Philippine Copra and Coconut Oil

Copra Production Methods Remain Primitive, Although Modern Machinery Has Been Applied in Crushing Plants

By GEORGE W. HIPP*

The coconut palm supplies natives of the Tropics with food, drink, shelter and many other necessities.

PERHAPS no tree is so little known generally, yet is so vitally important, as *Cocos Nucifera,* the coconut palm. There is hardly another tree to be found that has such manifold uses. For centuries, the coconut palm has been the greatest single factor in the existence of tropical natives. It furnishes them with food and drink, their huts are made from its wood and leaves, their clothing also from its leaves, and utensils and fuel from the covering of the nut meat. The dried meat, or copra, gives them a commodity for trade, thereby a source of income.

It is the copra, and the oil extracted from the copra that plays such an important part in our own civilization, in that it in turn furnishes us with food, toilet and household soaps, bakery products, confectionery, and feed for our cattle. The fibrous covering of the fruit also has its uses in weaving floor coverings and other household articles. A Singhalese proverb states truly that the coconut palm serves 99 different purposes, and that the hundredth will also be found.

The coconut palm is found in great abundance in Southeastern Asia and Oceania. It is also native throughout the American tropics but in scant abundance, insufficient for most

* *Spencer Kellogg & Sons Sales Corporation.*

commercial purposes. The tree is not indigenous to Africa where the oil palm, from which palm oil and palm kernel oil are obtained, flourishes. Here it is well to differentiate between the coconut palm and the oil palm. They are entirely different species, do not grow in abundance in the same localities, and their oils are not at all similar in characteristics. While they can be used one with the other, they cannot be entirely substituted for each other.

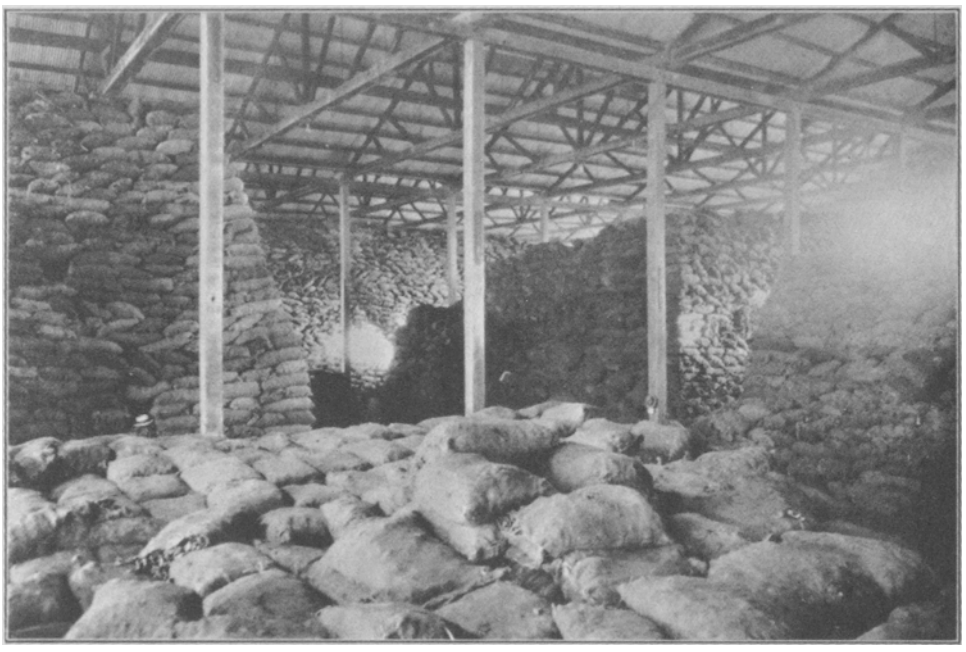
The coconut palm thrives best between the two tropics, in a high temperature, ample sunshine and a heavy, evenly distributed rainfall. The tree does not store much moisture, therefore it flourishes best where the roots can reach the water and where it has the additional advantage of the seawinds. It is essentially a lowland, and particularly, a coastal plant. Sunlight is of extreme importance, as is also good soil drainage.

Ordinarily it takes from five to eight years for a coconut palm to bear fruit, and under average conditions, the tree reaches full bearing about the tenth year. While the life of the tree is not definitely known, it is estimated at between seventy and eighty years. Naturally, toward the end of the tree's life, its bearing diminishes. The period of bearing is, perhaps, sixty years. The tree forms but one vegetative bud during its life, and from this the branches develop, from twelve to nineteen a year. The nuts develop in the axils of the branches. In certain sections, climatic conditions governing, bearing trees produce varying quantities annually. Trees in some localities have been known to produce as many as two hundred nuts, but that is a rare exception.

