the State can confidently expect to be better supplied than they ever have been with food of every kind produced near home, of the highest quality, and at the most reasonable prices.

In similar manner a tide toward the shore resorts is rising; yet that most significantly is localized at a few points like Atlantic City and Asbury Park. The whole 125 miles of seacoast is by nature the Nation's ocean playground. Why is its development so slow?



City or Country Children Are Assured of a Good Education

And is there something that burdens the whole State and its people, as well as the ocean side? When this is queried there comes a pause and one word—*mosquitoes.* They are our heritage, along with our seacoast and waterways. And though Jersey actually has no more mosquitoes than plenty of other localities, our repute suffers the country over because more strangers are annoyed by them than in any other state, and more natives find it impossible to run away from them.

The day for considering mosquitoes a joke is past. They are a nuisance to be got rid of. Even the disease-bearing forms, of which we have relatively few, have been cleared from important regions like the Panama Canal Zone, the City of Havana, and numerous industrial towns in the southern States. Many communities in New Jersey have been practically freed of the pest, with truly wonderful results in increased property values as well as in comfort.

To rid completely our territory of the far-flying salt marsh mosquitoes, the source of nine-tenths of the trouble, has be-

Ideal Conditions for Grazing

come merely a matter of determination and a very moderate amount of money. The means have been proved and approved. Can the people of New Jersey make a better investment than to provide $150,000 a year for five years, speed up the work that eleven county mosquito commissions are doing so successfully, and give the State a chance to assume its rightful place in industry, in agriculture, in recreation, in all-round well-being?

This collection of papers, prepared with the assistance of the Department of Conservation and Development, is offered that Jerseymen may learn to know their State, to value it, and to bring to recognition its many undeveloped resources.

PUBLICATION NOTICE

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, etc., of 'NEW JERSEY,' published monthly at Newark, New Jersey, October 1, 1919, required by the Act of August 24, 1912.

Editor, Howard R. Heydon, Newark; Managing Editor, None; Business Manager, None. Publisher, *Investors' League of the New Jersey State Chamber of Commerce, Clinton Building, Newark, New Jersey.*

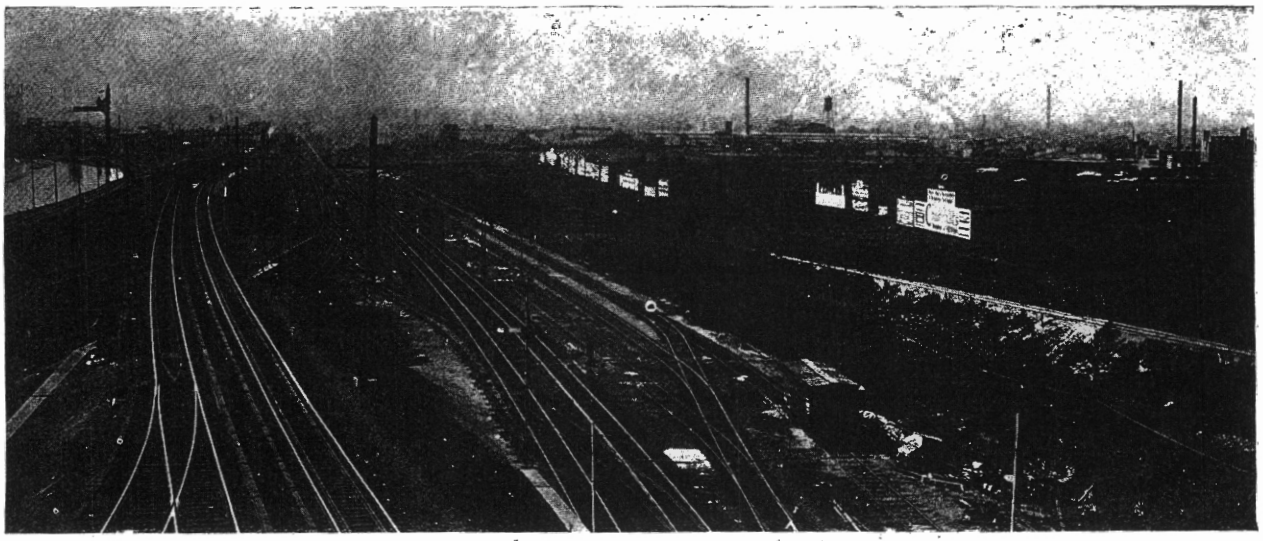
Owners: (If a corporation, give its name and the names and addresses of stockholders holding 1 per cent. or more of total amount of stock. If not a corporation, give names and addresses of individual owners.) *The New Jersey State Chamber of Commerce is a New Jersey corporation, organised not for profit. President, Charles D. Freeman, Iselin; Weller H. Noyes, Tenafly, Vice-President; John W. Herbert, Helmetta, Vice-President; Robert D. Kent, Passaic, Treasurer; H. R. Heydon, Newark, Secretary.*

There are no stockholders. Known bondholders, mortgagees, and other security holders, holding 1 per cent. or more of total amount of bonds, mortgages, or other securities: (If there are none, so state.) *None.*

HOWARD R. HEYDON, *Editor.*

Sworn to and subscribed before me this 11th day of October, 1919.

ELIZABETH B. FISCH,
Notary Public, Essex County, New Jersey.
(My commission expires September 23, 1923.)



Within Seeing Distance of Newark and New York 95% of the Meadows Await Industrial Development

Industrial Opportunities.

J. G. GILLAM.

The exceptionally favorable geographical position of New Jersey, with unsurpassable transportation facilities, accounts very largely for its industrial prominence. Other powerful factors favoring its development are: the proximity to the anthracite coal fields of Pennsylvania, from which manufacturers, at comparatively low cost, can draw their fuel supply; the position between the great financial and commercial centers of New York City on the East and Philadelphia on the West; the Eastern water front of the State on the Hudson River, New York Bay, Staten Island Sound and Raritan Bay, offering abundant wharfage and shipping facilities, the shores of which waters are largely occupied by manufacturing plants that can take advantage of water transportation; the great trunk lines of railroad traversing New Jersey converging at Jersey City, Hoboken and Weehawken, from which merchandise of all kinds may be shipped to and received from any port in the world by water and to or from any part of the American continent by rail.

Where New Jersey Stands. New Jersey ranks sixth in the value of its annual product of manufactured goods and *second* in the per capita value of manufactured goods. The capital invested in the State is nearly twice as much as was invested in the whole United States in 1850. The variety of manufactures is greater than in any other State, and the mills, shipyards and industrial plants, in proportion to its area, are more numerous. With 406 inhabitants per square mile of land area it is the third most densely populated State and it is estimated that 17.7 per cent of the present population are interested as wage earners or proprietors in the vast manufacturing industries.

The mineral resources of the State form the basis of important industries. The iron and zinc mines in the northern counties yield annually one to one and one-half million tons of ore. The extensive clay deposits of Middlesex and other counties are the foundation of an industry whose manufactured products are known in all parts of the world and are valued at upwards of $21,000,000. Extensive deposits of glass sand in southern New Jersey are utilized in the large glass factories of Millville, Glassboro, Williamstown and adjoining places. Numerous trap rock quarries in the central portions of the State afford an abundance of stone for highway construction, concrete and railway ballast. Belts of cement rock and pure limestone furnish the raw materials used in the annual manufacture of millions of barrels of Portland cement. The use of concrete in place of dressed stone has closed many of the sand stone and granite quarries which formerly furnished desirable grades of building stone, but the resources remain, awaiting the day when a changing style of construction will permit their utilization. In the green sand marl deposits of South Jersey there are vast stores of potash sufficient to supply the farmers of a continent, and only awaiting the perfection of a cheap chemical treatment to render it available for agricultural purposes.

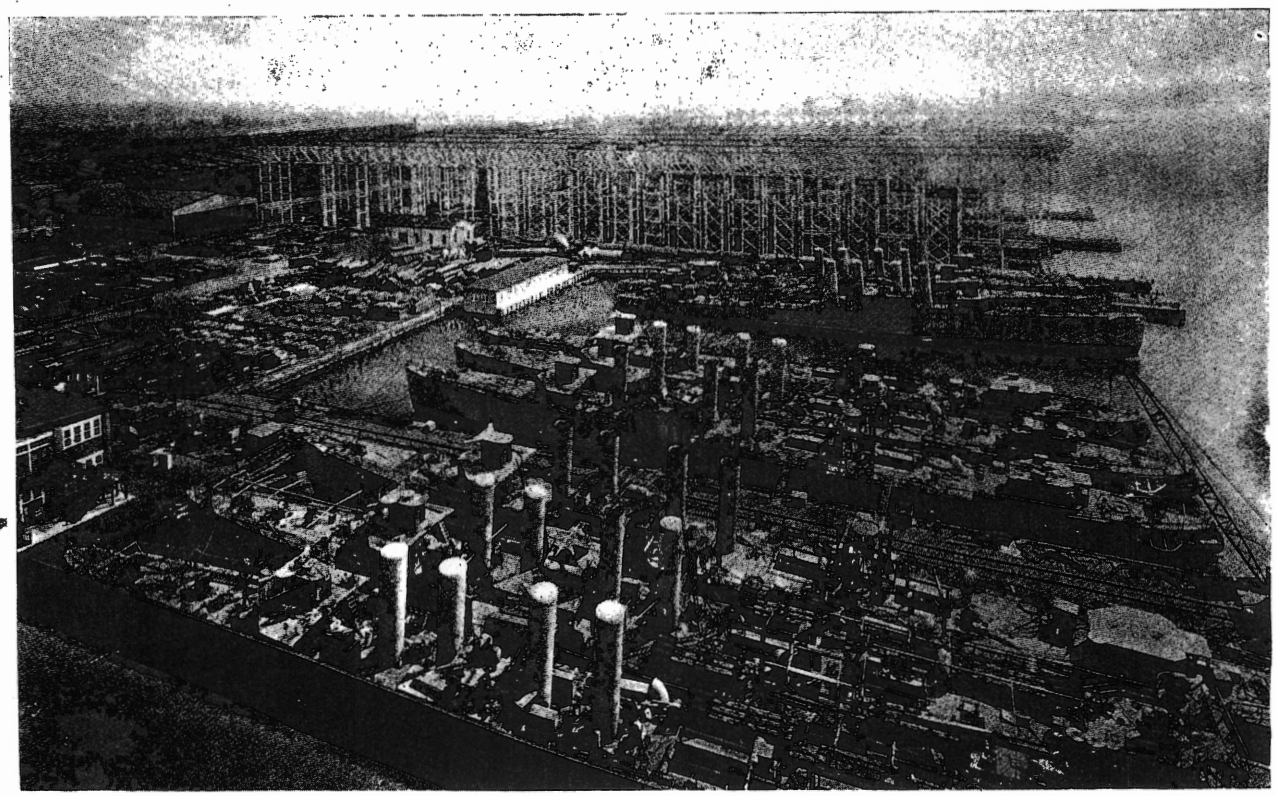
Besides the industries resulting from her natural resources, New Jersey has a greater diverseness of industry than any other State. The State is first in the manufacture of silk goods. More than one-half the total product of silks in America come from the hundreds of mills and dye houses. One dye works represents an investment of $20,000,000 and employs approximately 4,000 men. It also ranks first in smelting and refining copper, refining oil and manufacturing linoleum and sewing machines. It ranks second in the manufacture of chemicals, rubber products, pottery, terra cotta, brick and other clay products, and third and fourth respectively in the production of electrical machinery and supplies, and toilet articles.

