Sea Bob Fishery of the Guianas

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"Assuming demand in other countries increases at least as rapidly as U.S. demand, the world's estimated harvest potential of shrimp and prawns from known populations may be reached by 1980." So wrote Donald P. Cleary, BCF economist, in Commercial Fisheries Review, March 1970.

Evidence of new shrimp sources being tapped are illustrated graphically by the increases during recent years in shrimp harvesting in Northeast Pacific and Northwest Atlantic. The catch of small shrimp in Alaska has tripled since 1965. Off New England, the shrimp catch has doubled each year for the past 4 years. There is some reason to speculate that the production of shrimp from existing sources may be reaching its upper limit.

There are some unconventional supplies that never have been fished heavily in some parts of their range. These include certain shrimp inhabiting great depths of the ocean basins and, somewhat surprisingly, at least one species found near shore along much of the tropical and semtropical shoreline of the western Atlantic. A species in the latter category is the sea bob, Xiphopeneus kroyeri, found in the Atlantic from southern Brazil to Cape Hatteras, North Carolina.

Compared to other shrimp species, the sea bob is small. Frequently, it is found mixed with large quantities of small fishes; separating shrimp from catch is laborious.

Significant fisheries for sea bob exist in Brazil. Neiva and Wise (1964) reported a catch there in excess of 6,000 metric tons (heads on). Neiva (1968) indicated that landings in 1965 tripled those of 1964. Most of the catch in this fishery, centered at Santos, is made by trawls. In the United States, there is some trawl fishing for sea bobs, primarily in Louisiana. Landings there averaged about a half-million pounds annually from 1965 to 1967. The publication, "Survey of the Sun-Dried-Shrimp Industry of the Northern Gulf of Mexico," (Love, 1967) describes the fishery in Louisiana. Sea bobs also are taken in Central and South America.

FISHERY IN THE GUIANAS

The "Guianas" (fig. 1), including Guyana (formerly British Guiana), Surinam (Dutch Guiana), and French Guiana all have fisheries for sea bobs.

Although sea bobs are the predominant species taken, other varieties of shrimp, known locally as "white-bellies" (P. schmitti), are found in the catches in varying quantity. Accurate data on production by species are not generally available. Croker (1967) stated that Guyana production in 1956 was about 800,000 pounds (heads on), but estimates were that 4 to 5 million pounds could be harvested if a suitable market were found. In Surinam, 1956 production was more than 1 million pounds, and 5 to 6 million pounds can be produced annually.

More recent figures have been gathered for Surinam and French Guiana. From 1960 to 1968, Surinam production averaged 1.2 million pounds per year. In French Guiana, production in 1963 to 1965 averaged about 130,000 pounds a year.

A definite seasonal trend can be noted from available information on landings. In French Guiana, there are no significant landings from December to April; fishing there is sharply curtailed due to a reduced catch rate. A similar cycle is evident in Surinam; figure 2 illustrates relationship between rainfall and monthly variations in landings. The peak of the Guianas' fishery occurs in summer. A comparable phenomenon exists off Brazil, where top landings are from December through June during southern summer. In Brazilian fishery, Neiva and Wise

