CAPTURE, TRANSPORT AND DOMESTICATION OF ADULT MILKFISH, CHANOS CHANOS*

by

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Abstract

Methods used in the capture, transport and domestication of adult milkfish are described and illustrated.

Introduction

The difficulties of domestication of adult milkfish, Chanos chanos, and the importance of overcoming this obstacle before achieving large-scale spawning and fry production from captive animals, have been documented (Anon., 1974; Oceanic Foundation, 1975; and Schmittou, 1975). This problem was solved in Hawaii in 1975 (Madden et al., 1976 and has now been successfully overcome in the Philippines.

A description of our methods of capture, transport and domestication of adult milkfish, locally called sabalo, from the wild, forms the basis of this report.

Methods and Results

During the present fishing season, November, 1975 to June, 1976, four otoshi-ami were installed along the northwest coast of Antique Province (Kumagai et al., 1976). One of these was located adjacent to the laboratory site at Mag-aba; one at Bulanao, 10 km west of Mag-aba; one at Libertad, 17 km west of Mag-aba, and one at Bagaas, 4 km west of Libertad. In addition, two fish corrals were located at Hamtik, 135 km south of Mag-aba. The otoshi-ami and the type of fish corral installed at Hamtik have been described (Manacop, 1976).

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After capture in an otoshi-ami or fish corral (Plates 1, 2, 3 and 4) the sabalo were transferred by large dip net, into the holding-transport cage which was in an upright position (plates 5 and 6). The open draw-string end of the cage was then secured. The frame of the 10' x 5' (3.5m x 1.52m x 1.52m) holding-transport cages (plate 7) was constructed of 2" (5.08cm) PVC pipe and fittings with knotted 1/2" or 3/4" (1.27 or 1.9cm), stretch nylon netting and its buoyancy could be adjusted by filling it with water through a stoppered 2" (5.08cm), PVC Tee.

After the sabalo were in the cage, the cage was rotated 90° and lashed to the frame of the outrigger of the pumpboat (plate 6) and brought close to the shore at a speed of 1.5 knots. It was then hand-carried to water of approximately 50 cm deep.

When the sabalo catch was in the otoshi-ami at Mag-aba the cage was brought to the shore near the laboratory (plate 9). One team member then entered the cage carrying a 1.5 m long plastic bag made of 0.6 mm plastic tubing 81.3cm in circumference knotted at one end (plate 10). The plastic bag was then filled with water, the fish guided into it and the bag with its open end held securely closed, floated out of the cage on a hammock (plates 11 and 12). Two men then carried the hammock while a third man kept the open end of the bag securely closed (plates 13 and 14). The hammock was then placed beside the holding tank. The bag with fish and water was then lifted and passed to two men waiting inside the tank, who released the fish (plates 15, 16, 17, 18 and 19).

When the sabalo catch was at one of the other 3 sites, the fish was transferred from the holding-transport cage to a water-proof canvas tank on a pick-up truck (plate 20). A flow of oxygen was maintained in the tank during transport to Mag-aba, where the fish was placed in a plastic bag with water and transferred to the experimental or holding tank.

The holding facilities at the laboratory site consist of 2, 4 and 12 m diameter tanks 1.5 m deep and a lagoon of which about 0.3 ha have been fenced in. The tanks are modified backyard swimming pools fabricated from water-proof canvas with one 4" (10.16 cm), drain centered in the bottom and 2" (5.08 cm) outlets, 6" (15.24 cm) above the bottom, on each side of the tank.* The tanks were supplied with continuously flowing water and aeration. Water levels are maintained at 50 to 75 cm.

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*Manufactured by Basic Indusia, Inc. Pasong Tamo St., Makati, Rizal.

Results

From 3 November 1975 to the present, 12 May 1976, a total of 259 sabalo were captured in the three otoshi-ami located at Bagaas, Libertad and Mag-aba and the two fish corrals at Hamtik. No sabalo were captured in the otoshi-ami located at Bulanao. The catch statistics together with mean weekly temperatures of the water from a depth of 5m at the Mag-aba otoshi-ami are illustrated in Fig. 1. Salinities of the water at 5m at Mag-aba ranged between 33.2 and 35°/oo from 1 December 1975 to 12 May 1976.

While sabalo were captured occasionally between November and March they were not captured in large numbers until early April at which time water temperatures rose above 26.5°C. This is in agreement with the findings of Kuronuma and Yamashita (1962) who showed that milkfish fry occurred in the coastal waters of Eastern Vietnam only after the water temperature rose above 27°C.

Of the 259 captured sabalo, 100 were released from the otoshi-ami and 18 died during capture (Table 1). Fifteen fish were badly injured and descaled during capture, four of these fish died during t truck transport and nine died later during domestication. No fish were lost during cage transport to the shoreline. During the catch at Bagaas on 6 May, 23 fish were placed in the cage and transported in excellent condition to the shore. On being carried into the shallow shore waters the approaching cage was greeted by 100-125 cheering children and the fish became excited. The children were fascinated by the excited fish and commenced rythmic shouting; the fish were examined and placed in the holding tank. Two of these fish had broken jaws, one had a ripped operculum, two had deep gashes in the top of their heads and ten were badly descaled. Thirteen of these 23 fish died within three days of capture.

During the first truck transport on 27 March from Hamtik, diluted sea water (20°/oo chilled to 18°C was used. The two fish being transported died within half an hour of loading into the tank on the truck. On the next fish transport from Hamtik on 4 April, diluted sea water (25°/oo) chilled to 24°C was used and the transport was successful. Diluted sea water (18-26°/oo) with no chilling was used in all truck transports until 15 April. The temperature of the water ranged between 29 and 32°C and there were on mortality. Non-diluted sea water (34°/oo) at ambient temperatures (29-32°C) was used in the truck transport on 22 April and all subsequent transports. Three fish were lost during the truck transport from Bagaas on 9 May due to a malfunction in the oxygen regulator.