Undeveloped Sections Offer Attractions. The industrial advantages in the metropolitan district surrounding New York, Jersey City and Newark are obvious, while scores of smaller towns throughout the State offer the necessary facilities for the establishment of factories and industrial plants. The labor supply problem and the low price of land make the natural advantages in the undeveloped portions of the State most appealing. More and more are new industries recognizing these facts. During the last five years many shipbuilding companies and manufacturers of munitions and essential materials have erected extensive plants in the outlying districts. For example, the dye industry in South Jersey has established a new village, which has accommodations for nearly 2,000 families with community houses, clubs, libraries, theatres and other social and recreational facilities.

Living Conditions Ideal. Good schools, excellent water, churches of all denominations and in fact everything that goes to make up happy home life are found in all parts of the State. Telephone and daily mail reach every section and transportation is readily furnished by means of an extensive system of railways, trolleys and roads.

Local Assistance Offered. A recent survey of the State showed: 147 cities in which factory sites will be given free of cost for industrial enterprises; 283 places in which new industries will be assisted financially; 345 places in which 50 or more operatives can be secured; 281 places in which water power for industrial purposes may be found and 100 places in which idle factory buildings can be rented or purchased.

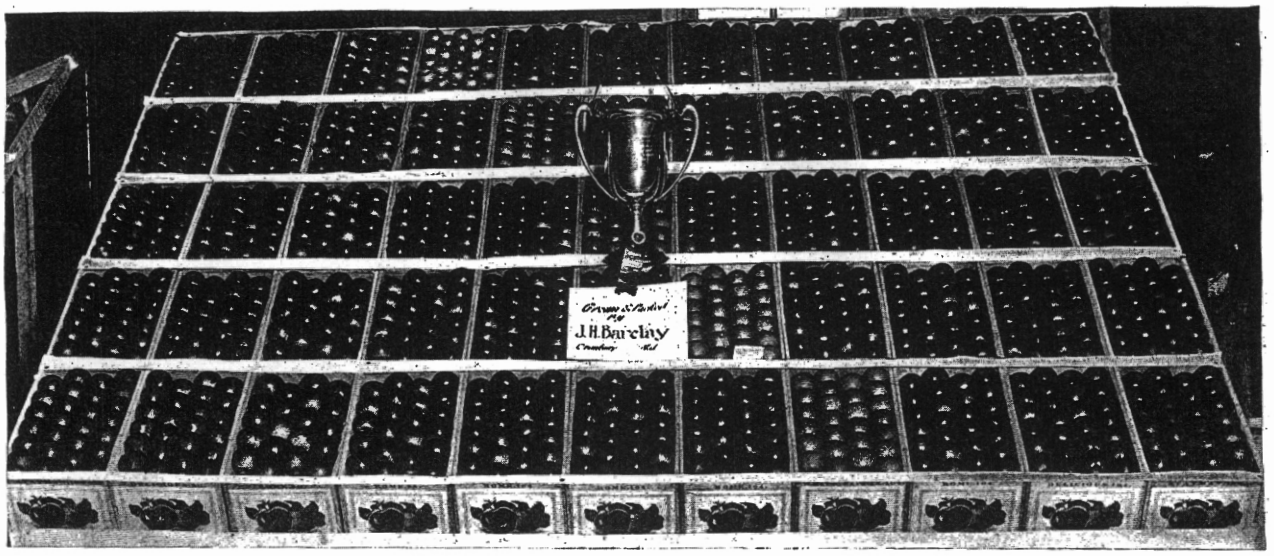
There are 212 towns or cities in the State having Boards of Trade or other forms of business organizations who are ready to assist the right type of industries to locate in New Jersey. With 39 towns situated on navigable waters giving ship transportation to all points, 2,500 route miles of steam railways and a great highway system, and with our geographical position established in the center of the industrial world we offer advantages not excelled by any other section or State.



In War as in Peace the World Is Dependent Upon New Jersey Industries—Destroyers Being Completed at the Shipbuilding Yards in Camden

The services of the New Jersey State Chamber of Commerce are available to assist any person or corporation interested in obtaining information regarding the industrial facilities in the State or any subject referred to in this publication. Inquiries should be sent to H. R. Heydon, Secretary, Clinton Building, Newark.

A Small Section of the Immense Dye Works at Deepwater Point in Salem County



Some Jersey Grown Apples Which Won the State Chamber of Commerce Cup

Agricultural Opportunities.

L. G. GILLAM.

New Jersey has long been known for its truck farms; its advantages for dairying, fruit raising, poultry and general farming are less well recognized. Occupying the most advantageous position in the Union, between the two great centers of New York and Philadelphia, and with more than ten million people living within sixty miles of the State House, New Jersey offers a wonderful field to agriculturists. Its unexcelled markets, moderate climate and the ready adaptability of its soils to a wide range of crops, give opportunities for farming such as no other state can offer.

Like others of the older states, New Jersey has passed through a varied agricultural history. Years ago it was noted for its general crops, its beef cattle, its horses, its sheep and its swine. Changing industrial and social conditions, and particularly the development of the middle and farther west, for a time reacted unfavorably on the agricultural industry of the State. Between 1870 and 1900 much of the land formerly under cultivation became idle. Land values decreased and there was much migration to the cities or to other agricultural territories.

Gradually, however, the farmers of New Jersey began to adjust themselves to the changing conditions. They recognized their peculiar advantages as to markets, soil and climate. The remarkable expansion of the nearby cities encouraged

In Some Sections Truck Is Profitably Grown Under Irrigation

A Commercial Poultry Farm

specialization in the production of high-grade commodities. General farming and live stock farming as practiced in the second and third quarters of the nineteenth century no longer permitted the farmers of New Jersey to compete with those in the middle west. On the other hand, the increasing number of discriminating buyers in the large cities of New Jersey and adjoining states encouraged specialization in the production of high-grade milk, of poultry products, of vegetables, fruits and berries. New Jersey was among the first to engage in the production of certified milk. It soon became prominent for its commercial poultry plants. It developed a remarkably progressive type of potato growing in Monmouth, Middlesex and Burlington Counties. It has shown how cranberries may be grown to advantage. For many years sweet potatoes and peaches produced in New Jersey have borne a well deserved reputation for quality. Apple growing is just beginning to strike its stride and promises to become one of the leading industries. The florists of New Jersey are easily among the leaders in floriculture in the United States. These are but a few of the specialties in which the growers of the State have become proficient. Specialization is certain to continue and the advantages offered by New Jersey as an agricultural state will increase rather than decrease.

Where New Jersey Stands To-day. The State census of 1915 returned a total of 2,844,342 inhabitants, a gain of 307,175 or 12 per cent since the Federal census of 1910 was taken. The property assessment for 1918 gave a total of $3,030,926,010. The total annual value of the State's agricultural products is estimated at $150,000,000, which, coming from slightly over 1,000,000 acres of cultivated land, gives the exceedingly high average of about $150 an acre. In proportion to its area New Jersey leads all states east of the Mississippi River in acreage and total production of alfalfa. On the same basis it leads all states in poultry production. Three of its counties are among the five largest producing sweet potato counties in the United States, and the State holds the dairy record for the highest county production per cow. New Jersey's asparagus crop is the second largest in the country. It raises more than one-half of the pepper crop, and one-third of the cranberry crop. Contrary to the general opinion that the State's agricultural activities are confined mostly to the raising of fruit and truck, it is possible to show that New Jersey produces annually over $25,000,000 worth of dairy products, $17,000,000 worth of corn, $14,000,000 worth of hay and $19,000,000 worth of potatoes.

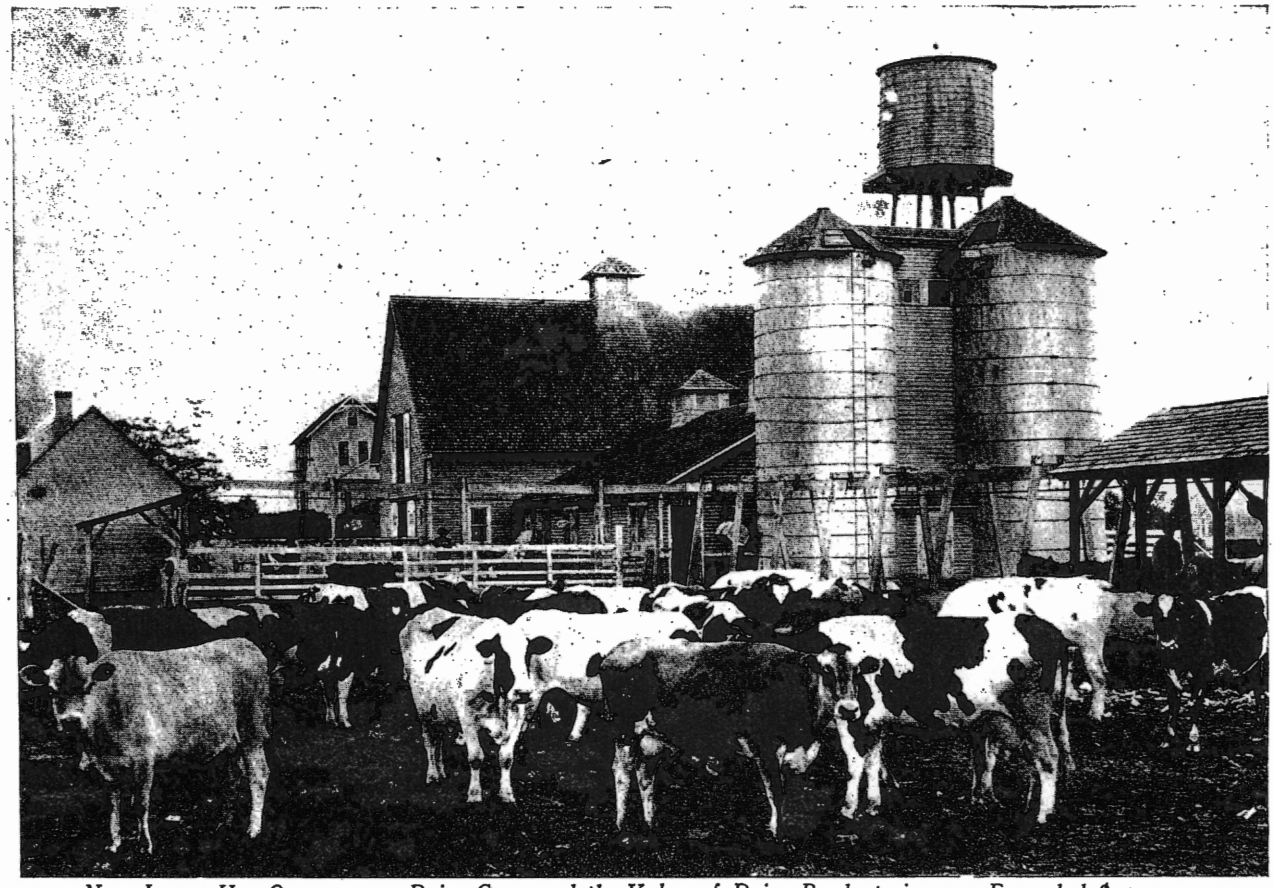
A Field of Corn on Minch Brothers' Farm, Bridgeton, N. J., Grown During Dry Summer of 1914

Apples with Beans—The Double Cropping Practice Is Common

Plenty of Land. Though many of our farms are yielding high returns, there are now available for immediate and future development a million acres of land quite as good as most of that now in profitable culture. Three hundred and fifty thousand acres of the best grain and fruit land occupy the valleys and hillsides of Hunterdon, Morris, Passaic, Somerset, Sussex and Warren Counties. Six hundred and fifty thousand acres lie in the southern half of the State, where the soil is light and easily worked, and the growing season long.