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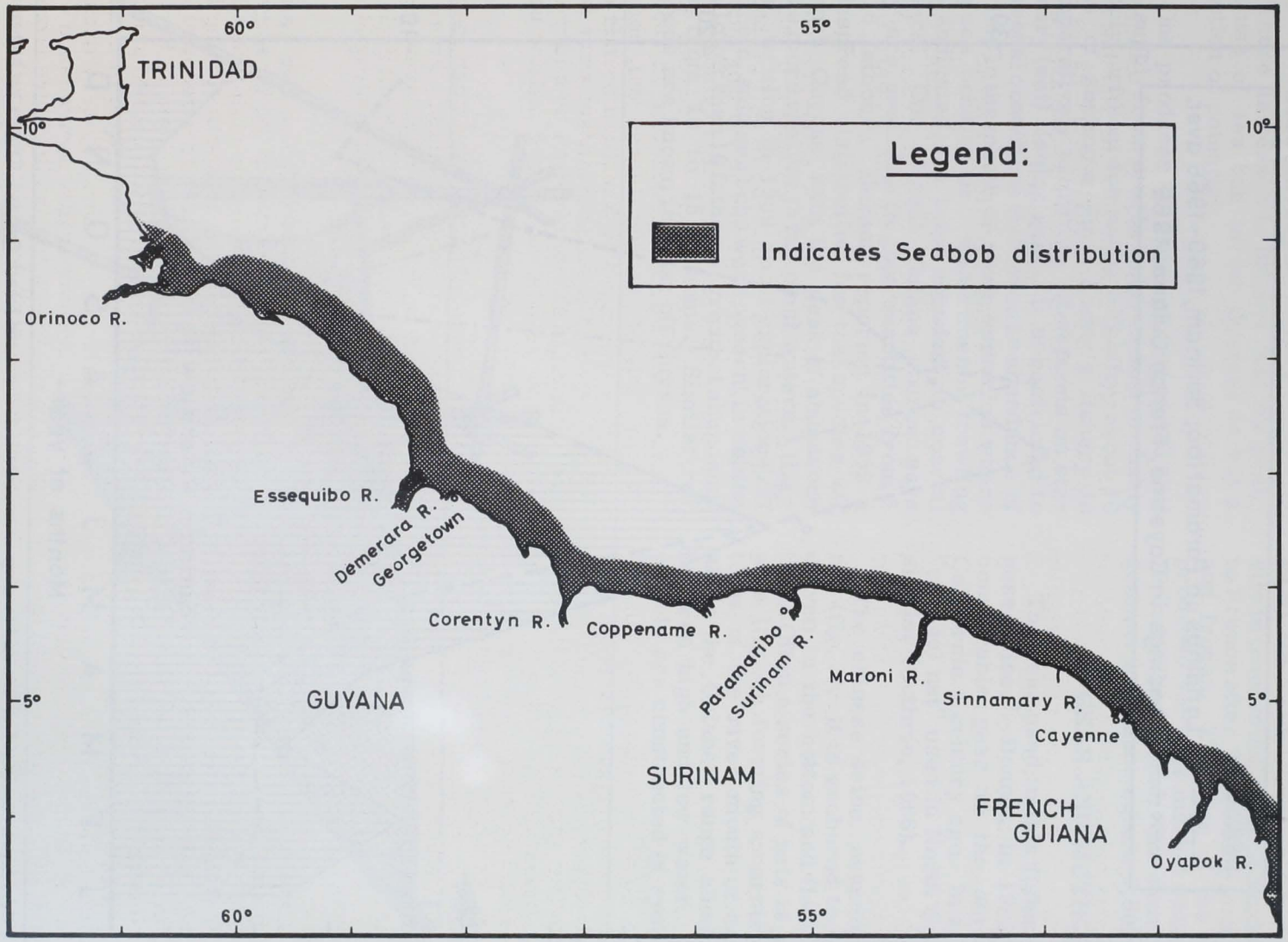

Fig. 1 - The Guiana coast of South America. Shaded portion indicates approximate range of sea bob, Xiphopeneus kroyeri, a small shrimp.

