THE COMMERCIAL SEAWEED INDUSTRY

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Why are seaweeds of interest to fishermen? Probably they are not of interest to very many fishermen now, but the fishermen might find it useful and profitable to learn something about them.

In several parts of the United States, especially in California and North Carolina, fishermen find that they can use their same boats and crew to gather seaweed for a good price at times when the fish are not running. The diving technique of the men who gather red seaweed for agar in California is similar to that of the sponge fishermen in Florida.

Fishermen on the west coast of Florida have been bothered by seaweeds getting in their nets, clogging them up and rotting the net if it is not removed. They call these nuisance plants "rolling moss" or "gumbo". In a few years they may find it more profitable to harvest the "rolling moss" than the fish!

Which seaweeds are valuable? The answer to that depends upon the use to which the seaweed is to be put. Almost all seaweed is valuable for fertilizer and for animal food. The reason for this is that these marine plants have accumulated from the sea water hundreds of times more of certain essential elements than was present in the sea water. When these plants are allowed to rot in soil, the valuable minerals are gradually released to the roots of the crop plants while the equally valuable organic matter in the seaweed helps to retain both water and minerals in the upper part of the soil where they are available. These same minerals and vitamins in the seaweed explain its particular value as animal food. Pigs on an isolated Alaska island during the war were showing symptoms of serious mineral deficiency as long as they were penned up and fed imported food. When released they raced to the beach and feasted on the seaweed, curing their diseases in a few days.

Three kinds of red seaweed are used commercially in the production of agar, that gelatinous material which is so widely used in food products such as bakery products, marshmallows, and jellied meat; in many medicinal preparations; and in many industrial products including bacterial culture media, dental impression material, and insecticide carriers.

The commercial agar manufacturing companies in California extract the product from Gelidium seaweed which grows on the rocks in fairly shallow water. The California production was able to expand enormously during World War II to meet part of the demand when the Japanese agar supply was cut off.

Surveys of potential commercial sources of agar on the Atlantic coast were made during the war by Dr. Harold Humm of the Duke University Marine Laboratory and the scientists of the Institutum Divi Thomae at Palm Beach, and the University of Miami Marine Laboratory. As a result of this work, tons of Gracilaria are now harvested annually in Florida and North Carolina, usually by fishermen, for agar production.

In addition, Dr. Humm and his associates at Beaufort, N. C., perfected the details of a chemical method of changing worthless seaweed extracts into substances even more valuable than natural agar because chemical treatment can be adjusted to control the two critical physical properties: gel temperature and gel strength. This discovery may pave the way

for a rapid expansion of the seaweed industry in Florida where considerable Hypnea, Digenea, and other seaweeds might now be used.

Professor Rivero of the University of Havana has told me of a friend of his in Cuba who regularly produces agar for use in hiw own laboratory from seaweed growing nearby. It may be that commercial agar production will be possible in Cuba and perhaps other parts of the Caribbean.

In New England an industry has been established for many years producing a gelatinous product from Irish Moss, or Chondrus crispus. This was used to a limited extent in food products such as blanc mange. Then during World War II the company learned to purify their product, names it carrageenin, and found it then useful in a long list of new food products, especially chocolate milk, drug products, cosmetics, and industrial products.

Even more phenomenal is the rapidly spreading popularity of algin which is now produced in large quantities from the large brown seaweeds called kelps in California and New England. This relatively new compound finds everyday use in some 17 kinds of food products such as ice cream and cheesespreads, 4 kinds of drugs products, 5 kinds of cosmetics, and over 20 industrial products including some very promising fibers.

Tests here show that the common gulfweed, Sargassum, contains a good quality of algin. Economic studies are required to determine if the enormous quantities of this seaweed in Florida and the Bahamas can be profitably used in algin production.

The history of each of these seaweed products is the same. The crude seaweed found very limited uses. When methods of purification of specific compounds were perfected, many new uses became possible. Now in the future the chemist and the biologist, working together, will be able to improve on nature and alter these materials to produce superior products.

All of this has taken and will require more careful scientific study and experimentation. Well-staffed and well-equipped marine laboratories are required to do the necessary preliminary work before we can say: "In such an area you can harvest so many tons of this seaweed for these months of the year and produce this many tons of product which you can sell for so much a pound with a net profit of so much." Yet that is exactly the information a cautious investor should have before setting up even pilot plant operations.

In many ways the seaweed industry is a companion to the fishing industry. It is having many of the same problems. Individual companies are seeking exclusive harvesting privileges in the best collecting areas. Careless "overfishing" has temporarily ruined some of the best areas. Methods of collecting and handling are still crude, usually devised and built on the spot without any information as to similar equipment.

The seaweed industry is relatively young in the United States. It is undoubtedly destined for great expansion in the next decades. We hope that the University of Miami Marine Laboratory may contribute significantly to the solution of the many problems which will arise as this seaweed industry takes its place beside the fishing industry in Florida and the Caribbean.