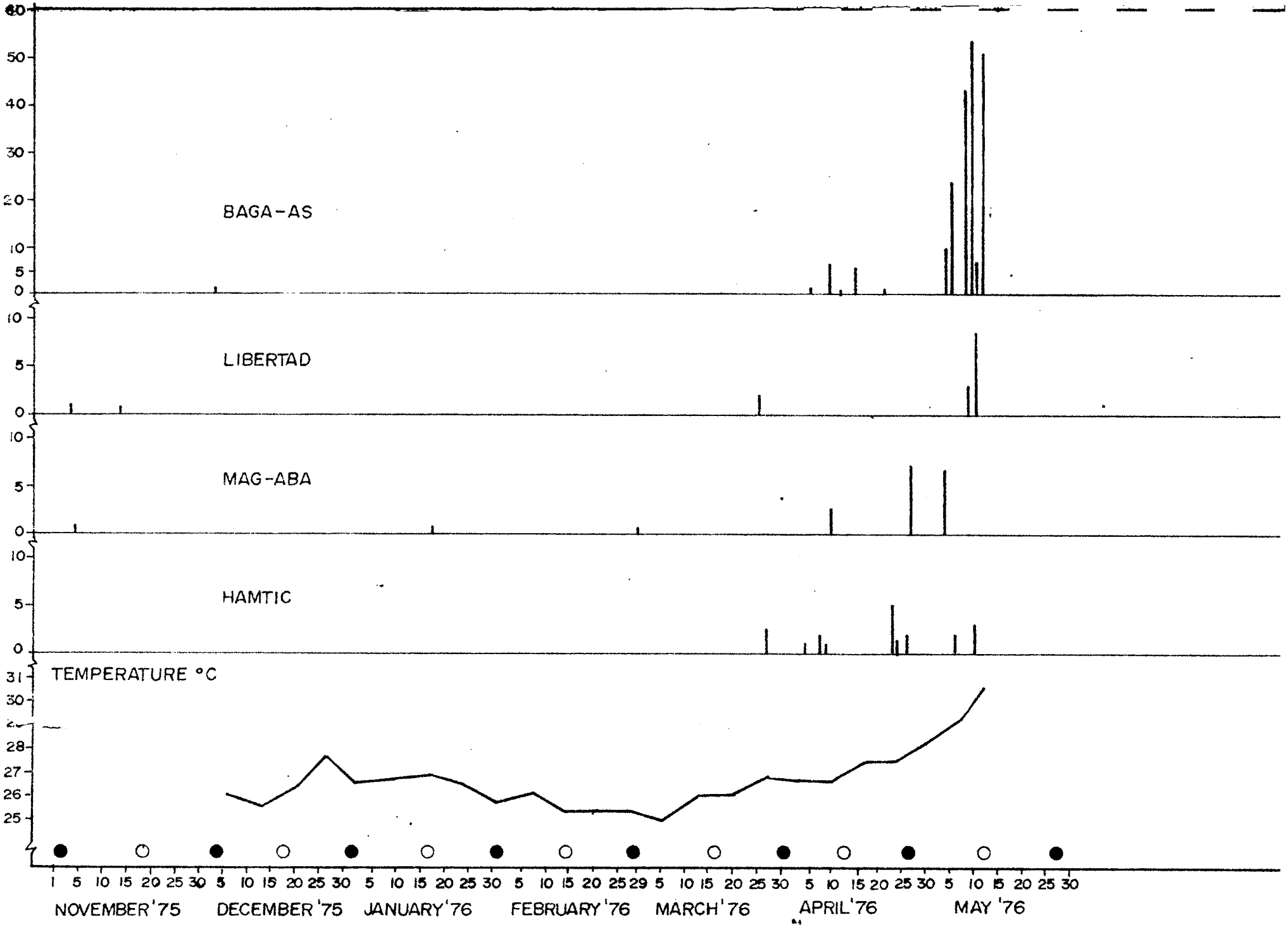

Figure 1. Adult milkfish captured from Otoshi-ami and two fish corals in Antique Province November 1975 to May 1976.

Table 1. Balance sheet of the 259 adult milkfish captured in the three otoshi-ami located at Bagaas, Libertad and Magaba and two fish corrals located at Hamtik, Antique, from 3 November 1975 to 12 May 1976.

	Number of fish		
	which died	Released or still alive in tanks	Experimental fish transferred to lagoon
Died during capture	18	-	-
Released to sea immediately after capture	-	100	-
Died during transportation in truck	9	-	-
Badly injured during capture and cage transport	22	12	-
Domestication experiments - tanks	1	13	21
Domestication experiments - lagoon	10*	-	44 - 10
Spawning experiments	6	4	6
Domesticated fish released to sea by tagging team	-	3	-
			71 - 10
	66	132	61

*Specific origin of these 10 dead fish unknown - refer to text.

The first live sabalo was obtained on 4 November 1975 and due to lack of facilities at that time it was released into the enclosed portion of the lagoon. This occurred during the rainy season at which time the salinity of the top 50 cm was 32-34°/oo. This halocine was maintained throughout all tidal changes. Salinity of the lagoon had been previously determined daily for a week in late June, 1975. At that time there had been heavy rainfall and the salinity of the top 50-75 cm ranged from 5 to 14°/oo while the salinity of the water below this ranged from 26 to 32°/oo. This fish escaped from the lagoon in mid-March. The fish captured on 7 January 1976 was placed in a tank containing sea water, (34°/oo). This fish developed the typical opaqueness of the translucent adipose eyecover (referred to by Schuster [1960] as eyelid) and died 11 January. Twenty-three of the 35 fish captured after this date for domestication in the holding tanks, were maintained in diluted sea water, 18-22°/oo, for 10-16 days at which time the salinity was increased to 34°/oo. The adipose eyecover of these fish became opaque 2-3 days after capture, but this opaqueness disappeared after 9 days in captivity. The fish which died during domestication by this method were those injured during capture and cage transport as discussed above. Twenty-one of the 35 fish intended for domestication were captured on 4 and 6 May and were placed in the domestication tanks until 8 May. These 21 fish were then transferred to the lagoon and their fate is not known, as discussed below.

As soon as their eyecover cleared the tank-domesticated fish were observed to actively feed on diatoms and protozoans forming a scum on the surface of the water. Live zooplankton collected from the lagoon was then added to the tank once daily. These feeds were supplemented 3 weeks after capture with a twice daily feeding of a mixture of chopped fish and rice bran (300 gm rice bran/kilo chopped fish).

During April, three fish which had been domesticated in the tanks were donated to a tagging team for their use. Due to shortage of tank space, and because of the survival in the lagoon of the fish captured on 4 November, 6 fish from the spawning experiments of 4 and 6 May, 21 fish which had been in 20°/oo water since 4 and 6 May and 44 newly captured sabalo, which were believed to be spawned out females, were placed in the enclosed lagoon between 6 and 12 of May. Ten of these fish died between 9 and 12 of May and more have died since. It was determined on 12 May that the water salinity of the lagoon ranged from 29°/oo at the surface to 33°/oo at the bottom and no halocline was present. The unfortunate loss of these fish in the lagoon reconfirms the findings of investigators in Hawaii and those involved in the present study that brackishwater (15-22°/oo) is necessary for survival of adult milkfish during their first 10 to 20 days in captivity.

Between 15 April and 6 May, 16 fish were used in the spawning experiments reported elsewhere (Vanstone et al., 1976). Six of these fish died or were killed during experimentation and 4 were returned to the holding tanks where they were successfully domesticated and 6 were released in the lagoon.

Acknowledgment

The success of this and other milkfish studies conducted at Mag-aba, Pandan, Antique, could not have been achieved without the cooperation of Atty. Enrique Zaldivar and Mr. Rene Lorenzana, operators of the four otoshi-ami. We are indebted to these gentlemen and also to their fishermen for their assistance.

The dedication and untiring assistance of our colleagues at Pandan Station and at the Hamtik Sub-Station are acknowledged.

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Explanation of Plates

Plates 1 - 4	:	Capture of sabalo in the otoshi-ami.
Plates 5 and 6	:	Transfer of sabalo from the otoshi-ami to the transport cage.
Plate 7	:	The sabalo transport cage.
Plate 8	:	Attachment of transport cage with sabalo to outrigger of pumpboat.
Plates 9 - 19	:	Transfer of sabalo from transport cage at the shore to the holding tanks.
Plate 20	:	Transport tank on to pickup truck used for transporting sabalo long distance by road.