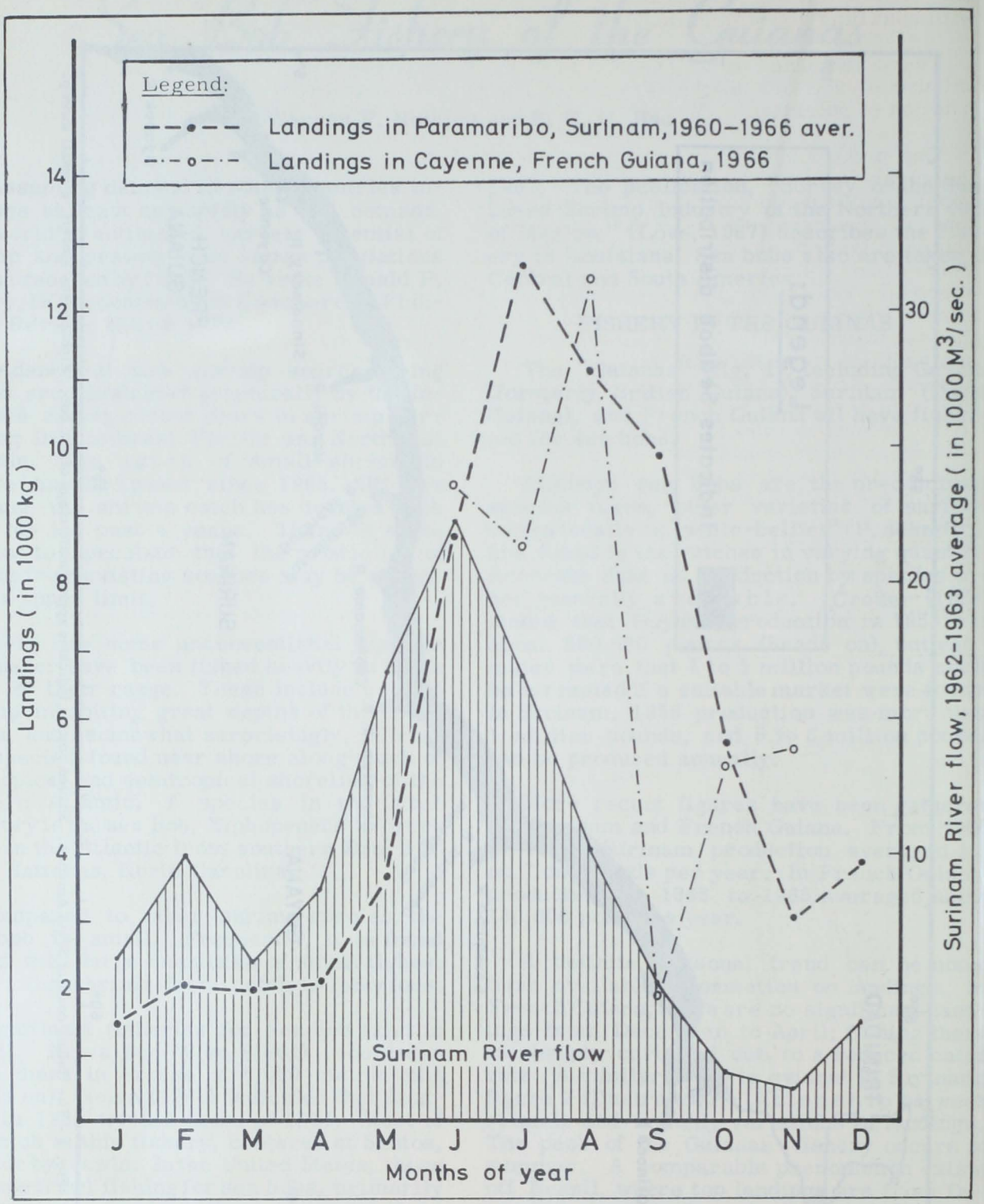

Fig. 2 - Correlation between river flow and landings of sea bobs in Surinam and French Guiana. Catches are highest during periods of maximum river flow.

suggest that this high catch rate is associated with spawning concentrations.

There is reason to believe that the present use of sea bob in the Guianas is but a fraction of potential.

