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Natural Resources from the Sea and Soil

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IT IS not within the scope of this paper to mention, even less to describe, all the products available to this area from the sea and from the soil. They are too diverse in nature to catalog and insufficiently reported on to permit detailed description. An attempt is made, however, to mention some of the products from both sources that involve a certain amount of chemical processing as contrasted to those that are marketed directly.

Although Maine is a leading state in the production of potatoes, no particular reference is made to that product as a table stock. On the other hand, the conversion of raw potatoes to French fried potatoes is considered as an industry based on the processing of a natural resource. By the same token, although the marketing of lobsters, clams, and other sea foods is a big enterprise in New England, no attempt is made to discuss these resources as marketed directly for table consumption. The availability of these resources from both the sea and soil is well known. However, there may be some interest in the modified forms of these materials and the extent to which they have been utilized.

PROCESSED MATERIALS FROM THE SEA

Although the canning of foods requires relatively little chemical processing, it seems appropriate to mention the size of this industry, if for no other reason than to indicate the amount of metals required to fabricate the cans. The number of plants in the United States engaged in the production of canned fishery products and by-products (4) is listed by areas in Table I. The New England area ranks third with respect to both the number of products and number of plants.

Table I. Plants Engaged in Production of Canned Fishery Products and By-Products in 1950

Area	No. of Products	No. of Plants
New England	109	100
Middle Atlantic	48	48
Chesapeake Bay	44	41
South Atlantic and Gulf	153	148
Great Lakes and Mississippi River	20	20
Pacific Coast	263	215

The extent of the canned sea foods industry as reported for 1950 is indicated in Table II (4), which lists the areas of major production. Maine ranks third, following California and Alaska, in the value of these canned products. Furthermore, the New England area accounts for over 10% of the value of the total pack of canned sea food in the United States and Alaska.

The data of Table II do not include the canned pack of modified sea foods such as fish cakes, soups, and chowders. There are in the New England area, for instance, five plants that produce fish cakes, three that produce fish chowder, and several others that produce sea food specialties.

There is also a substantial industry based on other marine

Resources from the sea available to New England constitute not only a large industry from the standpoint of direct table stock, but also a substantial industry concerned with canning and with processing of by-products. A considerable, though diverse, industry has been developed, based on crops from the soil. Research is in progress, to improve existing products and develop new ones, as it is recognized that the desired accomplishments are largely the result of planned long-range research.

fisheries by-products, which involves a variety of processing techniques. Data on the tonnage and value of these products for the New England area are not available to the author. A list of the major by-products and the number of plants producing them is presented in Table III (2).

The value of fish meal produced annually in the state of Maine is over \$500,000 and that of fish oil about \$200,000 (1). The production of sea moss in 1950 was 1,100,000 pounds (1). The value of this product is, of course, dependent upon the extent to which it is processed.

Table II. Extent and Value of Canned Sea Foods in 1950

State	Pounds	Value Including By-Products
Maine	119,853,307	\$ 33,099,176
Massachusetts, Connecticut, Rhode Island	42,108,843	13,632,182
New Jersey, Pennsylvania, Delaware	24,441,945	14,967,621
Louisiana	10,922,250	16,923,065
Washington	46,273,455	27,215,147
Oregon	26,452,563	19,513,782
California	517,045,017	161,453,535
Alaska	158,294,861	86,769,620
Total	945,392,241	\$373,574,128

It seems obvious, therefore, that resources from the sea available to New England constitute not only a large industry from the standpoint of direct table stock, but a substantial industry concerned with canning these sea foods and the processing of by-products. It is encouraging to note that considerable research is in progress, the object of which is not only to improve existing products, but also to develop new ones.

NATURAL RESOURCES FROM THE SOIL

Minerals and wood are not considered in this paper. As is also true of natural resources from the sea, it is impracticable to describe all the products that are grown from the soil. Certain areas of New England have soil that is particularly well suited to the growth of cranberries, potatoes, and tobacco. The state of Maine leads in the production of potatoes. It may not be generally realized that a considerable industry exists in New England that is based on the processing in modified form of some of these vegetables and berries.

There are about twenty industrial plants occupied in the production of potato starch, all of them located in the state of Maine. This output places Maine as a leading state in this field. The product is widely distributed in the fields of paper, textiles, and adhesives with several special uses. Also from the potatoes of Maine are produced all of the French fries that are marketed as frozen French fried potatoes under a well-known brand name.