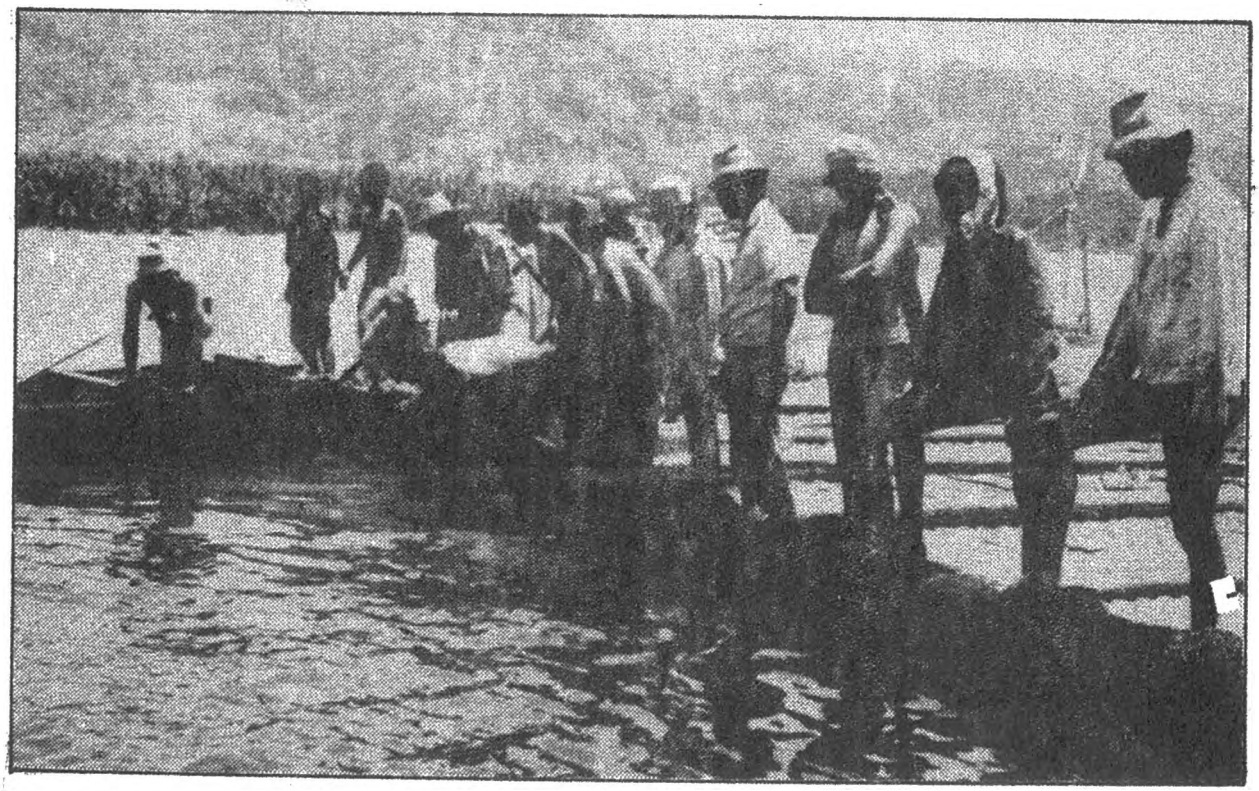
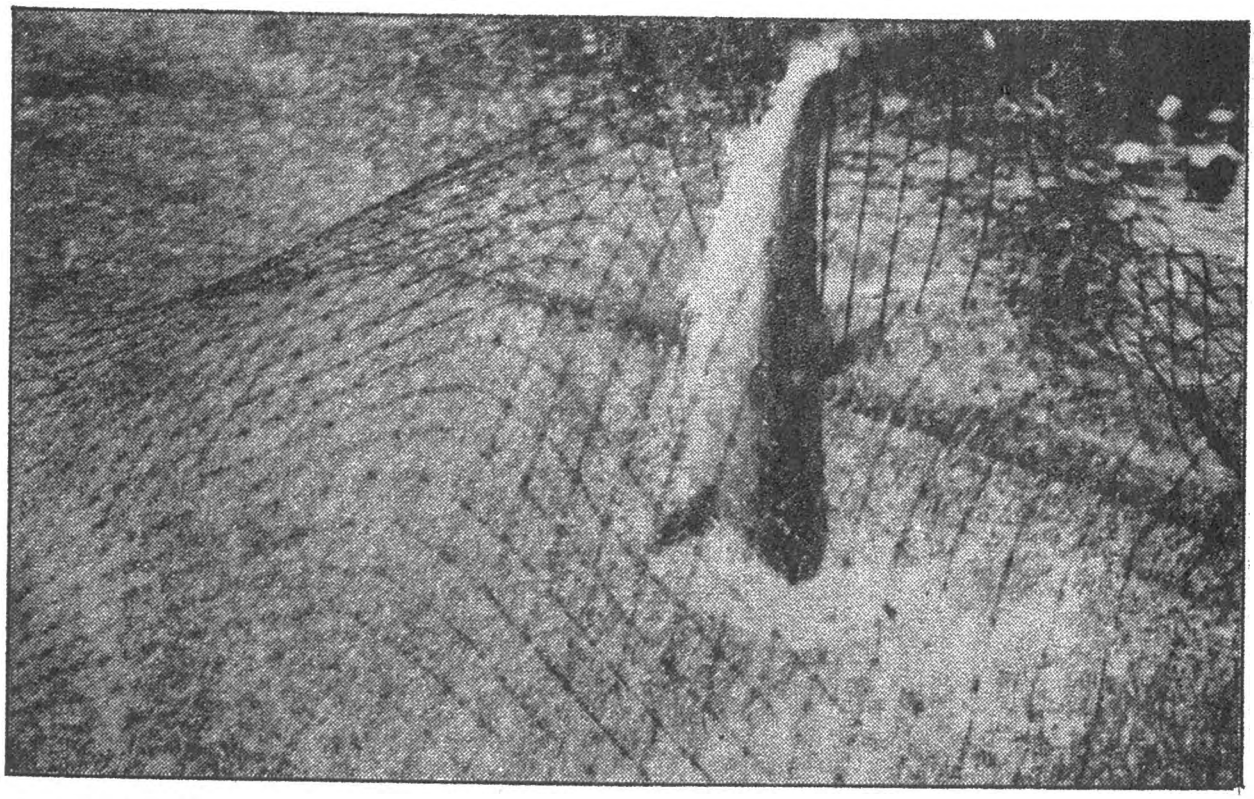


Plate 1



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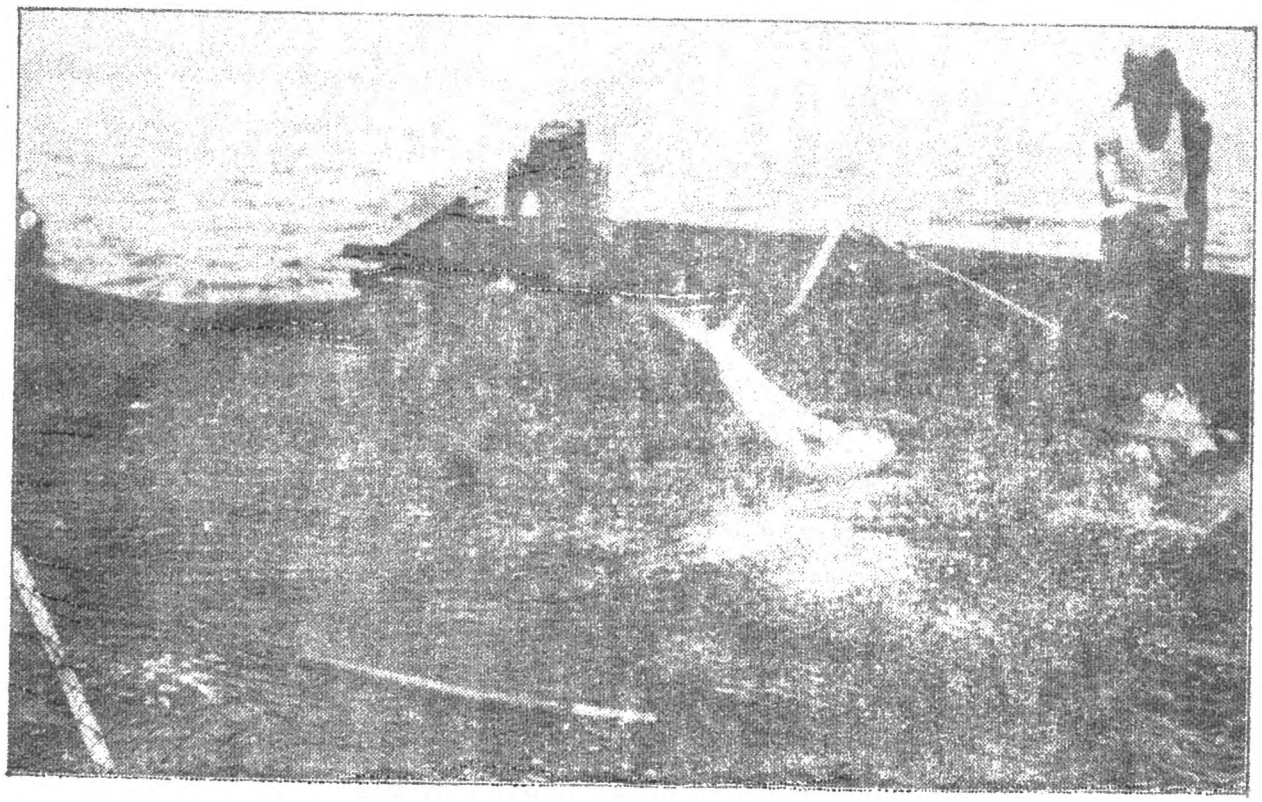