One producer in Cayenne suggested that the supply from nearby waters could probably supply, without too much difficulty, about 10 tons of shrimp a day. Today's fishery is comparatively primitive. It depends on stationary (set) fishing gear. It is restricted to seasonal conditions that favor an abundance of shrimp in the mouth of river estuaries where the sea bobs occur. Experimental trawling has indicated sea bobs abundant in coastal waters. One French Guiana source says they are available in good quantities from 5 to 16 fathoms. Durand reported in 1959 a widespread distribution for the species off French Guyana with the peak of abundance in the more shallow (5 fathoms) waters. Higman, writing in 1959 about explorations off Surinam, said sea bobs were present in depths shallower than 16 fathoms; greatest abundance was from 10 to 15 fathoms. Similar resources are known to exist off Guyana.

In Guyana and Surinam, most production is consumed locally; exports are insignificant. In French Guiana, however, the opposite is true: much of the production is shipped to France after first being cooked, packaged, and frozen. The size of the whole shrimp produced for this market varies from about 70 to 100 per pound. One source reports the demand in France equals 3,000 tons a year.

GEAR AND METHODS

The gear used in this fishery is the "chinese seine." Bonnet, in 1933, described a comparable gear in the shrimp fishery of California a century ago. In some ways, the "channel net" used in North Carolina also is similar (Guthrie, 1966).

The chinese seine, essentially, is a bag net (fig. 3). It is anchored to wooden stakes driven in the bottom and fished by tidal action. Often a series of nets is fished side by side (fig. 4), forming a barrier across portions of the river mouth or estuary. Tides along the Guianas range about 8 to 12 feet between high and low water. The "seines" or nets are constructed of synthetic webbing