Cost. New Jersey can offer no public land, but much of that which is available can be purchased for less than the assessments on so-called "free lands" in other states. Uncleared land can be secured for from $5 to $20 an acre; cleared land without buildings for $20 an acre; run-down farms with buildings for as little as $50 an acre, while farms

New Jersey, in Proportion to Its Size, Ranks Foremost of All the Potato Producing States—350 Bushels to the Acre Is Not an Uncommon Yield in Some Sections



New Jersey Has Over 150,000 Dairy Cows and the Value of Dairy Products in 1919 Exceeded $25,000,000

in good condition can often be obtained for from $60 to $100 an acre, depending upon location and other conditions. From these low figures, prices range upwards, yet with many opportunities to acquire good farms upon better terms than those that rule in other states. There also are opportunities to rent.

Jersey is Highly Developed. New Jersey is highly organized, and offers attractions not in the future but now. Yet there is plenty of room for expansion. Every farming section is in closest touch with city populations and consuming centers, so that nowhere need the farmer live in isolation. There are practically no farms in New Jersey more than three hours away from New York or Philadelphia. Few farms are more than two miles from an improved highway or more than four miles from a railroad station. Stores are always near and telephone and daily mail reach every section.

Schools, Banks and Social Advantages. New Jersey's schools are among the best in the Union. Graded schools are provided for farmers' children, as well as for those who live in town. High schools are always within reach, while three universities provide for higher education. An agricultural college is at the service of those who wish to qualify as modern farmers.

Every community has at least one bank, organized and administered under Federal or State control, and various co-operative associations, all designed to meet the financial needs of the people. No farmer's family need be out of touch with religious or social life. Churches of every denomination abound and are easily reached by means of our good roads.

Many Helping Agencies. New Jersey has unrivaled sources of information for the farmer. The Agricultural Experiment Station, the Agricultural Extension Service of the State University, and the State Department of Agriculture are always ready to give advice and assistance of a thoroughly practical kind. A Superintendent of Farm Demonstration, located in

Peas and Vines Delivered to Cannery for Mechanical Separation

each County, is the representative of the Extension Service of the State University to help with local soil and farm problems. Co-operative farm organizations are abundant and the community spirit in the rural districts has been developed.

Climate and Soils. Climatic conditions are moderate and do not vary greatly throughout the State. The rainfall is exceptionally uniform, the average monthly precipitation being close to four inches. There is always plenty of water everywhere for agricultural purposes.

Neither heavy snowstorms nor extended cold periods are frequent; the winters in the southern sections especially are often mild and with but little snow. Destructive winds are practically unknown. New Jersey soils present great variation in texture, composition, water-holding power and productiveness. This fact determines to a large extent the particular crops grown, and permits the carrying on of many diversified types of farming. Detailed soil surveys of the whole State are nearly completed and maps and descriptions of several sections are already available.

Market Facilities. Farmers in New Jersey do not have the difficult marketing problems encountered by producers in the Western and Southern states. New York on one side and Philadelphia on the other are within one hundred miles of any farm in the State, yet New Jersey at present supplies but a small percentage of their needs. The manufacturing cities, the country towns and villages and the rapidly growing seashore resorts within the State likewise furnish markets for a large part of the farm products now grown in the State. Twenty-five hundred miles of steam railways, a great system of highways, consisting of fifteen thousand miles of rural roads and deep water ship transportation on three sides, give our farmers market connections surpassed by those of no other territory in the world.

Farming Opportunities in all Sections. It is recognized that Northern New Jersey, with its irregular topography, its fertile valleys and its splendid water supply, is peculiarly fitted for live stock farming, particularly dairying and sheep raising, and also for the growing of apples and peaches. Portions of the valley lands, rich in humus, are being developed for the production of certain forage and truck crops. In central New Jersey potatoes, tomatoes, fruit, alfalfa and corn are among the prominent crops. Southern New Jersey, with a large area of sandy loam soils, specializes in the growing of early vegetables, of sweet potatoes, peaches, apples and berries. Cranberries are one of the important special crops and poultry farming is offered peculiar advantages of soil and climate.

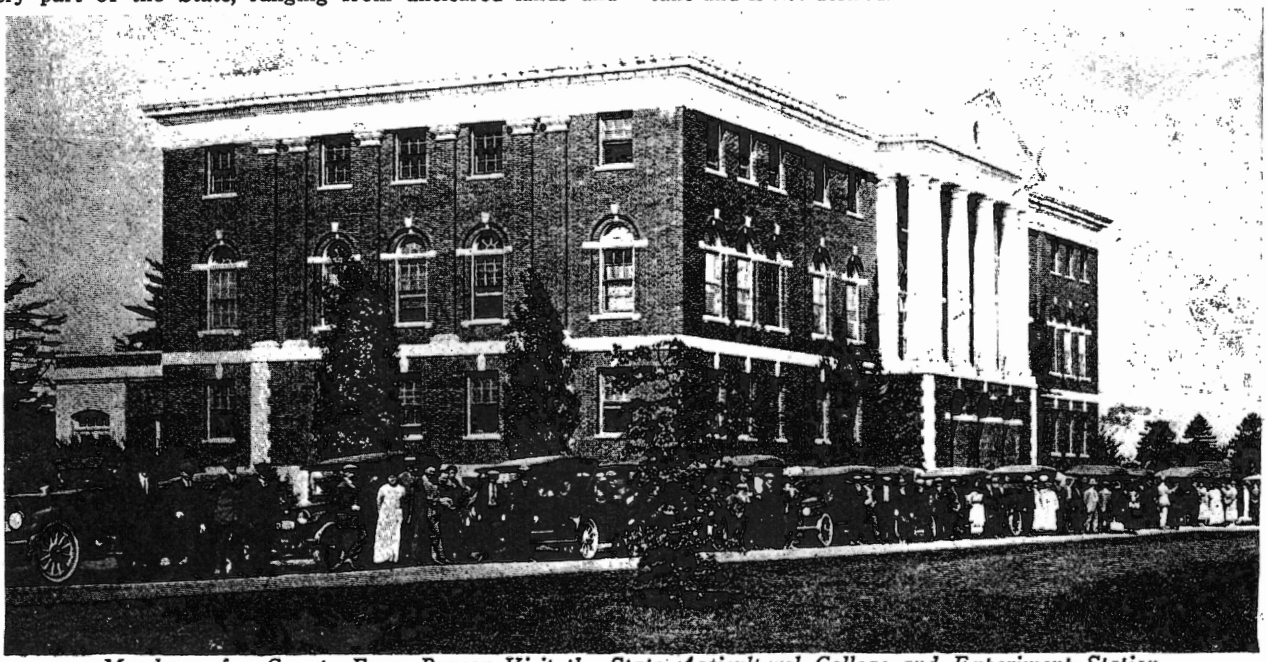
Reliable Information Offered. New Jersey's repute has suffered not a little through the ill-advised, sometimes conscienceless, efforts of boomers who, with no knowledge of the diversity of our soils, and with no knowledge of, or interest in, the requirements for successful farming, have advertised tracts of land for farming enterprises, especially fruit and poultry raising, in a way that has brought disappointment to many. The State and its official agencies stand for none of these efforts. No attempt is made to attract farmers, or families, who hope to find an easy living on the land. Our appeal is made to those who seek opportunity to practice, and to develop, their skill as farmers under agreeable living conditions, and where success may be assured through honest work, intelligently directed.

In order that prospective settlers attracted to New Jersey may not be misled, a Land Registry Bureau has been estab-

New Jersey Central Freight Yard at Freehold Receiving Thousands of Bushels of Potatoes for Daily Shipment to All Parts of the Country

A Community Market in One of Our Industrial Cities—Fresh Produce for Townspeople—Good Prices for Farmers

lished in the Department of Conservation and Development. It gives, without charge, definite and trustworthy information about farming opportunities and conditions, and assists in securing farms adapted to the inquirer's needs, experience and financial ability. It is in touch with available properties in every part of the State, ranging from uncleared lands and run-down farms to highly developed farms of all sizes and types. Thus it hopes to bring new farmers to the State and to stimulate the taking up of farm lands now apparently neglected, together with land not yet developed, although anything like a boom in farm values would be a positive misfortune and is not desired.

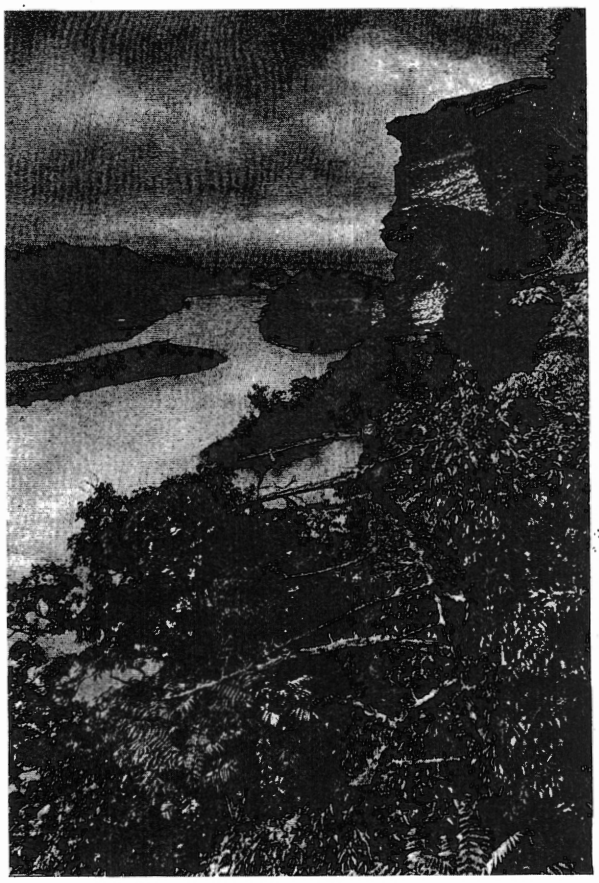


Members of a County Farm Bureau Visit the State Agricultural College and Experiment Station

The People's Playground

EDWARD C. STOVER, JR.

Within Convenient Reach. For the man who seeks diversion from the routine of daily life, New Jersey offers unlimited possibilities. Her wooded mountains and rolling hills in the north, her quiet lakes and flowing streams, her level reaches of sandy shore give a range of natural charms that



The Delaware Valley Is a Paradise for Vacationists

meet every requisite. Their great value as a developing State resource is increased by their accessibility to the enormous nearby populations, which assures a saving in time and money to people who have none too much of either. The resorts of New Jersey already attract more visitors than those of any other state, but this growth has been centered chiefly in a few seashore resorts, which have gained a world-wide reputation, while much territory just as suitable for development, both along the coast and amid the hills and lakes, is used far below its capacity.