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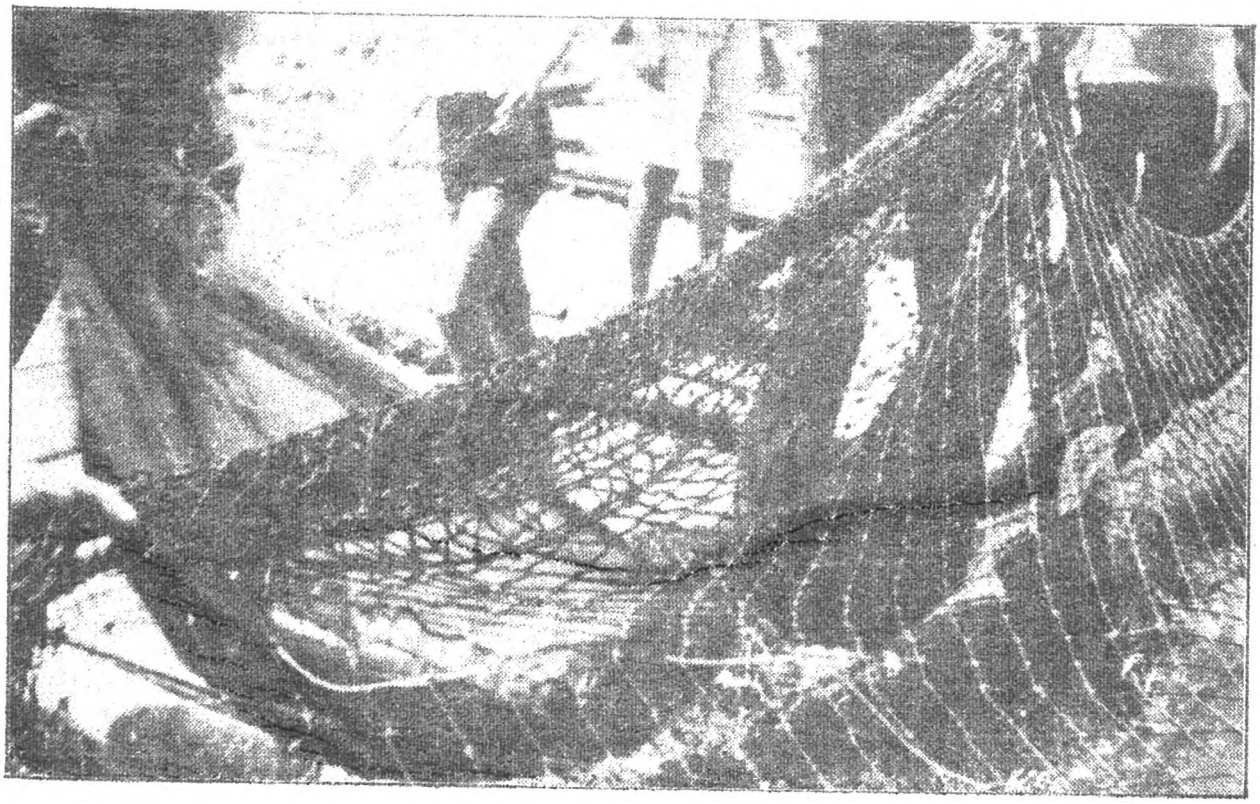

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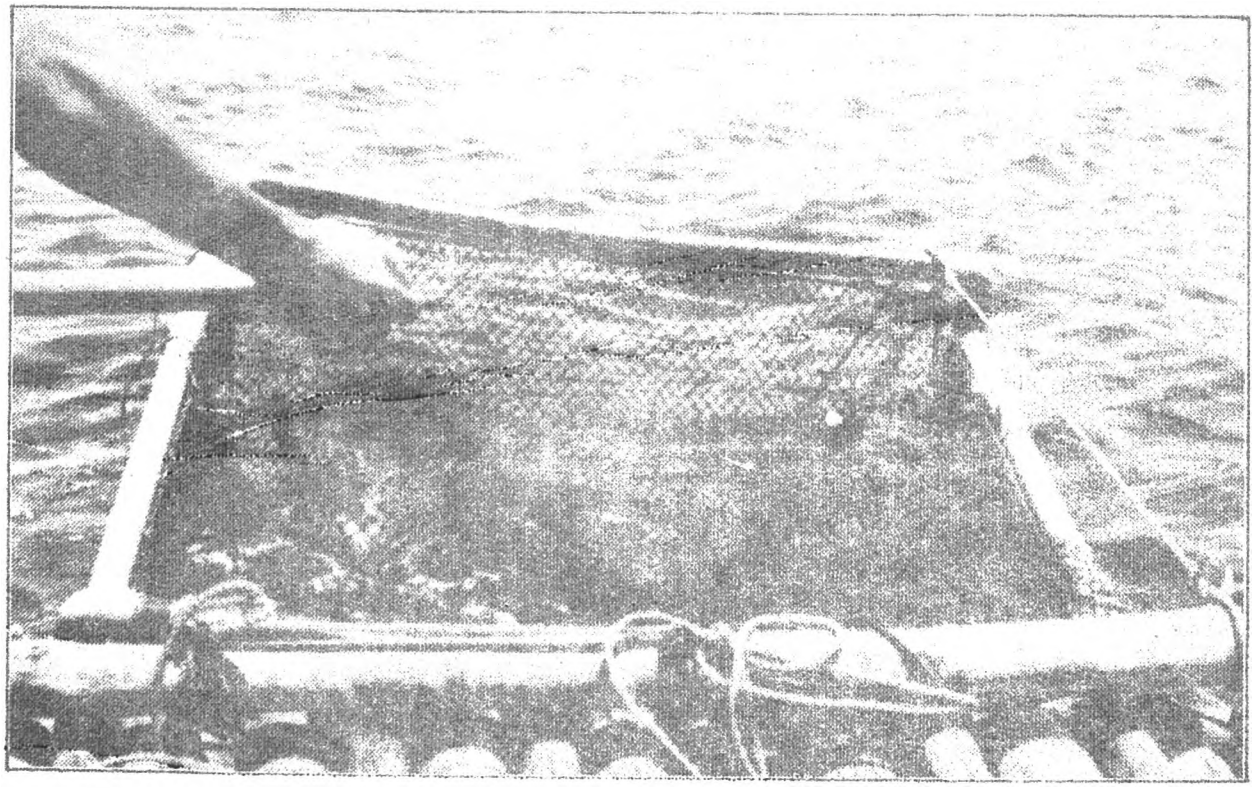