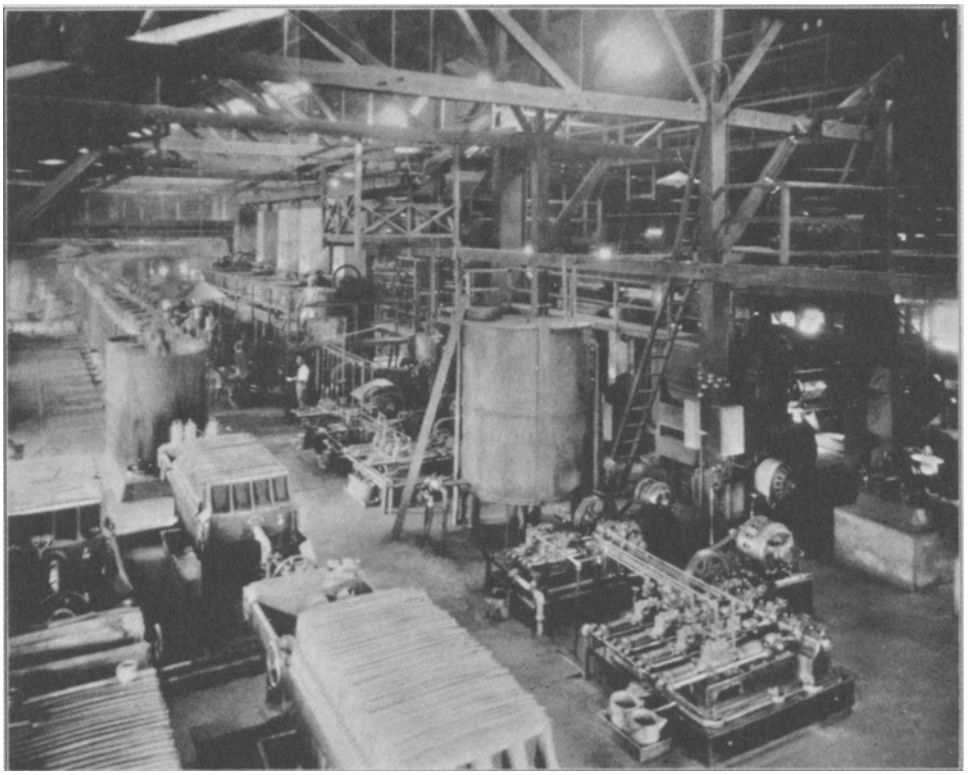
The coconut crop must be harvested at various times during the year as the nuts mature. The nut is of slow development and takes about a year to ripen. The mature fruit has a smooth, yellowish outer covering, underneath which is a fibrous layer or husk up to two inches in thickness. The seed, or kernel, is encased in a hard shell in a cavity of the husk and in this shell is the meat, about one-half inch thick. It is spherical in shape and hollow inside, is perfectly white and has a taste something like almonds. As long as the fruit is not ripe, the hollow contains a sweetish liquid, or coconut milk, which in the course of maturity becomes a fleshy pith. The meat of the coconut palm when dried becomes copra, and this is the source of coconut oil. This product has become one of the most important of the Philippine Islands, which supply the greatest share of our needs.

Primitive Production

COPRA production in the Philippines is still in a rather primitive stage. Plantation cultivation does not exist on a large scale, and the quantities thus obtained are far in the minority when considering the entire production. For the most part, copra is produced by



A Manila warehouse for copra in bags, well-filled with the produce brought in by natives



Interior of a modern copra mill at Manila, showing hydraulic presses, cookers, filter presses, hydraulic pumps and accumulators

natives operating in a meager way. These natives cultivate perhaps a few acres. The bearing trees require little or no attention except in gathering the crops, and therefore the native has time for other pursuits, such as truck farming or working for others in the better organized productions of rice, abaca (hemp), tobacco and corn.

When the fruit is ripe, the nuts are taken from the husks and split in two, usually by axes. There are two generally used methods of drying the copra, sun-dried and smoke-dried. In those sections where plenty of sunshine can be expected, the meats in the half shells are placed on racks and left in the sun to dry. In the course of drying the meat separates from the shell. The meat is sufficiently dried or cured in from three to five days after which it is packed in sacks and is ready for the market.

Smoke-dried copra is produced in those sections where there is insufficient sunshine. The preparation for drying is the same as for sun-dried. The meats in the shells are placed on a bamboo grate under which is built an oven. The discarded husks are used for fuel. The meat is dried by the hot air and smoke from the oven and is cured in about twelve hours.