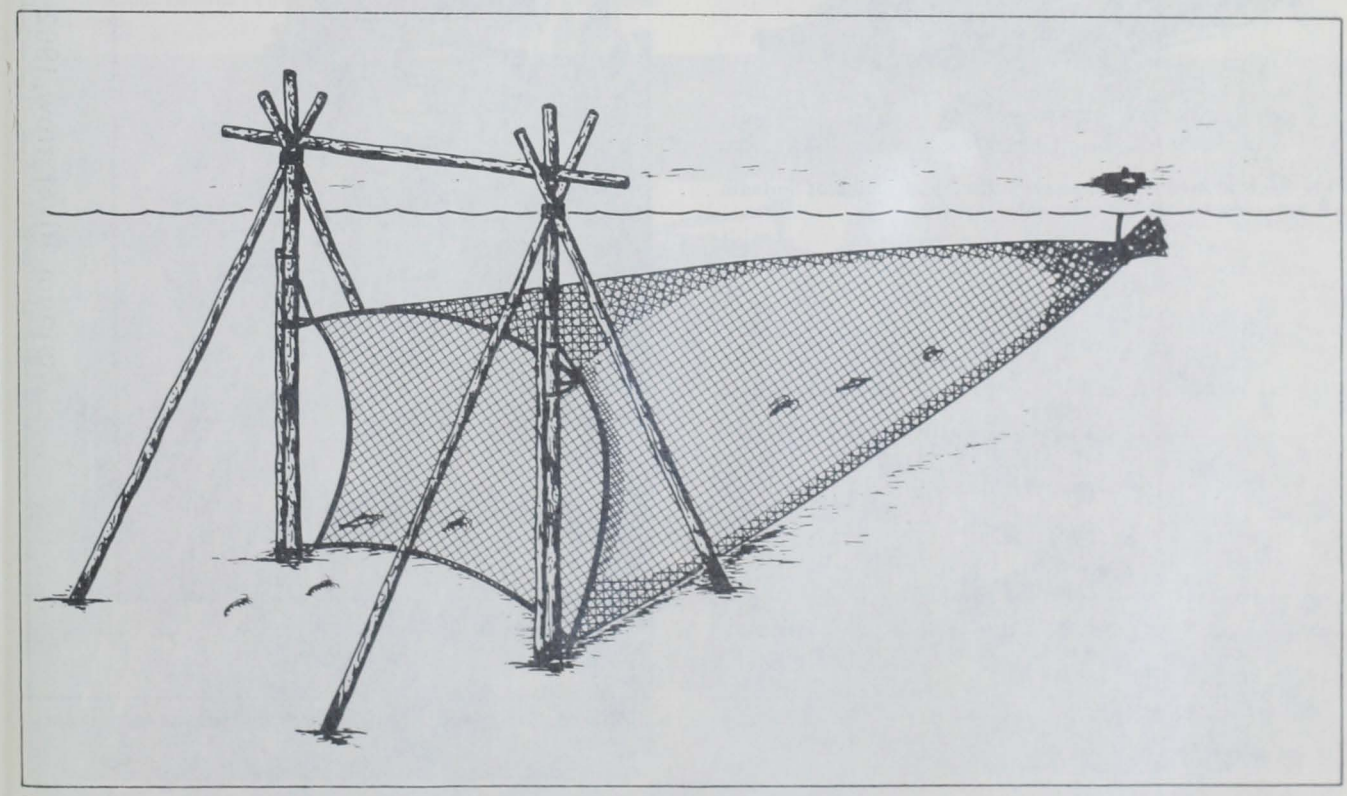

Fig. 3 - Diagram of a "chinese seine," a type of bag net used to fish for sea bobs in the Guianas. These nets are set near mouths of estuaries and, sometimes, are fished in groups of 6 or more units. Some fish also are taken.

varying from up to 10 inches (stretched mesh) at the mouth, and tapering to $\frac{1}{2}$ to $\frac{2}{3}$ of an inch in the bag or cod end. The overall size of the nets ranges from 20 to 25 feet wide by 10 to 20 feet deep at the mouth, and 60 to 80 feet long.

A bateau or canoe-type boat (figs. 4 and 5) of up to about 16 feet is used to tend the nets (2 to 10 in number of units) and to transfer catches ashore.

The usual sequence of operations is:

1. At fishing site, the net is streamed into the current caused by tidal flow (fig. 6).

2. The forward (mouth) portion of the net is retained at bow of boat.

The footrope holding poles (fig. 7), with either vine or chain rings, are put to one side of boat.

Fig. 4 - Boat used in chinese seine fishery at mouth of Surinam River. Most boats are outboard powered.

Fig. 5 - Boat used in chinese seine fishery near Georgetown, Guyana. In background, part of string of chinese seine nets near mouth of Demerara River.

Fig. 6 - Fisherman overhauling chinese seine net during setting procedure. Nets are fixed to stakes and fished by tidal action. Catches are taken from net at slack tide.

Fig. 7 - Pole with ring made from vines used to hold bottom of net to fixed stakes. In background are nets taken ashore for overhaul.

3. The ring of footrope holding pole is slipped over fixed stake, one holding pole for each lower corner of the net (two). The lower corners of the net are then fixed individually, one at a time, to each holding pole; they are then submerged and driven to the bottom. The top of each holding pole then is affixed to respective fixed stake.

4. With mouth of net then spread between fixed stakes, the cod end is tied and set into water. A float is affixed to cod end for recovery purposes.

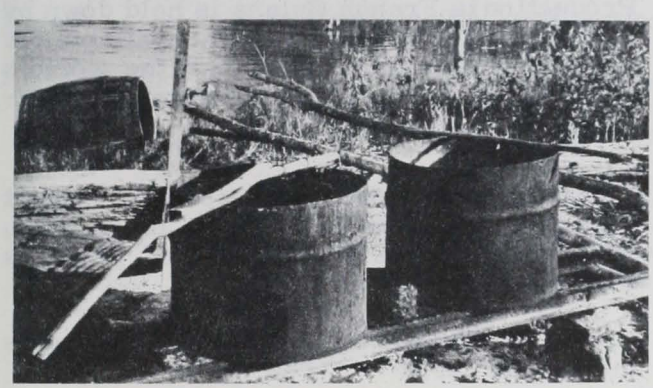

Fig. 8 - Cut-down oil drums are used to boil shrimp after they are brought ashore. The sea bob shrimp are cooked in a brine solution.