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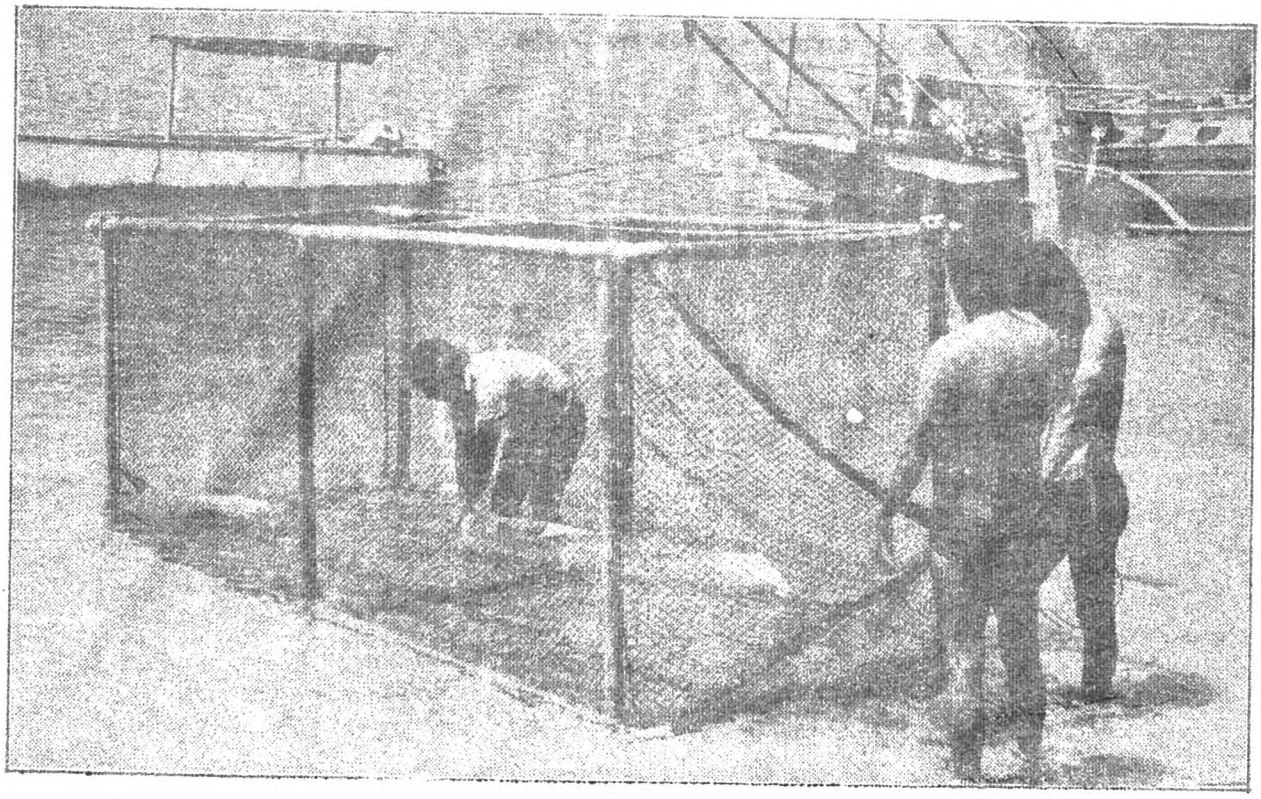
Plate 6



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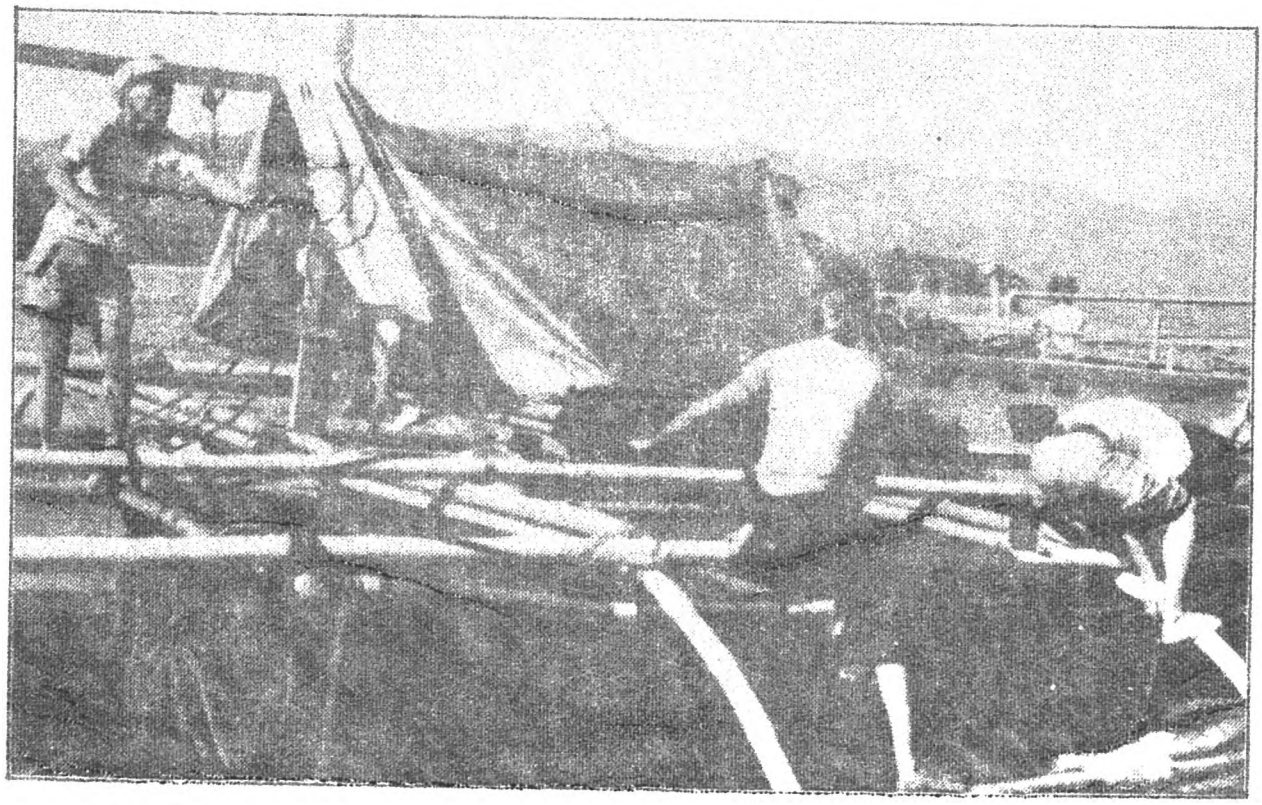