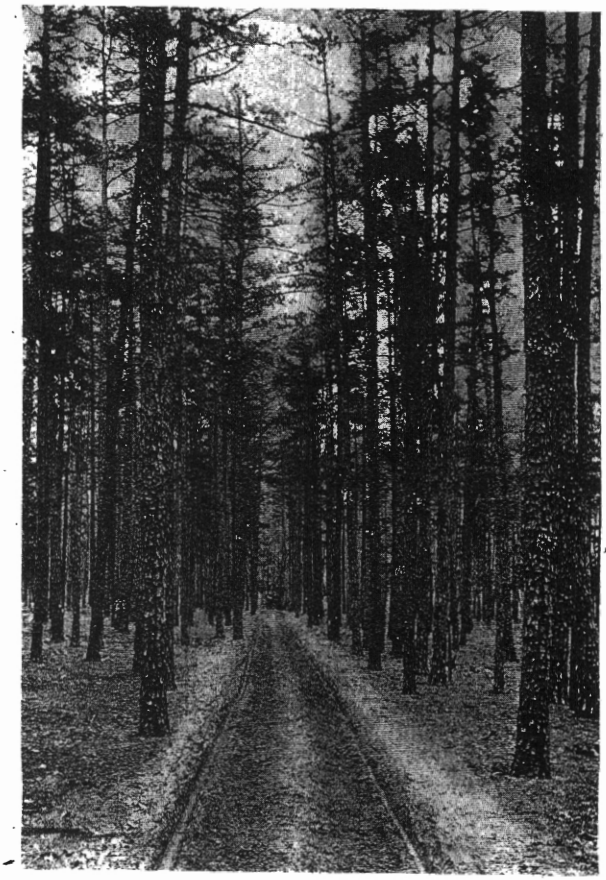
Seashore. The Jersey coast, from Sandy Hook to Cape May, a reach of 125 miles, with its pleasing climate, splendid level bathing beaches, and its many inlets and bays, which afford ideal conditions for sailing and yachting, is the chief summer playground of the country. The surprisingly mild winters, especially in the southern portion, have caused it to become popular as a winter resort, and an increasing number of hotels in the large resorts are remaining open throughout the year. No place is more popular for conventions.

The ratables along the coast, on less than 1% of the State's area, have reached $262,000,000, a large part of which represents capital brought in from without our borders. Of the 160,000 acres of seashore property, not over 33,000 acres, or 14%, have even been divided into building lots, so that when vacant lots are taken into consideration, it is safe to say that only 10% of the land has been developed.

Mountains. Though less well known, the rolling hills and mountains of the northern counties lack none of the charm of the famous mountain resorts in other states. Magnificent vistas are afforded from altitudes up to 1,804 feet, and the seclusiveness of the native forests, with their winding paths and rippling trout streams, may be enjoyed within easy reach of many cities. It is the constant wonder of those who are acquainted with this region, that it has so long escaped recognition. While numerous resorts have been built up, the possibilities for further development are practically unlimited.

State Forests as Public Playgrounds. Camp sites are offered to the public on the 7,000 acres of State Forest along the ridge and western slope of Kittatinny Mountain in Sussex County. Here outdoor life is at its best, having several well-known mountain lake resorts nearby. With the increasing popularity of the area, the Department of Conservation and Development is planning to enlarge this property to include 40,000 acres and create a great State Forest Park, extending for thirty-five miles along the mountain from the Delaware Water Gap to the New York State Line.

Lakes and Streams. Lakes and streams, which add so much to the joy of outdoor life, are found in all parts of the State, but especially in the northern part are they combined with the charm of the woods and mountains. There are exceptional opportunities for development along recreational lines. Lake Hopatcong, Greenwood Lake and several others have become favorite resorts, but many others of equal beauty are now enjoyed by only a few.



The Pines Are Popular in Summer and Winter

The Delaware Valley. A famous artist has said that the Delaware Valley is more picturesque than the Rhine. It is readily accessible by a railroad running up the Jersey side from Trenton, and by a railroad cutting across the State from Jersey City. A great many people spend their summers along the banks of the Delaware, and there is a growing appreciation of its unlimited possibilities as a playground.

Trout Stream in the State Forest on Kittatinny Mountain

Pines. In the pines of Burlington, Monmouth and Ocean counties are several health resorts, attractive in the winter and summer as well. Here also numerous lakes and winding streams contribute to the natural charm. Lakewood, Lakehurst and Browns Mills are well-established resorts and new ones are constantly being developed. They represent one of the many returns to the State in ratables from the development of our forests through fire protection.

An Ideal Home State. In the pursuit of happiness the resident of New Jersey is indeed fortunate, having a wide choice of pastimes when the day's work is done. Through the prosperity of its people the automobile is widely enjoyed. The prevailing good roads and excellent communications in general bring the city amusements within reach of the rural inhabitants, and the beauties and pleasures of the country to the city man. These conditions are causing an increasing number of commuters to build homes in the rural districts, away from the turmoil of the large cities, often bringing in wealth earned outside our borders.

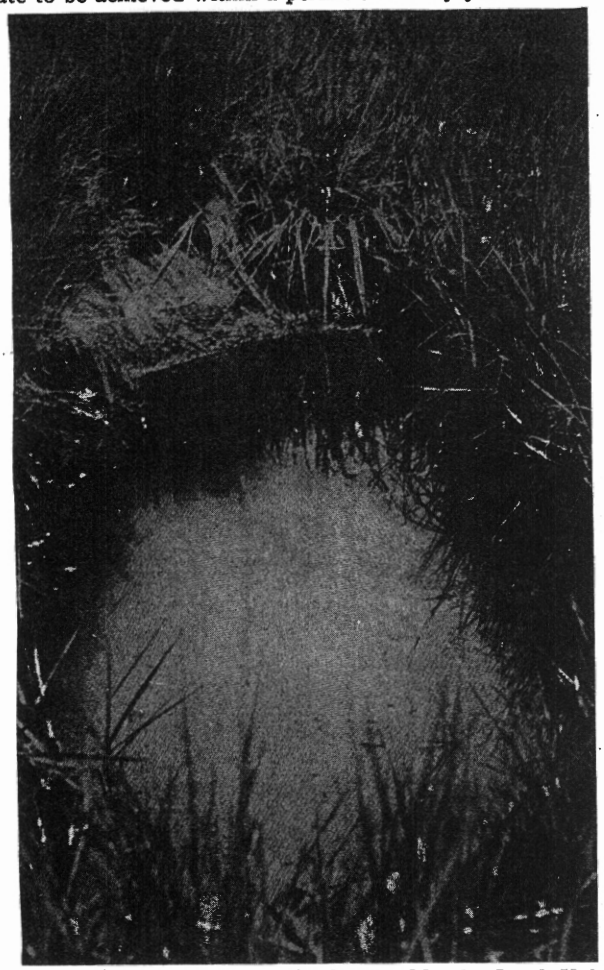
The People's Playground. The State is by natural endowment an ideal recreation ground. The development of these resources as a means of increasing the State's revenue is the opportunity of its citizens. The enjoyment of them is the privilege of everyone, and is limited only by the spare time of the individual.

The Jersey Coast Is Famous Throughout the World

Mosquitoes and State Development

EDWARD C. STOVER, JR.

$500,000,000 Possible Increase in Ratables Within 20 Years. The development of the State is marching to the tune of the salt marsh mosquito. It has been found that over 90% of the insects that trouble us are bred on the 300,000 acres of marsh that lie behind the coastal beaches and border the waterways. By reason of their ability to fly as far as 30 to 40 miles and to produce unbearable discomfort by day as by night among the people within their reach, they have proved, and unless controlled will continue to prove, a most serious retarding influence on the agricultural, seashore, industrial and urban development. The rapid growth along these lines which has followed work already accomplished is an index to future possibilities. Complete suppression of the salt marsh mosquito in New Jersey is practicable and opens the way for an increase of more than $500,000,000 in the taxable values of the State to be achieved within a period of twenty years.



Breeding Pool in an Undrained Salt Marsh—Land Values Are Affected Over 30 Miles Away

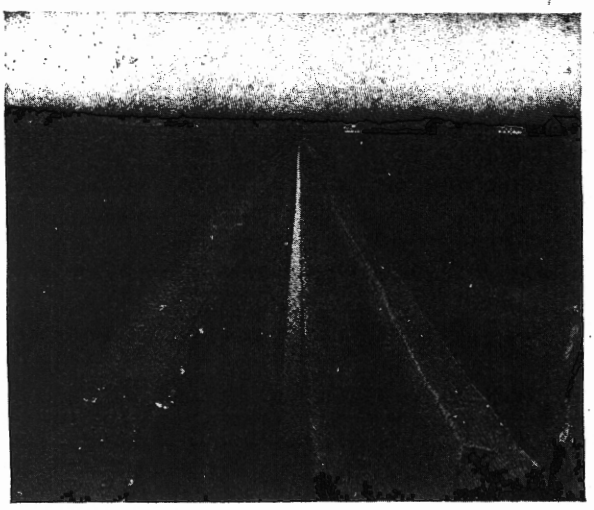
The Agricultural Ratables Can be Increased $100,000,000. A large portion of the State's area is affected by salt marsh mosquitoes. They now greatly hinder the natural movement of capital and population from high-priced farm lands in other states, remote from markets, to low-priced farm lands in New Jersey with nearby markets.

The suppression of the renowned pests would cause a rise in farm values, not only through the accelerated movement toward our fertile soils, but also from the creation of enormous markets through the increased settlement of the coast resort area.

In eight of the counties in South Jersey now most affected by the pests, the average value of improved farm land, of which there are 631,000 acres, was last reported at $56 per

Assisting with Machine Method

Machine Method



Result of Machine Method

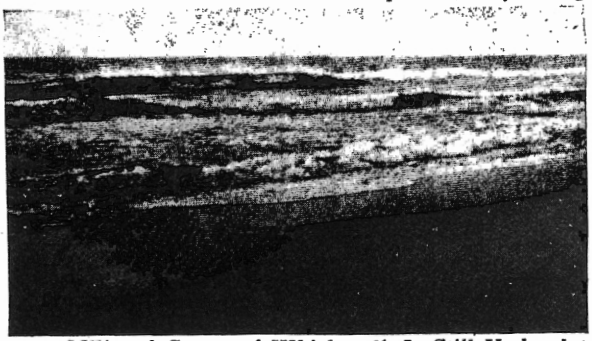
acre. Farmed under suitable conditions, its value should be at least $150 per acre, making an increase of $94 per acre, amounting to a total of $59,000,000.

In these same counties there are 600,000 acres of land not at present classified as farm land, with an average value of not over $20 per acre. If improved and properly utilized, as has already been done around Hammonton and Vineland, it should be worth at least $100 an acre; making an increase of $80 per acre and amounting to a total of $48,000,000.

Assets Along the Coast Can be Raised $200,000,000. The salt marsh mosquito is the chief retarding influence in the development of the coast resorts. Because of the fact that pleasure seekers are able to come and go much as they please, badly infested districts cannot hold patronage from year to year, to which many unsuccessful enterprises stand as a monument, while the fame of the Jersey mosquito has been spread abroad. Being within easy reach of the densest centers of population in the United States, this beach is the natural summer playground for the vacationist, the commuter and especially those who have but few days away from business.

It is reasonable to anticipate that with the chief obstacle to development removed, the increase in ratables will greatly exceed that of the last 20 years, which makes $200,000,000 increase a very conservative estimate. Indeed there is reason to believe that valuations along the Jersey Coast, on less than 1 per cent of the State's area, will ultimately reach $2,500,000,000, a sum almost as large as the present total for ratables of the entire State.

Increase in Industrial Ratables Would Exceed $200,000,000. In the metropolitan district in northern New Jersey, which is one of the richest and most densely populated sections of the entire United States, lies a salt marsh area of more than 28,000 acres on which industrial development has just begun.