The cured copra in bags is taken by the natives to a trading station and sold or traded for other merchandise, or both. The trading stations gather an accumulation and sell or trade it to dealers in the large concentration centers, where it is sold to the Philippine mills for crushing into coconut oil, or for export, usually to crushers located on the Pacific Coast of the United States.

Since credit and banking facilities are unknown to the native copra producers, the medium of exchange is cash. This follows all along the line, and when a crusher contracts for a quantity of copra, he has to cover immediately with cash. Copra is purchased on contract for shipment from interior concentration points. It ordinarily takes thirty days after the copra is bought and paid for before it is available either for export or for crushing at Manila or Cebu, where the Philippine crushing plants are located.

Modern Crushing

WE NOW come to the parting of the ways. East meets West and copra comes under

the spell of a highly specialized and scientific development. The East has done its part in giving to the world its product. It has labored under many difficulties with the crudest methods. The call of the West has been answered with a challenge to carry on and to fulfill its part in making available the many benefits which the product has to offer.

The West's acceptance of that challenge, the invention, system and organization it has built to meet it, forms another story equally interesting in that it transforms the old to the new, the crude to the modern, the East to the West. Perhaps the greatest benefit is in the strong bond of mutual understanding and interdependence of two peoples, far different in most of their ordinary modes of living, economically, politically and socially.

The uses for copra, whether exported from or crushed in the Philippines, are the same. Therefore, since we have followed its production there, we shall visit one of the large crushing plants at Manila. When copra is received, it usually contains more moisture than is considered satisfactory for use. It is stored for further drying in large, airy bodegas (warehouses) about thirty days, when it is ready for its conversion into coconut oil.

The copra is fed into a machine which breaks it into very small pieces. It is then ground into a coarse meal and steam-cooked about three hours, then it is passed through the expellers for expression of the oil. The residue, or cake, is broken and ground into a fine meal, again steam-cooked and fed into a hydraulic press which compresses the cake, extracting further quantities of oil. The oil is run through a filter press and then into large storage tanks for shipment to the United States. Copra contains from 60 to 70 per cent of oil. The cake is broken, bagged and sold for cattle feed, principally to European countries.

Transportation again assumes command, and the West demonstrates the magnitude of its operations. For many years, the coconut oil shipped from the Philippines was carried in the ballast tanks of passenger and freight steamers. These tanks are usually placed in the sterm and bow of the vessel and are filled with seawater when no cargoes are obtainable. Naturally, it is of interest to the steamship companies to fill these tanks with oil, as it furnishes them with revenue and ballast at the same time.

Bulk Shipments

ONE large company operating two crushing plants at Manila has placed a fleet of tankboats in service between its Manila mills and United States refineries. These tankers have compartments, each holding about 1000 long tons or 2,240,000 pounds of oil. The capacities of these tankers is around 7000 long tons. The sailing time of passenger ships from Manila to New York or New Orleans is from 65 to 75 days, depending on the number of and locations of other ports of call. The tankboats plying direct take about 55 days. If the steamer has European or Mediterranean ports of call, the Suez Canal route is used. Direct sailings to the eastern seaboard of the United States are made via the Panama Canal route.

For the oil in the storage tanks at Manila, there is another operation before the steamers can be loaded. Most of the crushing plants are located on the Pasig River, which runs through the city of Manila. There are no piers at which the steamers may tie up, as the shallowness of the stream does not permit. Therefore the oil must be loaded into tank barges and lightered to the steamers in mid-stream. The oil is run through a scale, then pumped through pipelines to the tank barges, floated to the steamers and pumped into ship's tanks.

Before a steamer can be loaded, very careful examination and inspection of its tanks must be exercised. They must be absolutely clean and free from odors of other cargoes that may have been in the tanks. They must positively be tight and every rivet tested to be certain of no leakage of seawater into the tank or oil from the tank. They must be steam-coil equipped, as the coconut oil becomes solid at a temperature lower than 72 degrees F. and must be liquefied by heating for unloading in Northern waters.

Coconut oil is very sensitive in its nature and quickly becomes contaminated if exposed to outside odors. It will readily be understood why extreme care must be exercised in every step of its production, storage, transportation and refining. On arrival at the discharging port of the United States, preparations started while the oil was enroute begin to function. The first procedure is to take samples from each tank and subject them to rigid laboratory analyses to determine whether the quality has been impaired during its long journey. Satisfied on this point, the oil is pumped into scales to determine the landed weights, and then into tankcars or tankbarges for shipment to its purchasers.

Some large coconut oil operators, located on seaboard, have the ships discharge at their own plants, and after weighing the oil, pump it directly into their storage tanks and hold it subject to the call of the trade.