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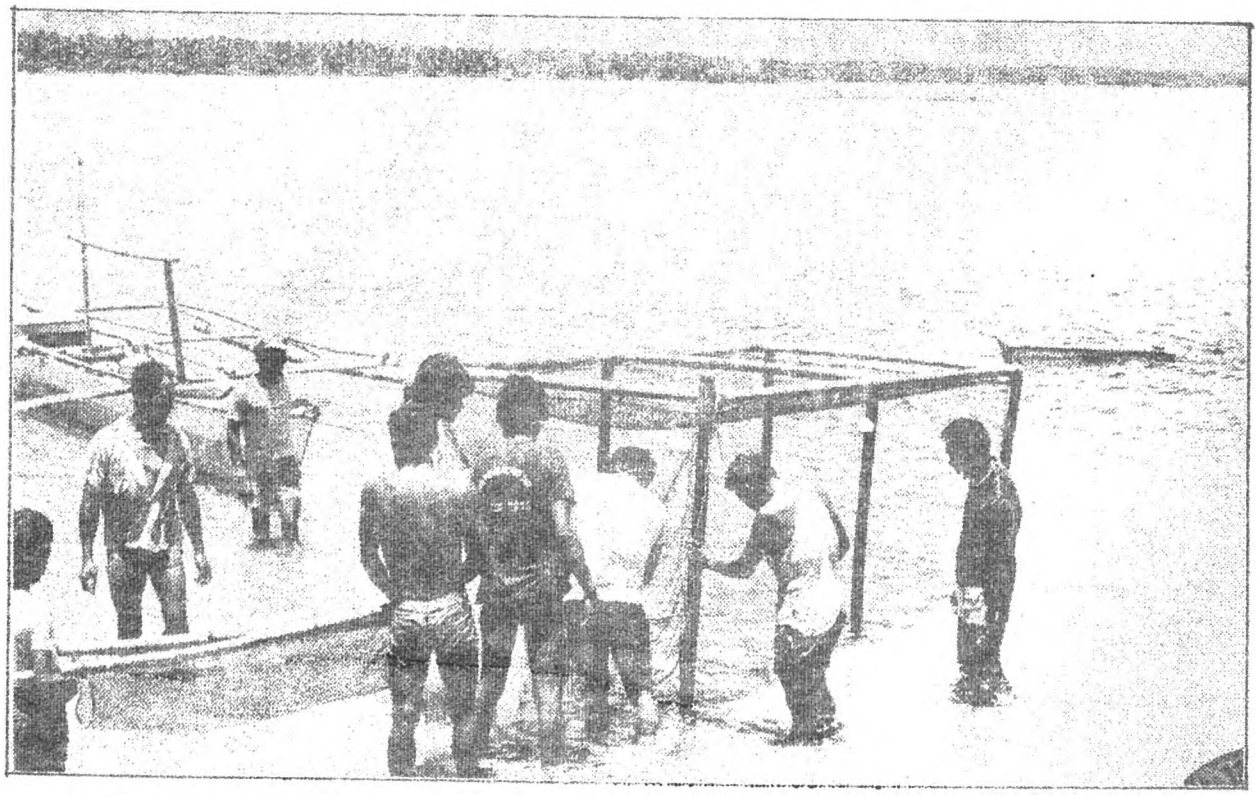

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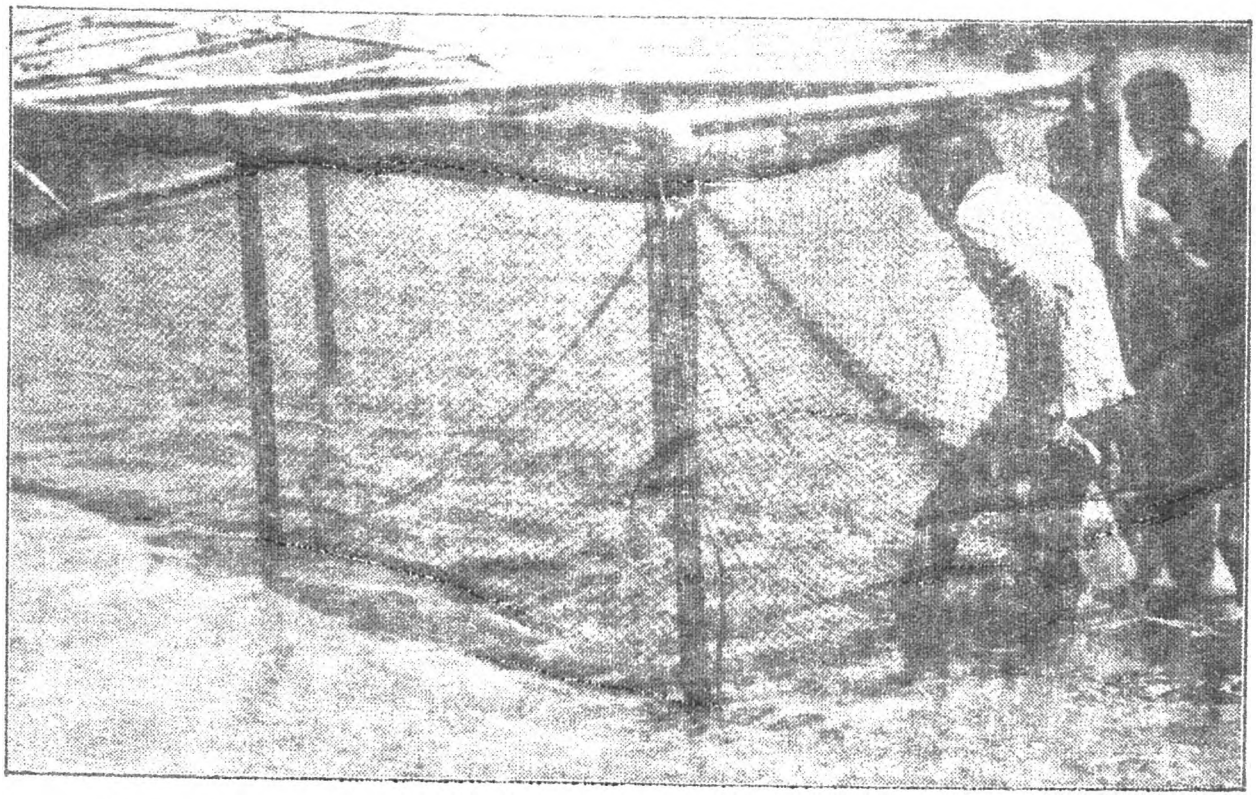