At appropriate stage of tide (slack water), the cod end is retrieved by the floatrope, and the catch emptied into baskets in the stall. Then, usually, the net is reset to fish on opposite tide (flood vs. ebb).

In Surinam, one net can be expected to produce about 65 pounds of shrimp per ebbing (outgoing tide). Some fishermen fish up to a dozen nets which, when fishing is good, can be expected to capture over 500 pounds per tide.

Some Processing Is Done

Some processing is involved in preparing shrimp for "market." In Guyana and Surinam, the shrimp are boiled in brine (fig. 8) by fishermen or their families. The shrimp then are sun-dried on frames (fig. 9), and the "meats" separated from the "heads" much in the manner wheat kernels are separated from chaff. The product (fig. 10) is relished by East Indian residents of both countries as a condiment for mixture with other foods or simply rice. Conversely, the procedure in French Guiana involves cooking and freezing (heads on) for shipment to metropolitan France.

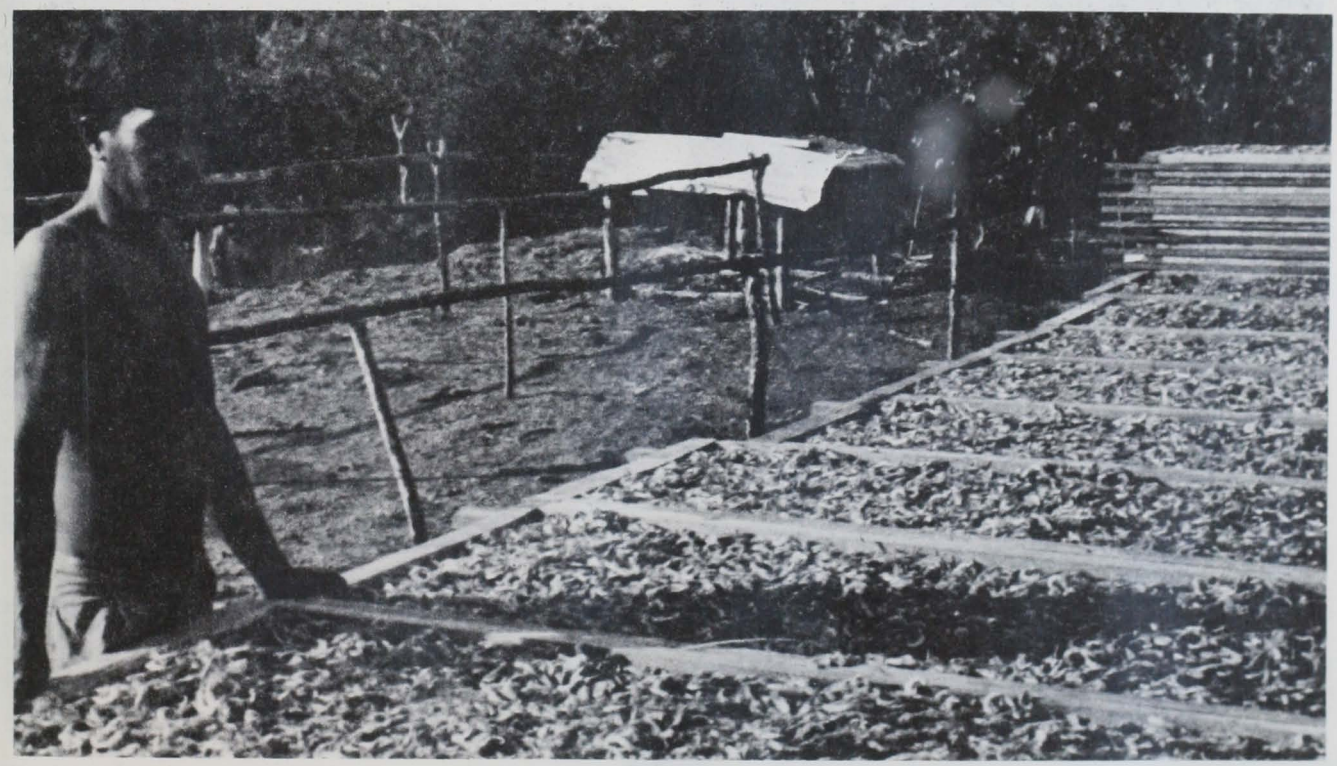

Fig. 9 - Shrimp drying in sun on frames. After shrimp are dried, meat is separated from head by sifting. The inedible portions are valued as feed for chickens and other animals.

