

THE NEW HASANG MODERNO, A FISH CORRAL USED IN THE PHILIPPINE WATERS¹

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TWELVE TEXT FIGURES

ABSTRACT

Of the many types of fish corrals used for catching fish in sheltered waters of the Philippines, the new *hasang moderno* which was developed and operated at Kalibo, Capiz, during the summer months of 1950, is considered to be the most effective. Like the other fish corrals, this gear consists of a series of enclosures with a leader, four wings, and three entrances or gates. It differs, however, from the other types in that the terminal pond is located at the same axis with the leader on the outer side of the semicircular enclosure which it superimposes. The multiple entrances, together with the leader and the series of enclosures, effectively prevent the escape of the fish which are intercepted.

The method of construction and operation of the new *hasang moderno* is described in this paper and is fully illustrated. Complete specifications of this gear are also discussed.

Fish corrals are guiding barriers which are set in different depths of sheltered waters to intercept fishes during their migration, impounding them into the collecting chamber where they are caught. They are constructed in various styles, ranging from a simple ambulatory pound, with or without a leader, to a more or less complicated structure consisting of a series of enclosures, gates, wings, and a leader which are so arranged as to effect an easy entrance but difficult exit for the intercepted fish.

Of all the fish corrals operated in the Philippines, the *hasang moderno* has been considered the most effective. Based on the description of Talavera and Montalban (1932), this fish corral (fig. 1) consists of three gates, *m*, *se*, and *s'e'*; four wings, *w*; a leader, *l*; a series of four enclosures; a heart-shaped terminal pound, *tp*, constructed at the end of one of the arms of the semicircular enclosure, *si*, which is superimposed by a triangular compartment, *tc*, and a triangular forechamber, *fc*, called *hasang*, from which the name of the fish corral was

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derived. This fish corral has undergone improvement, with simpler design and construction giving rise to the new hasang moderno. This new hasang moderno was first operated in Kalibo, Capiz, from April 1, 1950 to October 15, 1950. The

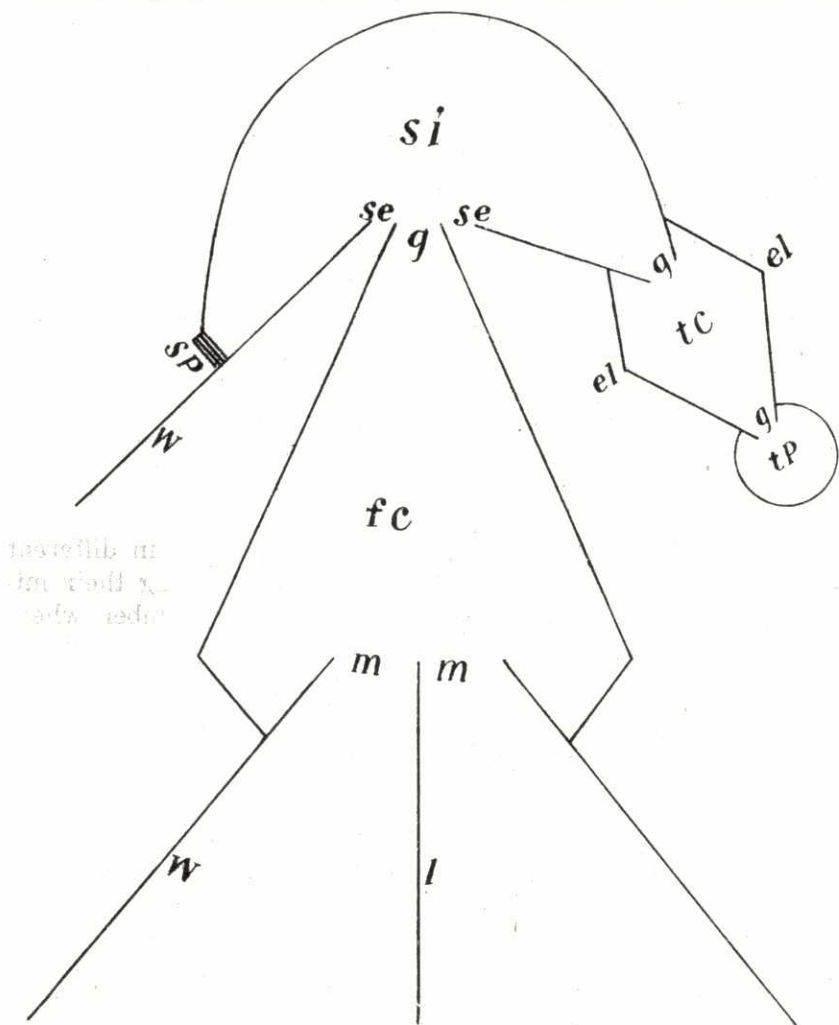


FIG. 1. Hasang moderno (1932) diagrammatic: *g*, entrance; *l*, leader; *m*, gate; *w*, wing; *el*, elbow; *fc*, forechamber; *se*, side gate; *si*, semi-circular compartment; *tp*, terminal pound.

operation was very successful to the extent that it attracted the attention of other fish corral operators. living not only