The 125 Miles of Coast, of Which 90% Is Still Undeveloped, Is Being Redeemed from the Infestation of of the Salt Marsh Mosquito

A study of the listed taxable values in Essex County during the last 20 years shows a steady rate of increase from year to year, amounting to a gain of nearly $400,000,000. For the same period values on the Newark meadows were at a standstill or on the decrease until 1905, when mosquito control was taken up in earnest. From that time there has been a large percentage of increase each year. The increase in valuation for Essex County from 1905 to 1918 was 166 per cent; the increase in the ratables of the Newark meadows for the same period was 1913 per cent, or more than 11 times the percentage of increase of the county.

With breeding now under control on about 60 per cent of the 28,000 acres of marsh in this district, and with assurance of greater freedom from the pests, capital will no longer be withheld from investment in this most desirable section. Corroboration of this fact, and high commendation of extermination work already accomplished, is found in statements obtained from manufacturers now located on the meadows.

Although only 5 per cent of this meadow land has been occupied, taxable values have risen from $1,000,000 or less to $16,000,000. By complete suppression of the salt marsh mosquito, the acceleration given to industrial development on them and the stimulus which will inevitably be given to industrial and urban development upon the affected upland will undoubtedly raise property values more than $200,000,000 within 20 years.

How Mosquitoes Breed. Mosquitoes breed only on water. The female lays her eggs on the water or on damp soil where water may later come. Some species pass the winter as adults in cellars and other sheltered places, while others, including the salt marsh, winter in the egg or larvae stage at the bottom of pools. In due time they hatch, being hastened by increased temperature. If the larvae are undisturbed for from 7 to 28 days they pupate and in from 1 to 14 days more emerge as full-fledged mosquitoes. A breeding place may yield several crops during a period extending from early spring until the fall frosts. Trees and shrubbery do not produce mosquitoes; they merely shelter them.

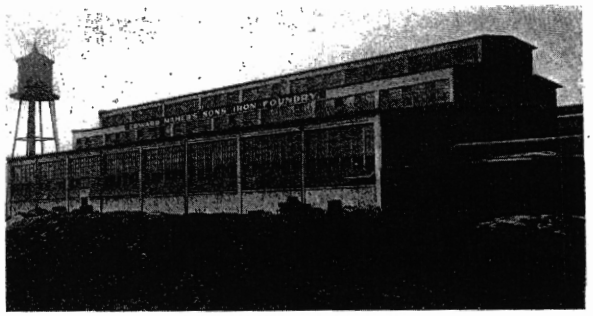
Practical Control. Control of the salt marsh mosquito is a State problem because of the large area affected. Malarial, fresh water and sewage mosquitoes do not fly far from their breeding places and are active chiefly after dark. Their control is exclusively a local problem, as they punish only the communities that permit them to breed.

Control in general depends upon destroying the breeding places and the larvae. Natural forces are being brought to bear in the control of the salt marsh mosquito. For the greater part of our territory a carefully planned series of narrow deep ditches with strong tidal outlets serve to make all parts of a marsh subject to the regular flow of the tides. On the flood, the ditches are filled and become thoroughfares of great numbers of killifish, which eat the developing larvae. On the ebb, the ditches and the marsh are drained and mosquito larvae are destroyed by drying up. Under this alteration a marsh is rapidly freed of mosquitoes. In some cases dikes and pumping must be resorted to, and timely inspections, with the application of oil where needed, make extermination complete. In certain localities where property values warrant the expense, sections of marsh may be filled in, with consequent elimination of mosquito breeding. But the freeing of one marsh, or a marsh here and there, does little good, because these mosquitoes can travel so far. Practically the whole of New Jersey's salt marsh must be ditched or drained before effective relief from the pests will be secured.

Completion Is in Sight. Of the 300,000 acres of salt marsh within the State, about 20 per cent is swept by the tide with sufficient frequency as not to require a drainage system. Subtracting this 20 per cent and the amount that has already been completed, there yet remains an area of about 150,000 acres to be drained.

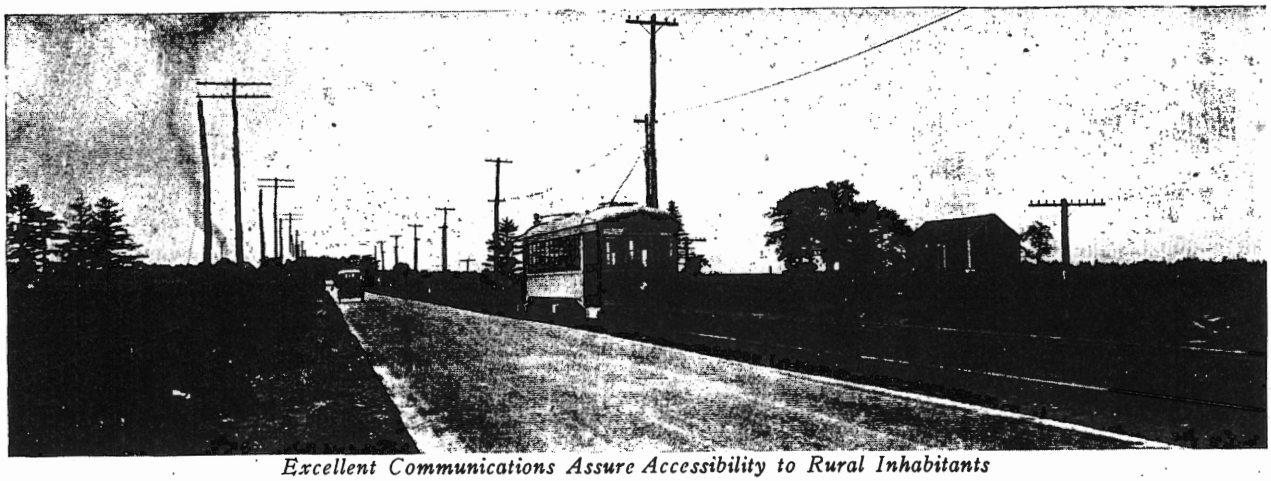
An average of 300 linear feet of unit ditching and spurring is required for one acre, at a cost of from 1 to 3 cents per foot, depending upon conditions. Satisfactory drainage may be done on a large scale for about $6 an acre. At this estimated cost the 150,000 acres may be completed for $900,000.

Proceeding at the present rate of drainage of less than 10,000 acres per year, which is the greatest progress the available funds will permit, it will take 15 years to complete the initial work. Some counties are making great headway, while others with large acreages of salt marsh are unable to provide the necessary money.



As a Result of Suppressing the Mosquito, Industries Are Springing Up on the 28,000 Acres of Meadow Land in the Metropolitan District.

It is possible to complete initial work of ditching within 5 years by an annual State appropriation of $180,000. This would permit the counties to take care of their maintenance and to give greater attention to the control of local species. The plan to rid the State of its salt marsh mosquitoes in 5 years has been endorsed by the State Chamber of Commerce and other representative interests. The support of everyone is invited.



Excellent Communications Assure Accessibility to Rural Inhabitants

Communications

EDWARD C. STOVER, JR.

A Center of Communication. New Jersey is at the heart of the country's system of communications, whose main arteries of traffic radiate from our State in all directions. With one of the principal seaports on either side, the State establishes contact with the United States and the outside world. This favored position is a guarantee of her continued prosperity. No greater recognition of this advantage could be given than the establishment within her borders of so large a percentage of the great industries associated with the recent war.

Within our boundaries is a network of communications, so numerous that the State ranks among the first in the country in transportation facilities per square mile. The high grade roads and steam and electric railroads which radiate across its territory, especially from New York, Philadelphia and between the cities within the State, and connect all centers of population, afford great convenience and advantage to the populus. Bounded on three sides by water, and traversed by several navigable streams, transportation by boat will always be a factor in the development of certain sections. By virtue of these land and waterway facilities for travel and shipping, the State has made rapid strides in community and suburban development, her resorts and industries have prospered and agricultural land will soon be at a premium.

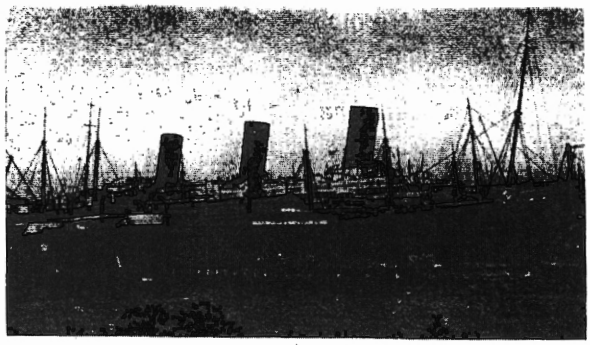
Every Resident of New Jersey Knows the Advantage of Good Railroad Service

Steam Railroads. While railroads have been laid with reference to settlements, they are, when once laid, a very important factor in determining further development. Because of the heavy traffic and satisfactory service over the many trunk lines and branches which cover the State, development along their rights of way has been rapid. This is particularly true in the northern half of the State, while in the southern half, where service is also excellent, the splendid opportunities and advantages which are offered have been to a great extent overlooked.

New Jersey, because of its relatively small area, and its large total of 6,147 track miles of steam railroads, has better service than practically any other State in the union.

Electric Roads. The 1,294 track miles of electric railroads in the State are playing an important part in suburban and rural development, by bringing large areas within easy reach of the centers of population.

Highways. The State has more than 15,000 miles of rural roads, or four-fifths of a mile of hard-surfaced roads for each square mile of area, which is nine times as much as the



The Largest Ships Are Accommodated in the Port of New York—Wharfage Is Available on the Jersey Side.

average for the United States. The State Highway Commission is constructing a State highway system which is well under way, and which with its branches and feeders will involve an expenditure of approximately $70,000,000. Only the best and most durable types of pavement are being laid down. The rapid development of new areas is following the opening of good thoroughfares. Citizens in every section of the State enjoy comfort and economy in travel, and accessibility to markets, shopping centers, churches and amusements. Bus lines and trucks are becoming important means of transportation.

From the standpoint of vehicular traffic New Jersey is at present virtually isolated from its great metropolitan neighbors, New York City and Philadelphia. The ferries are neither numerous enough nor big enough to transport the swelling volume of horse-drawn and motor-driven vehicles quickly and economically across the Hudson and Delaware rivers. The result is congestion, time losses and money losses which must bulk big in a year and put the break on the development of the State.

Fortunately, however, a vehicular tunnel under the Hudson and a similar tunnel or a bridge across the Delaware are now in sight. Lawmakers and public officials of New York, Pennsylvania and New Jersey are thoroughly awake to the public demand for these vitally needed improvements. Laws making them possible are on the statute books, plans are being formulated, finances are being marshalled and work will soon be begun. The year 1925 ought to see New Jersey linked up closer to and made an even greater part of the stupendous commercial development of New York City and Philadelphia by means of these public works, which, so to speak, form a part of the New Jersey State Highway System.

Waterways. New Jersey has the great advantage of bordering two of the principal seaports in the country. The port of New York accommodates the largest ships afloat and on the Jersey side plenty of water front is available for future development. Delaware Bay up to Camden is accessible to ships drawing 30 feet of water, with the prospect of the harbor being deepened to accommodate the largest ships. Much water front along the Arthur Kill, Newark and Raritan Bays is open to ships drawing 25 feet, and conditions are favorable for increasing the present depths. The important relation of this wharfage to industrial development can be estimated from the rapid and extensive growth at these points.

The right of way for a deep-water ship canal connecting the ports of Philadelphia and New York has already been laid out and preliminary legislation enacted. A future development of this project would pave the way for further industrial development. The present canal facilities are not to be regarded as important factors in the State's system of communications.