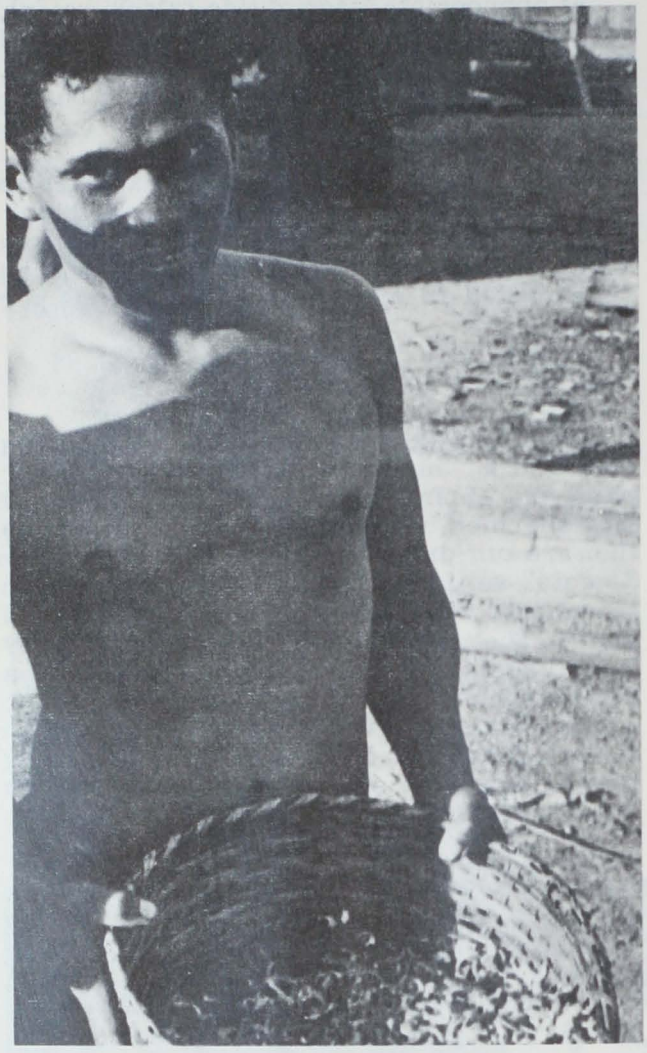

Fig. 10 - After drying, the sea bob shrimp shown here are ready for market. The dried product is sold for over one (U.S.) dollar per pound.

Part of the solution may be found in using specially designed trawl nets capable of eliminating most fish catch but retaining shrimp. Part of problem in trawling for sea bobs is capture of large quantities of undersized "trash fish" along with sea bobs. The fish make it difficult to pick out shrimp--besides degree of damage to tiny shrimp while still in the cod end due to the heavy pressure.

Much technological development is needed. Production in French Guiana is held down by the limited fresh water readily available for mechanical peeling. In one of the world's "wettest" parts, this probably can be overcome.

Processes now being developed might permit separation of shrimp "meat" from sea bobs for use in specialized products where only a fraction is shrimp.

The next decade will witness developments in sea-bob use.

POTENTIAL

No reliable estimates are available that project possible landings from this fishery. About three million pounds are taken by stationary gear at less than half the available fishing sites. Fishing is conducted within a very limited part of the sea bob's range. These factors suggest that an increase by a factor of ten times or more might be anticipated by pursuing more aggressive fishing techniques (trawls).

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