quantity of water for this purpose, considerable of the advantage that otherwise would be gained by driving off water from the system will be lost. Each Oficina should have its own solution as to which method will give the cheapest cost and the best results.

In the above brief discussion only those methods have been mentioned which have been tried on an actual operating scale. There are a number of other possible means, but the ones described are those which at the present time are giving satisfactory results in the few Oficinas that so far have appreciated the opportunity that they have for the manufacture of a valuable by-product. A number of the larger companies are giving serious study and consideration to this new development of the nitrate industry and a year undoubtedly will see a number of other Oficinas producing potash.

UTILIZATION OF THE SHARK FOR FOOD AND LEATHER¹

By Allen Rogers

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From time immemorial the shark has been considered as an enemy to man and as a scavenger of the sea. He has been pictured as the cannibal of the deep, and in fiction has been painted as the monster who lurks about the ill-fated ship in order to devour the unfortunates who may have met their death in the gale or on the reef. We, therefore, for generations have cherished an antipathy for this creature of the sea and have been very willing to accept as fact all of these stories, never stopping to consider that perhaps after all the shark might have a few points in his favor.

To begin with, the shark does not live exclusively on the flesh of man. In fact, there are only a few species who would eat human flesh even if it were possible for them to secure it. The principal species considered a man eater, the tiger shark, probably has seldom had the pleasure of this delicacy. Sharks, like all other fish, live on the smaller fish; thus upholding the proverb that the big fish eat the little ones.

Sharks travel in schools or singly and are found most abundant where food fish are plentiful. They are especially fond of the mullet, menhaden, mackerel, and sea trout. Thus it will be seen that they are migratory and at various seasons are found in different waters. They are naturally warm water fish which accounts for the large number found in the Gulf of Mexico, along the coast of Florida, and the West Indies. Being rapid and powerful swimmers they often follow ships for hundreds of miles picking up food as it is thrown over the side of the vessel. Thus their diet at such times is not unlike that of our domestic hog and poultry. It is claimed by fisher folk that the shark will not eat unsound food, which shows him even more particular

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than our friend the porker. Why, then, if he is so clean in his habits of life should we discriminate against him?

The Bureau of Fisheries for several years has endeavored to interest the people of this country in using shark meat as an edible product, with a certain amount of success. In fact, that species of shark known as dog fish is being canned in large quantities and sold under the name of gray fish. Certain fisheries on the New England coast are removing the head, tail and fins and selling the product in Boston and New York as deep sea sword fish. In Boston also shark meat is being sold as such to the Italian trade who appreciate its food value and enjoy its delicate flavor. Why, then, should we not take a lesson from the Italians and acquire the sharkeating habit?

For the past five or six years the writer has been interested in developing a method for converting shark skins into a merchantable leather. As a result of this work several processes have been devised which have been assigned to the Ocean Leather Company operating fisheries at Morehead City, N. C., and Fort Myers, Fla. This concern alone expects to get up to a catch of 1000 fish daily, although at present they are not taking this number. The skins are now being manufactured into leather, the livers rendered for their oil, and the flesh converted into fertilizer stock. It is estimated also that at least 1000 sharks can be secured daily from the fishermen handling food fish, who at present simply kill the sharks getting into their nets and throw them back into the water. By this wasteful procedure on the part of the fishermen at least 1000 sharks daily are destroyed along the Atlantic coast. Thus not only is the skin lost to the leather trade, not only is the liver oil discarded, not only is a large amount of fertilizer material made unavailable, but at least 50 per cent of the weight of the shark which would be fit for human consumption goes to waste.

A conservative estimate based on the above figures indicates that for a catch of 2000 sharks daily, at an average weight of 200 lbs., there would be 400,000 lbs. of fish. As at least 50 per cent could be used for human consumption we would have 200,000 lbs. daily or 73,000,000 lbs. annually. Assuming that the market price could be set at 10 cents we have a saving of \$7,300,000.

The question of supply is one that is constantly being asked. From personal observations and those of men who are most familiar with the subject, it seems evident that the supply is inexhaustible. Another question is often raised as to the best method to prepare the flesh for market. The answer is, cold storage. This method, however, may not always be practical in isolated fishing stations; recourse must then be made to salting, smoking, or drying. The fresh meat, however, is the most delicious, and when boiled, broiled, or baked furnishes a white, flaky food closely resembling halibut or sword fish.

A source of food supply so extensive warrants our most careful consideration and it is hoped that the time is not far off when we may overcome our prejudice and take advantage of Nature's abundant supply.

NOTES AND CORRESPONDENCE

CHLORINE AND INFLUENZA¹

By Charles Baskerville

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The sharp contrast in the number of cases of influenza during the severe epidemic of 1918, observed at Edgewood Arsenal among the soldiers on duty in the chlorine plants to others in the Chemical Warfare Service on the reservation, prompted an investigation as to experience elsewhere. Colonel Walker suspected chlorine as the benign prophylactic and Major

¹ Presented in abstract at the 57th Meeting of the American Chemical Society, Buffalo, N. Y., April 7 to 11, 1919.

Vaughan supported it for the writer with a detailed report on the conditions which obtained at Edgewood. Information was then sought and secured from practically all chlorine producers in the United States and many users. No data were obtained from bleacheries (cloth) or water purification plants where chlorine was used. Cordial and frank responses came, with permission to use names in some instances. In case of others confidence was enjoined, hence with the single official reference cited, names and places are omitted in this report.

A digest of correspondence with some 25 producers of chlorine products indicates a very pronounced belief on the part of the