New Jersey has many streams which are of great value for shipping purposes on a smaller scale. The Delaware River, up to Trenton, and the Raritan River, up to New Brunswick, are open to ships of moderate size, and may be deepened later. The Maurice River and several others emptying into the Delaware Bay and Atlantic Ocean accommodate a great many small fishing and pleasure boats drawing up to 6 feet.

An inland waterway with a depth of six feet at mean low tide is kept open just inside the sand bars along the Jersey coast, from Bay Head to Cape May, a distance of 117 miles. This waterway is being extended by means of a canal as far north as the Manasquan River and has several outlets into the Atlantic Ocean. Its extensive use by pleasure and fishing boats makes it an important factor in the promotion of resort and fishing industries, which thrive on the Jersey coast.

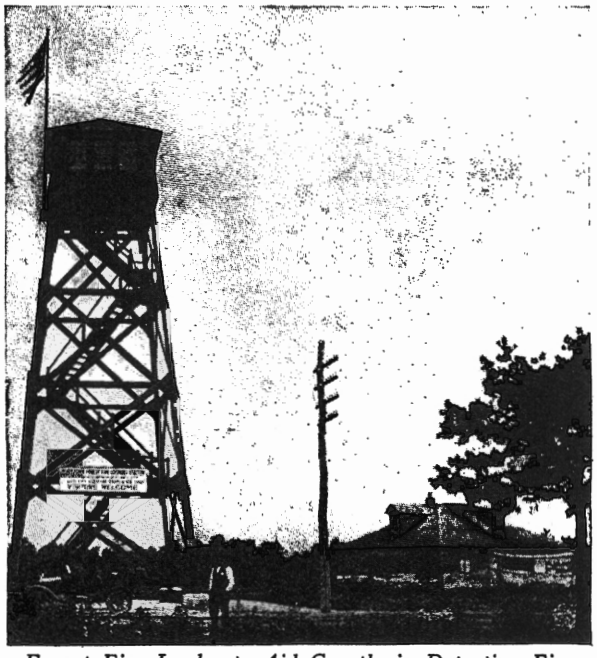
Development is Accelerated. From an industrial standpoint New Jersey is perhaps better equipped than any other State, because of the combined advantages of position and shipping facilities. Being in the center of the country's densest population and at the very gateway to the whole world its industries are best able to receive raw materials and to deliver products to the consumer. The resulting benefit to the commonwealth in ratables is indicated by the tremendous development of the metropolitan district. But our advantages are by no means limited to one locality, and industrial growth is possible in other parts of the State.

Nor is the movement towards New Jersey limited to industries. The appreciation of proximity and accessibility to markets is leading farmers in other states to take advantage of our fertile soils, which are adaptable to every type of farming. By rail there is practically no section of the State more than four hours away from New York or Philadelphia. Our improved highways have made possible the extensive use of trucks for delivery of products to the many large cities and coast resorts, while the waterways adjacent to many farming sections afford safe and quick transport for fruit and vegetables. Rural life without isolation is a strong reason for the increasing popularity of the State's farmlands.

Around our large cities, and particularly within commuting distance of New York and Philadelphia, suburban development is extending rapidly as a direct result of our dependable facilities for travel. The ideal home life made possible in this way is attracting thousands of new citizens to the State, bringing in capital earned outside our borders.

The Jersey Coast and the lake and mountain resorts, for all their popularity, have only begun to express the benefits of their accessibility to large populations. The short trip to any of the State's recreation grounds is an important consideration to the great majority, who have but little time to spend away from business, and no surplus of money.

F. F. Tower—The Anti-Forest-Fire Demon



Forest Fire Lookouts Aid Greatly in Detecting Fires

Non-Agricultural Land Producing a Valuable Forest Crop

A State Fire Warden, with Helpers, Fighting a Forest Fire

Forest Resources

W. M. BAKER.

A Neglected Resource. New Jersey's two million acres of woodland are one of the State's most valuable assets, even though they are at present in a run-down condition from generations of abuse and neglect. The causes for this degradation—chiefly forest fires and wasteful lumbering—are too well known to need further comment. The damage has been done; now we must take an inventory of what we have left, and determine what can be done with it. The fact remains that this vast area of despised "waste-land," if properly protected and managed, can be made highly productive and valuable to the owners, and to the State.

When New Jersey was first settled, the entire State was forested, but through generations of lumbering and clearing land for agriculture and industry practically all the original or virgin timber has been cut, and the woodland is now reduced to 45% of the State's area. Not all of this remaining two million acres is producing timber, for much of it has been so frequently burned by destructive fires, so abused by lumbering and so neglected by its owners that it is now either an unsightly slashing or non-productive brush land.

Reasons for Development. What to do with this non-productive half of the State's area is one of the most important questions confronting the people of New Jersey. The assessed valuation of our woodlands is now less than $6,000,000, and their value is decreasing annually. How this question should be answered, and what action should be taken, is self-evident when the following facts are considered:

First, when reasonable protection and practicable management of our woodlands replace present neglect and indifference, their productiveness can be so increased that they will yield an income on two hundred million dollars! Instead of a constantly decreasing crop, whose net annual stumpage value

Properly Managed, a Woodland Will Yield Valuable Products

is considerably less than one million dollars, a net annual yield exceeding ten million dollars can be realized. The accuracy of these figures is proven by results obtained from woodland now under forestry management; they are conservative because they are based upon past prices rather than future expectation values.

Second, the people of New Jersey now import more than twenty times as much lumber as our forests produce, with the resulting annual expenditure of millions of dollars for lumber from other states and for freight charges on long hauls. In the future the greater part of this demand can be met by home production, with resulting benefit to local woodland owners as well as to consumers. We must always continue to import some of the better grades of lumber, but far more lumber, and a large part of the so-called "round timber" products, such as poles, piling, mine-timbers, ties, posts, and such products as cordwood, basket stock, box-boards, pulpwood, farm timbers and wood for special uses can be grown within the State.

Third, our woodlands have a great recreational value, the appreciation of which is constantly increasing. Vacationists and tourists by the thousand visit the Adirondack and Catskill regions of New York, enriching the State by millions of dollars annually. There is no reason why the pine forests of South Jersey and the wooded mountain and lake region of North Jersey should not enjoy similar popularity, situated as they are between the population centers of New York and Philadelphia, not to mention New Jersey's home population of over three million. But desolate slashings, monotonous brush areas and unsightly burns do not attract people bent on pleasure. Nature's mantle of forest growth must again beautify these regions before their natural attractiveness can be fully realized. With her woodland area forested, New Jersey's inland playgrounds should rival in popularity her justly famous coast resorts.

To bring the State's woodlands to the condition from which these benefits may be derived is the aim and purpose of the Forestry Division of the State Department of Conservation and Development, and considerable encouraging progress has been made. The forest policy of the State has been and must continue along the following lines:

Forest protection is absolutely essential before any constructive development is practicable. Forest fires must be checked before forest property can be made safe for production. An adequate Forest Fire Service will provide forest security at a reasonable cost; its efficiency must be permanently maintained, for a moment's relaxation may undo the work of years of protection.

For more than ten years the State's Forest Fire Service has been growing into a well-organized system for the protection of woodlands. Marked progress has been made, but the handicap of inadequate facilities to practice and preach fire prevention and control must be relieved. The organization consists of nearly four hundred local firewardens and patrolmen in the wooded sections, under the supervision of the State Firewarden and his assistants, whose duty it is to prevent and suppress forest fires. Much valuable co-operation has been secured from the railroads which maintain protective fire-lines along their right-of-way, and from other organizations and individuals.

Prompt detection of fires is absolutely necessary to their control. At the present time the State is handicapped by the lack of sufficient Forest Fire Lookout Towers. Three towers are now in operation and four are being erected, but many more are needed.

With a public that realizes the danger and damage of forest fires, so that the number of fires can be checked, and with an organization that promptly detects and controls the fires that do start, the practice of forestry becomes practicable and its progress assured.

Forestry Explained. Forestry means the common-sense, practical management of woodlands, so that the land may be constantly producing the best crop possible. Forestry advocates that only land unsuited for agriculture or other uses be maintained permanently as woodlands, for it is economically unwise to use land of high value for timber production when there are within the State approximately one and a half million acres—steep or rocky hill-land in North Jersey and sands of low fertility in South Jersey—that cannot be used profitably for any other purpose. On the other hand, present woodland should be maintained as such until it is needed for other uses. With approximately four hundred thousand acres of neglected or abandoned farmlands within the State, it is obvious that the present need is for more farmers rather than farms. Approximately one-fourth of the present woodland area of New Jersey will be suitable for agriculture when cleared.

Before the practice of forestry can become general, woodland owners must realize that forestry is simply farming applied to the woods; that by its practice lands otherwise idle or worthless may be made profitable. Any forest may be regarded as a growing crop, to be protected, encouraged, cultivated and finally harvested according to the most profitable methods. Under proper management an area of woodland will produce a continuous crop, maturing at intervals, and yielding the maximum quantity and quality of products.

Private Forestry Practicable. The State of New Jersey owns less than one per cent of the forests within her borders; the total area of the State Forests is now approximately 17,000 acres. It is believed unnecessary to withdraw any large proportion of the State's woodland from private ownership, because relatively small State Forests will serve every purpose of demonstrating the practicabilities of forestry. Since the greater portion of New Jersey's woodlands are privately owned they must be managed in the interest of their owners as well as of the public. Forestry can be practiced by any capable person; it employs labor and teams in winter when other work is slack; it requires no special tools or equipment; it brings in ready cash by sale of products. Forestry stabilizes the whole management of a farm, and provides necessary lumber and fuel for home consumption at a minimum cost.

Forest Planting. The common idea that forestry begins and ends with forest planting is wrong. In this State it is advised only where land has been unwisely cleared, where all growth has been destroyed by forest fires, or where other peculiar conditions exist. At present natural reproduction is usually sufficient and satisfactory. The time will come when more intensive methods should be employed and planting resorted to; that time is not yet here except for restricted areas.

State Aid. Because most forest holdings are too small to justify the employment of a forester, and because the practice of forestry on private land must be encouraged for the benefit of the public, the services of the State Foresters are offered, so far as their time will permit, to all who ask for them. The only cost is the foresters' actual field expenses The State Foresters are prepared to advise owners as to the proper cutting of their woodlands, the methods of forest planting, and the marketing of their products. In short, how to make a paying proposition out of what in most cases is merely a left-over. Encouraging progress has been made in the work—but after all it is merely a beginning.

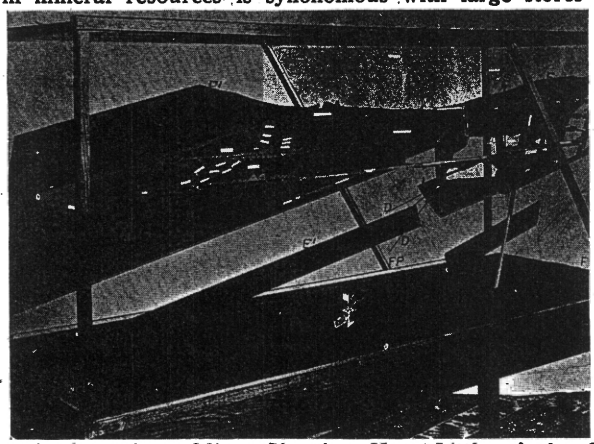
Time to Start. There has already been too much delay in starting a sane conservation movement; any further delay will make a bad situation even worse. Finally, it must be remembered that the extent to which forestry can go depends upon public interest and action.