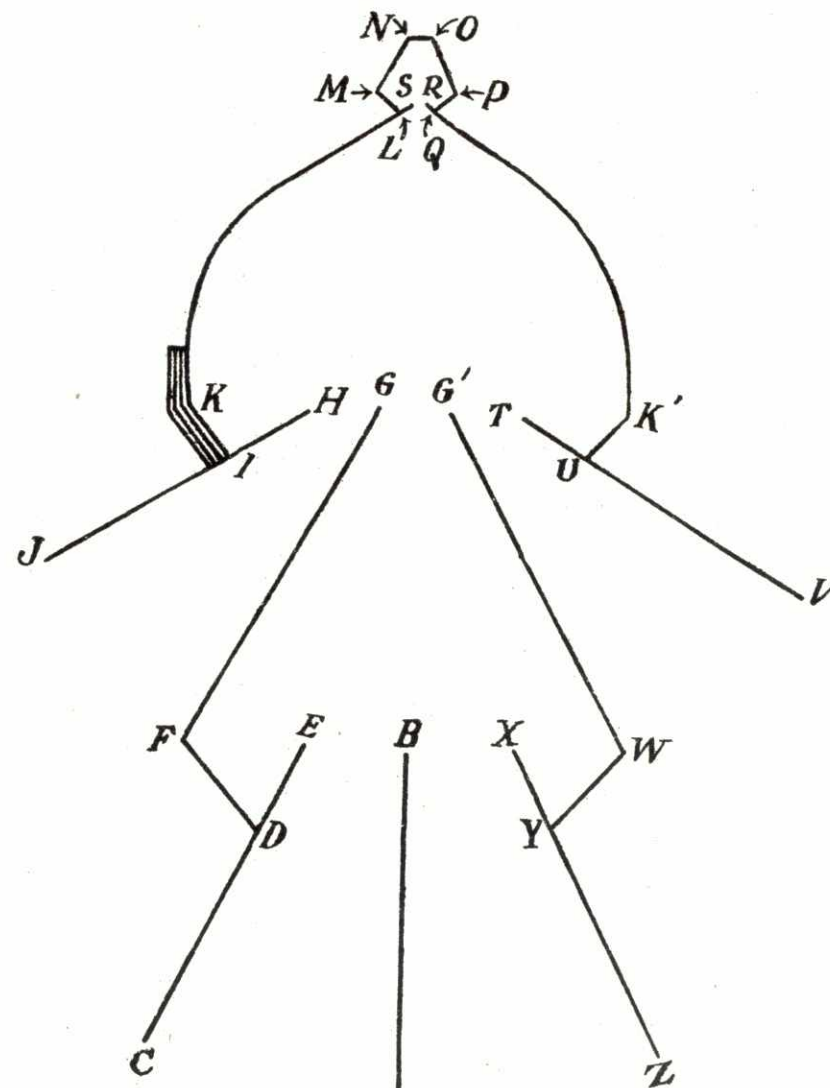


FIG. 2. Rasalan: The New Hasang Moderno diagrammatic: *g*, entrance; *l*, leader; *m*, gate; *w*, wing; *el*, elbow; *fc*, forechamber; *se*, side gate; *si*, semi-circular compartment; *tp*, terminal pound.

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This paper presents a detailed description of the construction and operation of this new type of gear.

GENERAL DESCRIPTION OF THE GEAR

Fig. 2 is the plan of the new hasang moderno. Like its prototype, it consists of a leader, *AB*; two lower wings, *CE* and *XZ*; two upper wings, *JH* and *TV*; three gates, *EX*, *GH*, *G'T*; a forechamber, *DFGG'WY*; a semicircular enclosure, *IKSRK'UT*; and a terminal pound, *LMNOPQ*. The terminal pound, however, is located at the same axis with the leader at the outer side of the semicircular enclosure which it directly superimposes.

Based on the new hasang moderno owned by Mr. Cirilo Lacerna Jr., a graduate of the Philippine Institute of Fisheries Technology, operated at Kalibo, Capiz, which may be taken as a typical sample of this fish corral, the measurements of the different parts are as follows:

The leader is 240 meters long and the lower and upper wings are 44 meters and 42.5 meters long, respectively; the forechamber is 44.60 meters at its greatest width, *FW*, and 31.55 meters long, measured from the lower gate to the entrance to the semicircular enclosure; the latter is also 44.5 meters wide, *KK'*, and 26.9 meters long, measured from midpoints of *GG'* and *SR*; while the terminal pound is 8.9 meters wide, *MP*, and 8.2 meters long measured from the mouth of the semicircular enclosure *SE* to side *NO*.

The gear is invariably set in sheltered waters along sandy or muddy beds which are free from corral reefs. These waters are supposed to be across known paths of fishes ranging in depth from 5 to 12 fathoms. Usually waters which beds are higher than their immediate surroundings are preferred.

The fences of the fish corral consist of frames and bamboo screens. The frames (fig. 3) consist of well-seasoned bamboo posts and braces. The bases of the posts are pointed and triangular holes are bored just below the nodes for the water to fill in the internodes, thus making it easy to plant them at the muddy bottom.

