OIL & FAT INDUSTRIES

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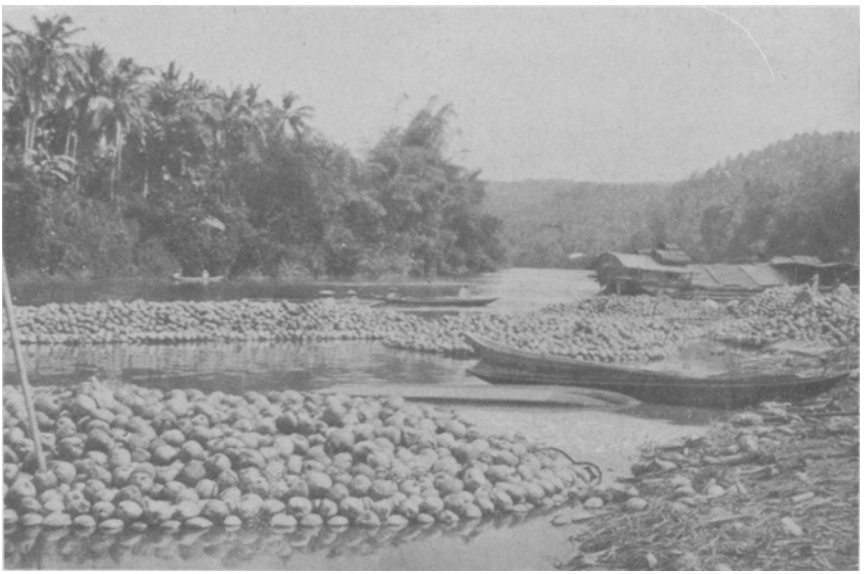


Ewing Galloway

Rafts of coconuts arriving at copra drying plant, Philippine Islands. Note many coconut palms in background

The Organic Oil Industry

The Romance of a Waking Giant

BY JAMES H. COLLINS

A COUPLE of years ago, word came to the Tasmanian government that penguins on Macquarie island were being marched up a sloping plank and cooked alive in steam digesters for the sake of their oil, and being so ruthlessly slaughtered that they would soon become extinct. Macquarie island is in the South Polar Seas, half way between the Antarctic continent and Tasmania, and belongs to the latter colony.

The government suspended the license of a company extracting penguin oil until it was shown that the birds were killed before going to the digesters; that the company's

employees killed from 75 to 100 sea-tigers every year, each with an appetite for 25 to 30 penguins a day; that the squa-gulls which eat penguin eggs were being killed; and that the penguins, far from being in danger of extermination, were numberless, being counted, not in thousands, nor hundreds of thousands, but by acres.

If you buy a cake of soap in Australia, or New Zealand, very likely it is made of penguin oil.

If you buy a cake of soap in Chicago, it may be made from animal fat by-products of the packing industry. Bought in Paris, it may be made from cocoanut oil, in London from soy bean oil, in Copenhagen from fish oil, in Barcelona from olive oil. Or it may be made of tallow, lard, cotton oil, peanut oil or palm oil in these or other places, because the soap-maker, competing with half a hundred food industries for his raw materials, must get them where he can.

The scrap of news above from the South Polar seas is typical of a great industry that has grown up almost in the present generation, and that the public knows very little about, because it doesn't begin to know itself. This is the business of finding and extracting organic oils, fats and waxes scattered over the face of the globe. It extends from the Arctic to the Antarctic, all around the seven seas, and beneath them, and in the air, with ramifications on every continent, in every civilized country, and even savage islands.

Ewing Galloway

Typical colony of penguins on an Antarctic island

Yesterday, fat was fat, just as steel was steel—suet, tallow or lard. Today, as there are hun-

dreds of varieties of steel, so there are hundreds of varieties of organic fats, drawn from vegetable, marine and even insect sources as well as animal.

The engineer, designing an automobile, specifies different kinds of hard, tough or malleable steel for various parts, according to the work they have to do. The time has come when organic oils, fats and waxes are used for specific purposes, according to their particular properties.

From the viewpoint of both production and consumption, these materials are fascinating.

They come from every clime. Up in one corner of Brazil there is a little state called Ceará, fertile and productive in normal times, but subject to terrible droughts. When the drought comes, the Cearanese used to turn to rubber—it was largely their enterprise that developed the industry on the Amazon. But rubber has now been stricken with something that promises to last longer than a Cearenese drought—the competition of the Oriental plantation product, which can be grown far below the cost of gathering wild rubber. So the Cearanese, who are called "the Yankees of Brazil," are enterprisingly developing an industry in the gathering of wild nuts that yield vegetable oils, as well as increasing their output of carnauba wax.

The animal and vegetable oils come from every clime and enter into our daily life in unsuspected

Ewing Galloway

Grove of producing olive trees over 2,000 *years old, near Seville*

Ewing Galloway

Prolific stand of long-staple cotton, San Joaquin Valley, California

as well as familiar ways. Popularly, they are thought of in connection with foods. The man in the street knows that his chop was fried in cooking fat which may have come from the South Sea Islands in the form of cocoanut oil, from Georgia as cotton seed oil, from the Mediterranean as olive oil, from Manchuria as peanut oil. But he does not know how these products enter into the shaving powder he uses, the shoes he wears, the box of candy he buys for his best girl.