No Oil Fields, But the Greatest Refineries in the Country

Mineral Resources

HENRY B. KUMMEL, Ph.D.

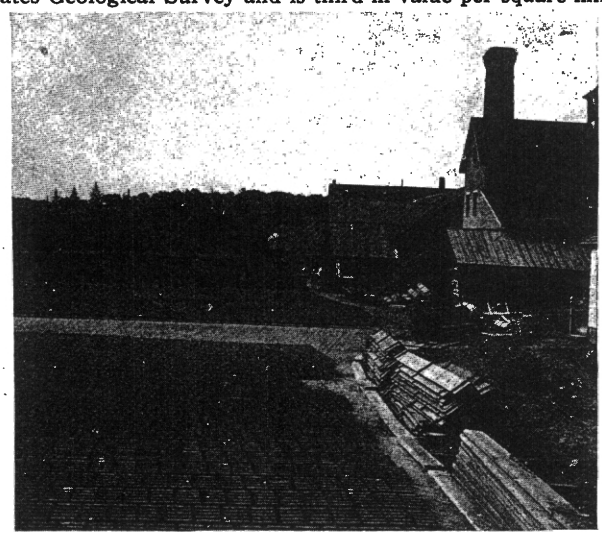
New Jersey is so pre-eminently a manufacturing state that the importance of its mineral resources is largely overlooked. This is due perhaps to the fact that in the popular mind the term mineral resources is synonomous with large stores of



Model of an Iron Mine, Showing How Little of the Ore Deposit Has Been Removed

coal, oil, natural gas, or with the precious metals, gold, silver, platinum, while the common and widely distributed mineral substances like clay, sand, gravel, stone are largely overlooked.

New Jersey is *forty-sixth* among the states of the Union in point of size, but is *fifteenth* in value of its mineral products, as this value is computed for the Nation by the United States Geological Survey and is third in value per square mile.



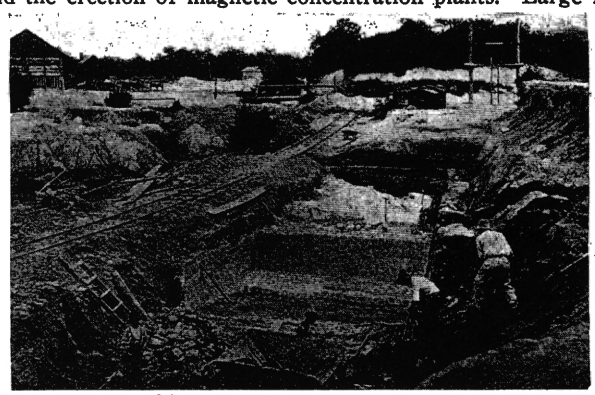
Bricks Being Sun-Dried—An Industry Based on Natural Resources

When it is remembered that New Jersey contains none of the mineral fuels,—coal, oil, or gas, none of the precious metals,—platinum, gold, or silver, and produces no copper, lead, nickel, or tin, the importance of its more humble mineral resources is emphasized.

How many people of this state realize that it ranks second in the production of zinc and that the output of the two zinc mines of New Jersey exceeded in value that of any other state except Oklahoma. Not only so, but that the ore body in these mines is the most unique in composition, the largest and probably the richest of any known zinc ore body in the world. Located at Franklin and Ogdensburg in Sussex County, these ore bodies are famous not only for their zinc content but for the large number of associated minerals, of which about 100 species have been described. Metallic zinc, zinc oxide and spiegeleisen are the chief products derived from this ore. The annual output is between 600,000 and 700,000 tons, and about 9½ million tons of ore have been taken from these mines since 1880.

The iron-ore industry goes back to very early colonial days. First developed in South Jersey by the utilization of bog-iron ore (1685) it soon spread northward and 25 years later the Dickerson mine at Succasunna was bought. According to a census in 1784 the state then had eight blast furnaces and seventy-nine forges.

The maximum annual output—nearly a million tons—was reached in 1882, there being at that time about 100 active mines. The following quarter century witnessed a decline in the industry, the abandonment of many mines, and the consolidation of others in the hands of a few strong companies. In still more recent years there has been the expenditure of large sums for new shafts, underground development work, and the erection of magnetic concentration plants. Large in-



Mining Scene in a Clay Pit

vestments have been made by strong financial agencies, and a number of new ore-bodies have been developed. Reserves of 100,000,000 tons of good ore are claimed by experts for a single company. There is every indication that New Jersey's iron mining is on the eve of a marked revival. The industry at present is localized in the Oxford Furnace, Dover, Wharton, and Ringwood districts. About 400,000 tons have been mined annually in recent years, but there have been great fluctuations both in tonnage and values. Upwards of 22 million tons have been mined since 1870.

While the zinc and iron-mining industries are of no small importance, the clay and clay-working industry is chief in rank. The district around Woodbridge, Perth Amboy, South Amboy, and Sayreville is the clay-mining center of the state,

There Is Plenty of Trap Rock for Road Building and Other Purposes

where is chiefly dug the high-grade ware, fire and terra-cotta clays, as well as many cheaper varieties. There, too, are located great factories for the manufacture of fire-brick, ornamental terra-cotta, fancy brick, fire-proofing, hollow ware, and building brick.

Trenton, as is well known, is the great pottery center of the state, indeed one of the two great pottery centers of the country, although the clays used are not found to any large degree in that vicinity and in fact are largely imported from other states, or from abroad. Value figures mean but little in these recent days of soaring prices and production limited by a fuel administrator, but an annual production valued at nearly $22,000,000 for the clay and clay-products industry in 1918 is a measure of its importance.

The stone industry has passed through many vicissitudes, and has in recent years changed entirely in character. The passing of the "brown-stone" front from popular favor, and the substitution of reinforced concrete for abutments, bridge piers, etc., have closed nearly all brown-stone and sandstone quarries formerly operated. On the other hand road building, and the use of concrete in all kinds of construction have created a great demand for crushed stone—particularly trap rock and large amounts are annually produced. Limited amounts of slate, and larger amounts of limestone are also quarried. The annual value of the stone industry is about $2,250,000. The above does not include the value of the very large amount of cement rock and of limestone used in the manufacture of Portland cement or of lime, which is included in the value of the finished product. For many years New Jersey was the second state in the production of Portland cement but in recent years its relative rank is much lower, not because of any great diminution in the product, but because of the great growth of the industry in other states.

Sand and gravel are not regarded by most people as important mineral products. Nevertheless their annual value in New Jersey amounts to about $2.500.000. The gravel is

A Talc and Serpentine Quarry

used chiefly in road building and concrete, while the sand includes varieties used for building, molding, glass, grinding and polishing, paving, furnace purposes, filters, engine use, and a multitude of minor uses.

In the greensand deposits—or marl as it is more commonly called—the state possesses vast stores of potash, which unfortunately cannot readily be made available for plant use except by somewhat complicated chemical treatment. Efforts were made during the war, and are not entirely abandoned, although halted in some degree, to recover the potash from these beds. The future may record the development here of a strong industry.

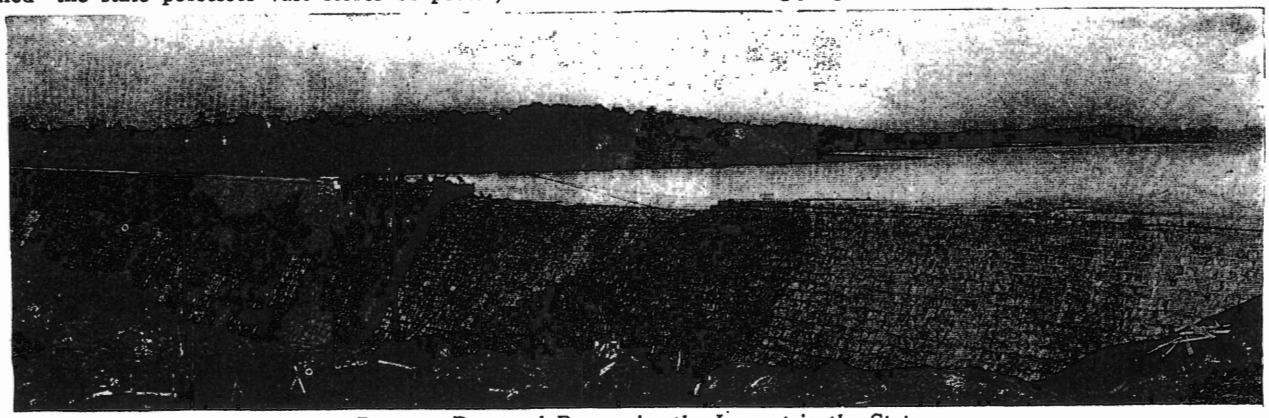
For many years some of the peat bogs have been utilized in the production of humus and peat fertilizers—a use which has increased so that New Jersey leads other states in this

Digging Sand as a Raw Material for Big Industries

respect. Efforts to use it as a fuel have been failures here as in many other places.

The total value of the mineral products of New Jersey for 1918, the most recent year for which statistics are available, is about $48,500,000.

Oil. At the present time there is an intensive search all over the country for new oil pools. Not only are new wells being drilled in proven territory, and in regions where geologic structures are favorable and oil-bearing formations are known to be present, but much money is being spent in testing regions where the best expert opinion is unfavorable. New Jersey is not an exception. In view of this wide-spread interest it seems advisable to state here that no facts are known to the State Geologist and his associates, which in their opinion support the view that oil in commercial quantities occurs in any strata in New Jersey. On the other hand there is considerable evidence against such occurrence. Favorable structures are not known to occur. The many artesian wells drilled to all depths up to 2,300 feet have shown no signs of oil. The absence of salt water as shown by these wells, in beds which were formerly saturated with it, indicates a long-continued and thorough underground circulation, which may be expected to have expelled the lighter oil, even if conditions had originally favored its formation. The drill is of course the final arbiter by which the beliefs of prospector and expert can be tested. If the drill should discover oil in New Jersey's rocks, present views must be modified ,but until such discovery has been made, the State Geologist can only advise all interested parties that, in his opinion, the chances are overwhelmingly against the success of their venture.

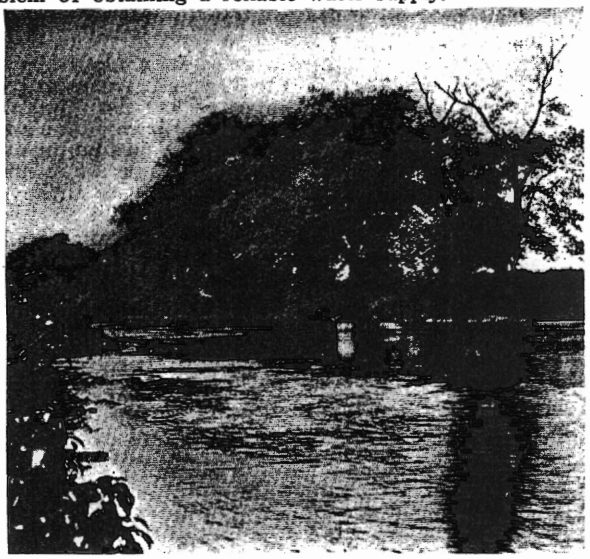


Boonton Dam and Reservoir; the Largest in the State

Water Supply Development.

H. T. CRITCHLOW.

Industrial development, as well as healthful living conditions, are dependent upon an adequate supply of pure and wholesome water. The location of our most important cities and industrial centers along water fronts and large rivers has been due principally to the advantage of a navigable highway, but in many cases such locations have also simplified the problem of obtaining a reliable water supply.