The proper combination of soil conditions, weather, and labor conditions has allowed the New England area to develop a substantial industry concerned with the canning of vegetables and

Table III. Fisheries By-Products of New England Area in 1950

Product	No. of Plants
Fish meal	10
Fish fertilizer	7
Fish oils	10
Liver oils	4
Herring scales	3
Kelp	3
Sea moss	2

Table IV. Pack of Canned Vegetables and Blueberries in New England States in 1949 (5)

Product	Cases
Green beans	219,038
Wax beans	433,847
Corn	1,148,067
Peas	158,465
Pumpkins and squash	48,518
Blueberries	604,187
Total	2,612,122

berries. The pack of green beans, wax beans, corn, peas, pumpkins, squash, and blueberries in the year 1949 exceeded 2,500,000 cases. A variety of other products are produced in this area, such as cranberry sauce and jelly, blueberry jelly, and pickles. Some dehydrated foods are also produced in varying amounts at different times. During World War II a large fraction of dehydrated potatoes was supplied to the armed forces from the state of Maine.

It seems evident, then, that there has been developed in the New England area a substantial, although diverse, industry based on crops from the soil. Furthermore, the writer believes that research and industrial development in these fields will result in considerable expansion of existing products and of new products.

INDUSTRIAL RESEARCH AND DEVELOPMENTS

It seems appropriate to quote a statement from an article on "New England's Pulp and Paper Industry" (3).

New England manufacturers are displaying awareness of the challenges they face. They are drawing heavily on their financial resources to provide the millions of dollars required to replace antiquated machinery and to improve plant layouts. Of even more significance, they are re-enlisting their imaginations and ingenuity and taking advantage of the opportunities presented

by changing times to strengthen their positions in the trade. They are making themselves known as sources of a large variety of distinctive and high-specification pulps, papers, and paperboards in order to apply their technical knowledge and skill more advantageously.

The following are some of the accomplishments made by the pulp and paper industry in this area in recent years that tend to support this statement.

The *Paper Trade Journal* (6) describes the extensive improvement of production facilities made by the S. D. Warren Co., Cumberland Mills, Maine. Another pulp mill in Maine was the first to develop and utilize ammonia-base sulfite pulping of wood as an improvement over calcium-base sulfite pulping. Other mills in the New England area have modified their processes to allow the utilization of large fractions of hard wood. Many of the mills have installed expensive equipment to permit better recovery of heat and to allow the production of high grade coated and specialty papers. Another mill has designed a process, and expects to have it in operation in the near future, for the production of sulfur dioxide from pyrrhotite. The process is designed for approximately 9000 tons of sulfur and will alleviate materially the critical shortage of sulfur. The ore is, of course, in close proximity to the mill. It is recognized that these, and other engineering accomplishments, are largely the result of planned, long-range research. That such research is in progress, in substantial quantity, is heartening and bespeaks well for the future of industry in New England.

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Timber Resources

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NEW England is a heavily forested region, despite widespread opinion to the contrary. Seventy-seven per cent of her total area is covered by forests, and those forests are growing a great deal of usable wood. In fact, they are growing as much wood as is being removed from them, except in a few special categories. There is an excess of usable hardwoods. This excess is so great and the hardwoods are so usable that the National Production Authority has recently received applications for certificates of necessity involving new pulp facilities in New England valued at \$11,000,000. The new facilities are expected to consume over 200,000 cords of hardwood per year, and there will still be plenty left.

New England contains more than 31,000,000 acres of forested

land (Table I), slightly over half of which, or 17,000,000 acres, is in the state of Maine. New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island have lesser and lesser amounts. Less than 1% of this total forest land is noncommercial, so that the great bulk of the land is available for the production of timber crops, provided they are cut properly. Each year there is less acreage available for heavy or destructive cutting.

The many and varied forest stands of New England can be reduced to four principal forest types (Figure 1). The spruce-fir type that is found in the northern portion supplies most of the wood for the extensive pulp and paper industry of New England. Spruce and fir predominate in this type, with the fir rapidly taking the commanding role. Mixed with these two species are varying

Resources

NEW ENGLAND