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Plate 12

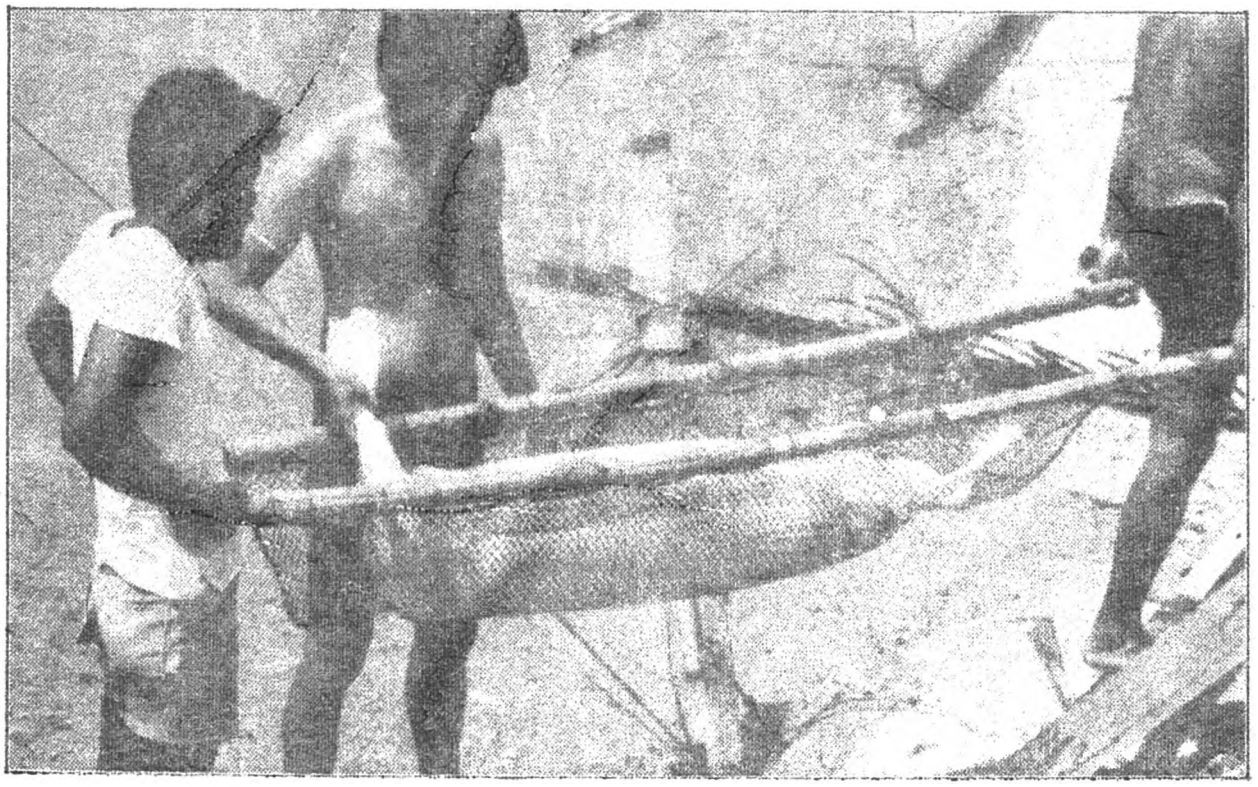
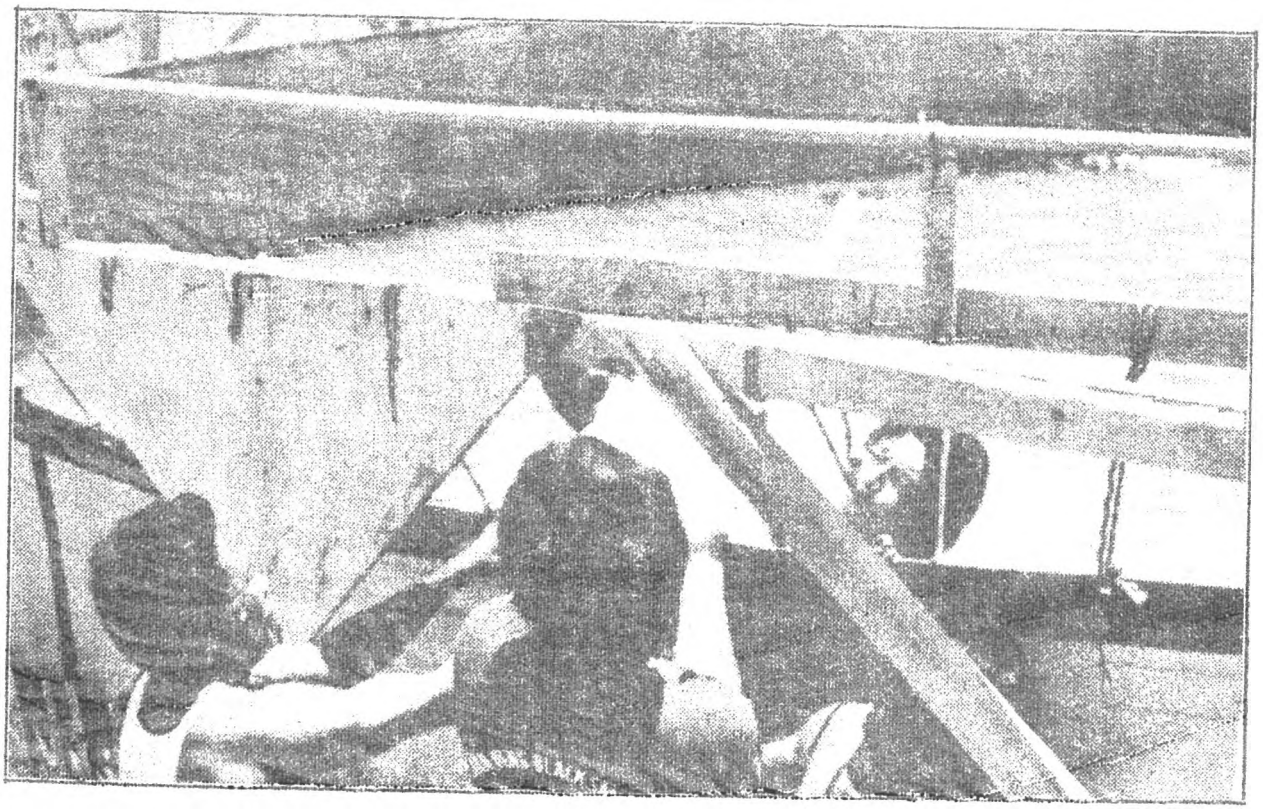


Plate 13

Plate 14

Plate 15



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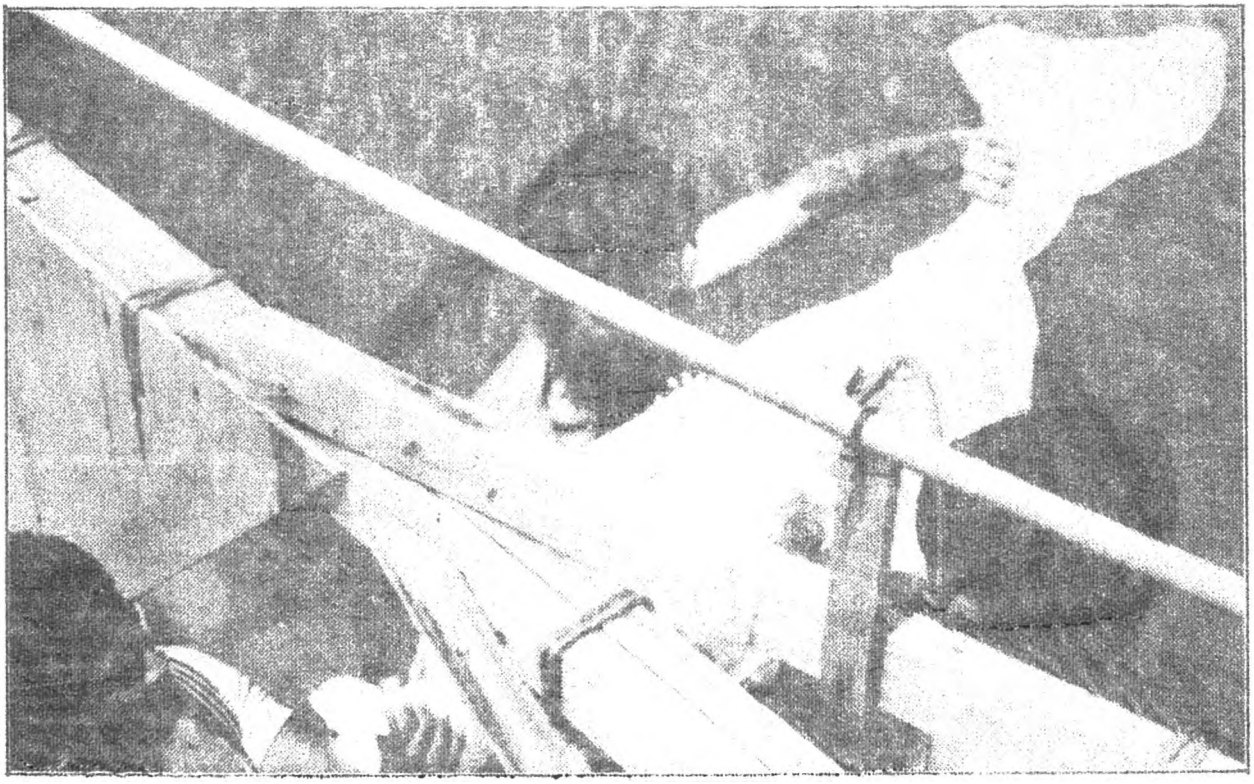