Junction of Millstone and Raritan Rivers and Undeveloped Source of Water Supply for the Metropolitan District

The original source of any water supply is in the rain and snow, regardless of whether the supply is taken from a spring, well, lake or stream; and the amount of water which may be obtained is dependent upon the amount of rain and snow falling upon the caschment area of the source of supply.

New Jersey is situated in a region of abundant rainfall which is relatively well distributed throughout the seasons of the year. The conflagration and character of the earth's surface largely controls the rate at which the rainfall finds its way into the surface and underground channels. The catchment areas of streams within the State of New Jersey are comparatively small. The territory south of a line drawn through Perth Amboy and Trenton is characterized by alternating layers of sand, gravel and clay, sloping gently to the southeast. This area is known as the Coastal Plain area. A large portion of the cities and towns in this area are abundantly supplied with underground waters obtained through driven wells; while other places experience little difficulty in obtaining plenty of water from the streams traversing the gently sloping sandy areas, which have a comparatively uniform flow throughout the seasons. The large natural ground storage for both underground and surface supplies reduces in a large measure the amount of artificial storage that has to be provided to tide over seasons of drought. These conditions make the development of additional water supply for future needs of the Coastal Plain area a relatively simple problem.

North of a line through Perth Amboy and Trenton the ground becomes rolling, increasing to hilly and mountainous in northern and western portions. This latter area is known as the Highlands. The consolidated and rocky nature of this area, combined with the steep slopes of the valleys, causes the rainfall to collect rapidly into the streams and discharge into the sea. While underground water may be obtained in greater or less quantities from wells throughout much of this territory, the chief supplies are from surface sources. However, mention should be made of several groups of wells in the Plainfield-Summit-Elizabeth district, which yield large quantities of good, wholesome water from underground storage in the glacial drift. Large supplies from the streams are available only when storage reservoirs are provided to impound the flood waters for seasons of low stream flow. Another factor which limits the available supply is the unwarranted pollution of many of the rivers in their lower reaches. This necessitates locating intakes and reservoirs above the points of objectionable pollution, thus diminishing the catchment area tributary to the supply.

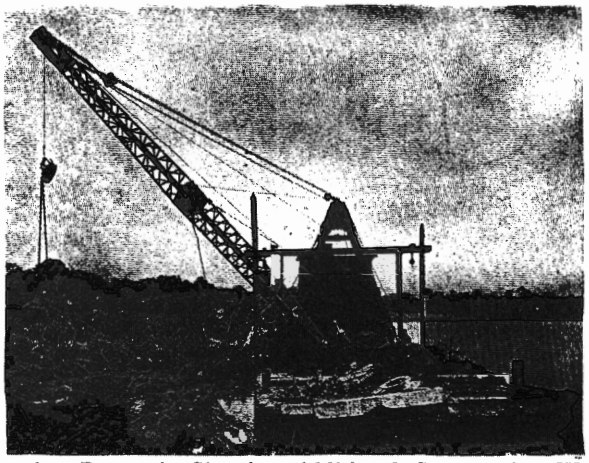
The Metropolitan district, embracing the six counties of Bergen, Essex, Hudson, Middlesex, Passaic and Union, has an estimated population of 2,100,000 or about 65 percent of that for the entire state. The consumption of water in this area during the past year averaged in round numbers 237,000,000 gallons daily, 83 percent of which was derived from surface streams and 17 percent from wells. This water is supplied by 26 systems, the 5 largest of which supply about 86 percent of the total. At the present rate of growth in the Metropolitan district, it is estimated that the population in 1950 will be about 7,000,000 and will need about 650,000,000 gallons of water daily.

Originally, Newark and Jersey City obtained their water supply from the Passaic River without storage, near its mouth, but increased pollution necessitated the abandonment of this source and the construction of reservoirs on the headwaters and the laying of long pipelines. The Pequannoc River above Butler has been developed to its economic limit and is now supplying a little over 50,000,000 gallons daily to Newark. This amount is barely adequate and Newark is in urgent need of a reserve supply. The present development on Rockaway River at Boonton has reached its limit in supplying Jersey City with about 50,000,000 gallons daily. By providing additional storage works, the Rockaway is capable of furnishing about 90,000,000 gallons daily, and these communities already supplied from it will naturally look to it for their future needs.

The Passaic River at Little Falls is used without storage, to supply about 43,000,000 gallons daily to Paterson, Passaic, Bayonne and 12 intervening municipalities in Passaic and Essex Counties. The Wanaque, one of its tributaries, is now being developed to the extent of 50,000,000 gallons daily for Newark and other cities. With complete storage, including Greenwood Lake, this watershed is capable of supplying about 77,000,000 gallons daily above Midvale. The Ramapo above Pompton Lake, though subject to pollution can be developed to the extent of about 82,000,000 gallons daily. As alternatives to the above, it is possible to develop storage sites on these in such a way as to supply about 300,000,000 gallons daily from the Passaic at Little Falls without unduly depleting the dry-season flow below.

Hackensack River above New Milford is supplying about 32,000,000 gallons daily to over 40 towns and cities near Hudson River in Bergen and Hudson counties. It is entirely practicable to develop this supply to 65,000,000 gallons daily.

The companies which serve Elizabeth, and 28 other places between the Central Railroad, Raritan River, and the Arthur Kill, draw from 13 different sources, surface and subsurface, but need a large additional supply. This can be obtained best



Clearing Reservoir Site for Additional Storage for Water Supply

from Raritan River and the Department of Conservation and Development has approved a plan for taking a maximum of 20,000,000 gallons daily from this stream without storage, an increase of 60 percent over the present consumption. With full storage the Raritan is capable of furnishing 500,000,000 gallons daily, but it is not likely that more than one quarter of that amount will be needed from that source in the next 30 years. While not as desirable as the tributaries of the Passaic mentioned above, this water is capable of being made entirely satisfactory for a public water supply.

The following table summarizes the present and estimated future draught upon present and other nearby sources of supply to meet the probable future consumption in the Metropolitan district, quantities in million gallons daily, viz:

Source of Supply	1919	1950	Total Capacity of Source
Pequannoc River above Butler	50	50	50
Rockaway River at Boonton	50	90	90
Passaic River at or above Little Falls*	43	250	300
Hackensack River at New Milford	32	65	65
Local streams	17	15	15
Driven Wells	39	60	75
Raritan River	0	120	500
Musconetcong River	0	0	90
	231	650	1,225

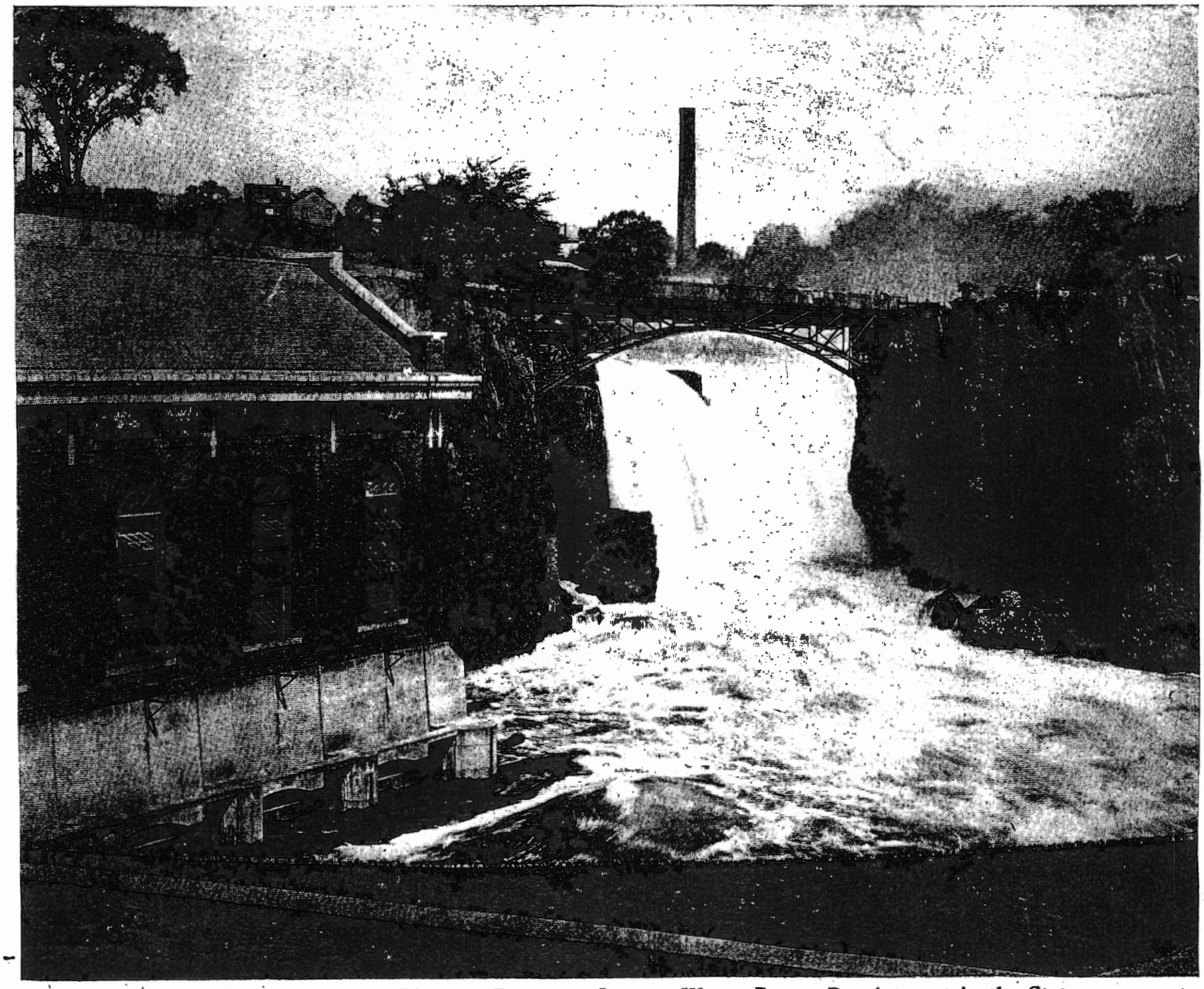
* Including the Wanaque and Ramapo development.

It is therefore apparent that the danger is not in a lack of sources of supply but rather an inequality of opportunity and inequitable distribution relative to the concentration of population.

As supplies from the appropriated watersheds are completely utilized, recourse must be had to more remote sources. In some instances this may necessitate united effort by districts which embrace several municipalities. Certainly there must be more cooperation in the future than in the past if this important problem is to be adequately solved.

But along with the study and development of additional sources should go the very important work of conserving the present available supply. It is a well-known fact among experts that a relatively large (25 to 50 percent) amount of the water supplied to many communities is lost through leakage and waste. A number of up-to-date cities have postponed the need for additions to their water-works by instituting water-waste surveys, a more general use of meters on the individual services, and other measures to reduce the per capita consumption. The benefits of such measures should receive the serious consideration of many places which are rapidly reaching the limit of the capacity of their water-works.

Many states have laws regulating the conditions under which waters within their borders may be diverted. In New Jersey the Department of Conservation and Development is charged by law with a general supervision over all the sources of potable and public water supply, to the end that the same may be economically and prudently developed for the use of the people of the State.



Great Falls on Passaic River at Paterson—Largest Water Power Development in the State