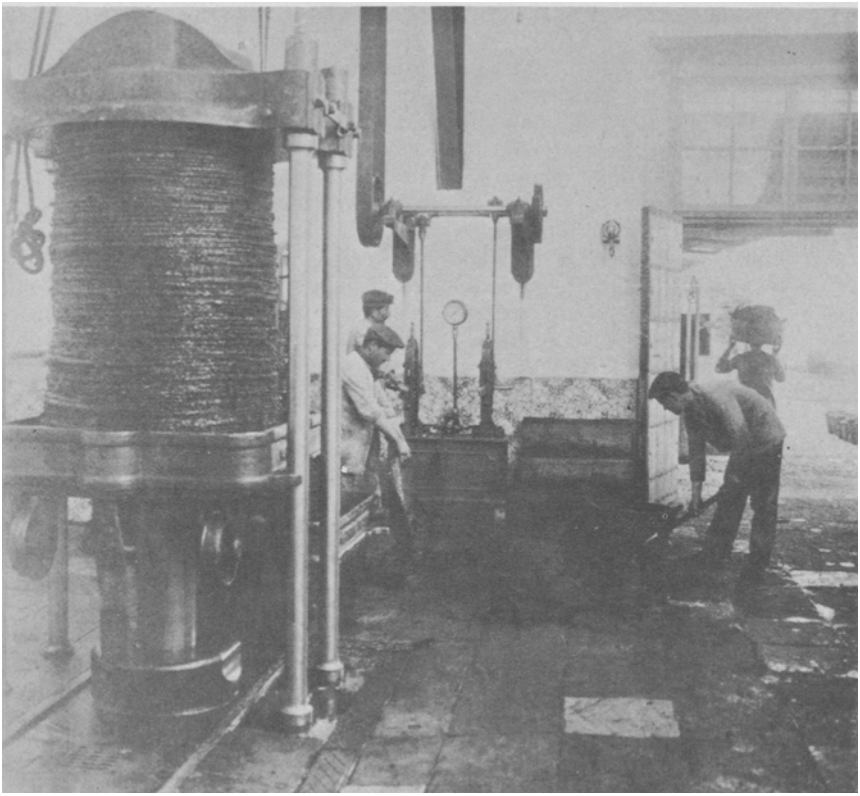
In "Creative Chemistry," Edwin E. Slosson, speaking of the vegetable oils as "solidified sunshine," gives the following uses for cottonseed products alone: Oleomargarine, cooking oil, salad oil, compound lard, setting olives, packing sardines, soap, washing powder, putty, roofing tar, linoleum, oil cloth, insulating, water-proofing paint, cotton rubber, artificial leather, fulling ware, candles, black grease, nitro-glycerine, miners' oil, substitute for sweet oil, medical emulsions, cosmetics. This is only one product of the industry, probably the best known, and it is doubtful if all the uses have been enumerated in the author's list.

As an illustration of the industry's ingenuity, Mr. Slosson tells the story of "blue bottle fly" oil, which was produced by the Germans during the war shortage of fats. They conscripted the blue

bottle fly and set it laying eggs by the billion on fish refuse. A few days sufficed to raise a crop of larvae which yielded forty-five grams per kilo of a yellow oil. It was probably used for explosives, though as Slosson points out, properly purified it would be as nutritious as any other oil—to one who had no imagination.

The world's search for new vegetable fats began as the result of a growing shortage of animal fats. This shortage is permanent. Man is using more fats and oils every year as food, and in the industries. One after another, new sources are being found and extraction put upon a successful commercial basis. There are other sources which have yet to be made profitable, and still others to be discovered. Great things have been done in production, but greater are to follow. And greater things, too, will follow in the industrial application of these products.

We are now waking up to the fact that important contributions have been made to the range of raw materials available for the manufacturer and chemist by various oils and fats. Each new addition to these products may have peculiar properties that will make it applicable in unexpected and unforeseen



Pressing ripe olives for oil, Seville, Spain

ways. Regardless of cost, it may be technically indispensable for some given purpose.

It is probably because the industry from the productive standpoint has been developed piecemeal in different parts of the world, by different groups of men, that so little has been done to make its products better known. Producers have not had the time for thorough technical research directed to finding out what is in their products, and how they may be used. The industries that consume them, as well, have lacked time for technical research in former years.

Take soap-making as a typical example. A few years ago, it was a rule-of-thumb craft, controlled by observation only, and in no way aided by the skill of the chemist or physicist. The ever-growing increase in demand for soap, and the encroachment upon the soapmaker's raw materials by other manufacturers, made it necessary to send the industry to college. The soapmaker had been throwing his glycerine away. He learned how to save it as raw material for explosives, medicines, confectionery, cosmetics and other purposes. As the solid fats were taken away from him, he learned to use the soft oils by catalytic hydrogenating processes.

Another new use of organic oils, dramatic in its effects upon a great industry, is in the separation of metals by the flotation process. It was only yesterday that mining engineers discovered that oil and an acid re-agent added to the water with which the particles of metal were separated from dross, and churned up into a bubbling frothy mixture, increased the recovery of metal from sixty to eighty and even ninety per cent. Immediately the question rose: "Which is the best oil?" and technical men have been at work on this problem ever since. The properties of different oils, giving the greatest yield from metals of different kinds, and from ores from different mines; as well as questions of cost, enter into the problem. Hundreds of different oils have been tested, and a great new market created for those that give the best results. From one-third of a pound to a pound of oil are needed to the ton of crushed ore. These oils are divided into "frothers" and "collectors." The pine oils are good frothers, while coal tar and its various derivatives are good collectors. In a general way, mining men say, oils of vegetable origin give the best results on zinc and lead ores, while mineral oils give better results on copper ores. Among the organic products used are pine oils, fir oils, wood creosotes, eucalyptus oil. In Australia, where the cost is not too great eucalyptus oil is used.

Organization is one need of the industry. Research is another. Salesmanship is needed, not only for its products, but to sell itself as an industry. In this country, thus far, united action by the different producing branches has been chiefly political, for protection against cheap-labor products from other countries. But growth must ultimately bring united action in other matters.