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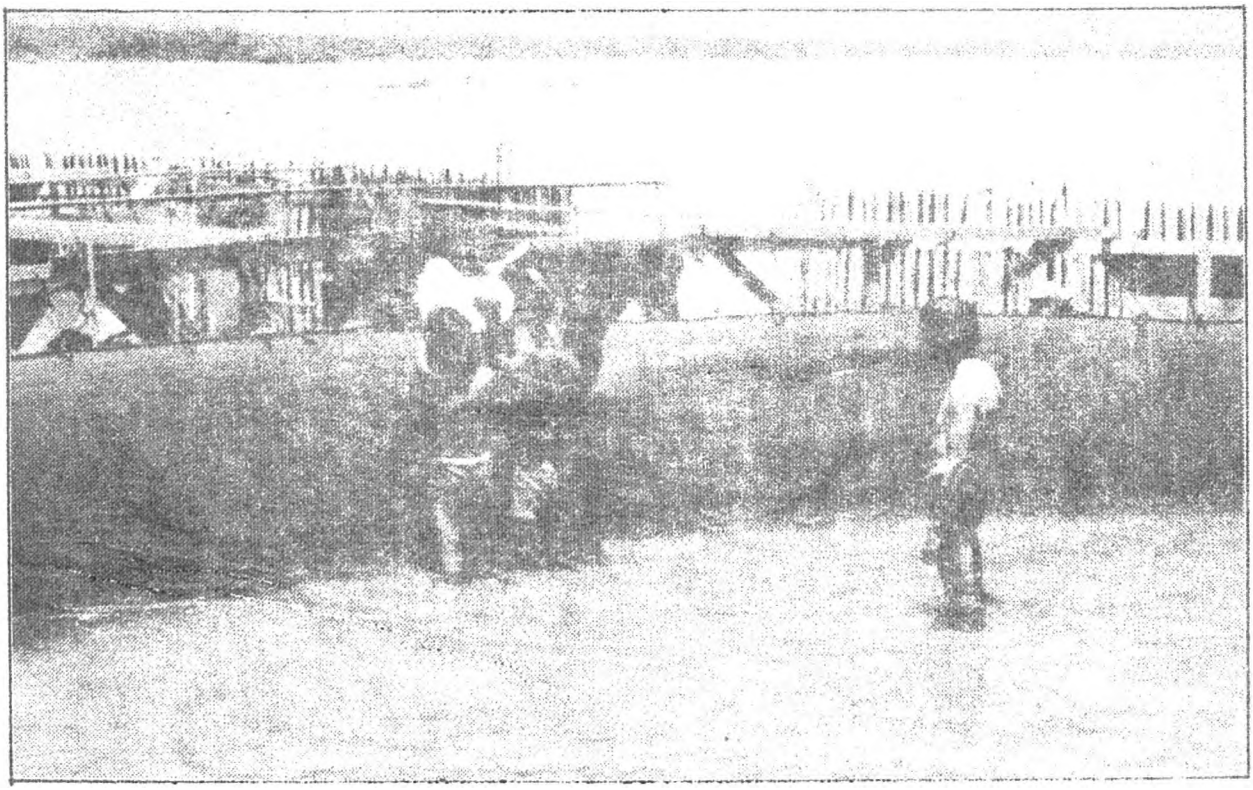

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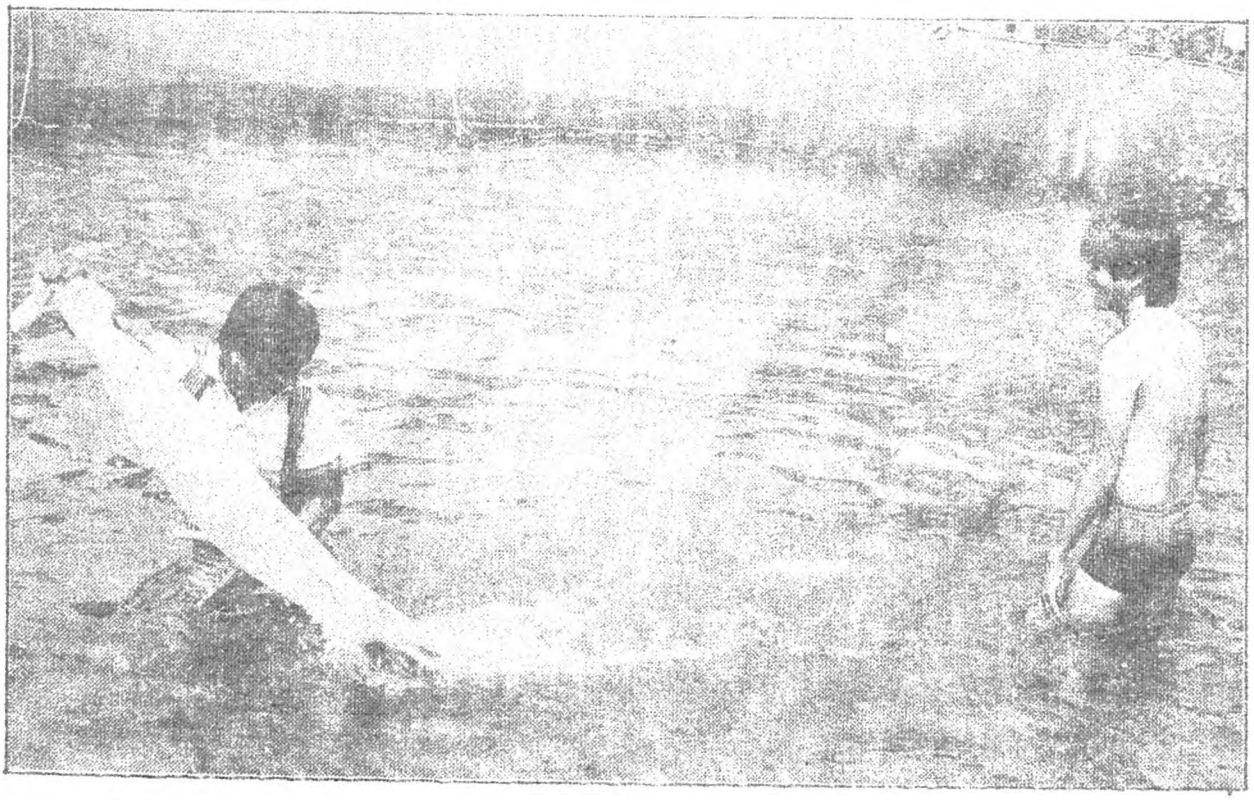

Plate 19

Plate 20