The bamboo screens consist of bamboo splits laced together

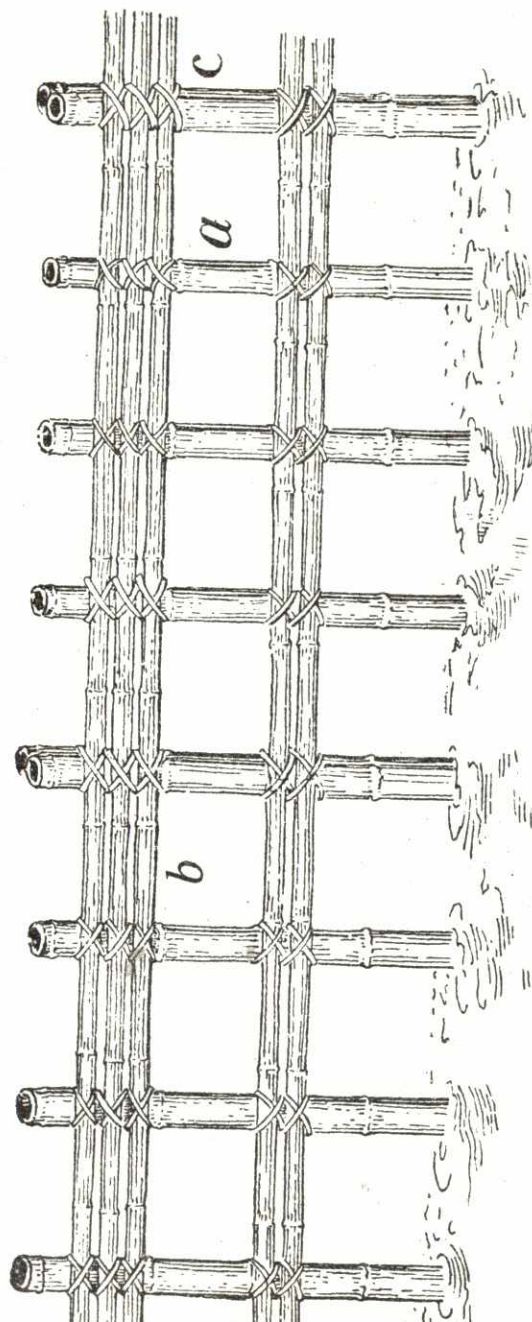


FIG. 3. The uprights or frames; *a*, uprights; *b*, braces; *c*, a bundle of two bamboos.

spp.). Figs. 4 and 5 show the appearance of the bamboo screens and Table 1 gives their specifications in the different parts of the fish corrals. As the depth of the bamboo screens are shallower than the depth of the water, two or more are joined end to end to fence the entire column of water. The screens for the leader, wings and forechamber have slats

TABLE 1.—Specifications of the new *hasang moderno* operated at Kalibo, Capiz.

Parts					Bamboo screens			Remarks
Name	Symbols	Length in meters	Number of posts	Number of screens	Size of screens in meters (depth x length)	Size of splits in meters (width x length)	Distance between splits in meters	
L	AB1	30	6	12	4.2×5	0.02×4.2	0.12	Excepting A: two rows of bamboo screens are set on the framework overlapping each other by 10 cm.
E	AB2	35	7	14	4.0×5	0.02×4.0	0.12	
A	AB3	35	7	14	3.8×5	0.02×3.8	0.12	
D	AB4	35	7	14	3.5×5	0.02×3.5	0.12	
E	AB5	35	7	14	3.2×5	0.02×3.2	0.12	
E	AB6	35	7	14	3.2×5	0.02×3.0	0.12	
P	AB7	35	7	14	3.0×5	0.02×3.0	0.12	
Total		240	28					
W	DC	29	6	12	4.2×5	0.013×4.2	0.83	Two rows of bamboo screens are set on the framework overlapping each other by 10 cm.
	DE	15	3	6	4.5×5	0.013×4.5	0.83	
I	YZ	29	6	12	4.2×5	0.013×4.2	0.83	
N	XY	15	3	6	4.5×5	0.013×4.5	0.83	
	JI	28.5	6	11.8	4.7×5	0.013×4.7	0.12	
G	NU	14	3	6	5.4×5	0.012×5.4	0.42	
S	UV	28.5	6	11.8	4.7×5	0.013×4.7	0.12	
	TU	14	3	6	5.4×5	0.012×5.4	0.042	
Total		171	40	71.6				
Fore-chamber	DF	12.5	4	4	4.5×6.25	0.013×4.5	0.83	Two rows of bamboo screens are set on the framework overlapping each other by 10 cm.
	FG	30.25	10	10	4.9×6.15	0.013×4.9	0.83	
	YW	12.5	4	4	4.5×6.25	0.013×4.5	0.83	
	WG	30.25	10	10	4.9×6.15	0.013×4.9	0.83	
Total		85.50	28	28				
Semi-circular enclosure	IK	10	3	4	6×5	0.012×6	0.42	Two rows of bamboo screens are set on the framework overlapping each other by 10 cm.
	KL	36.47	12	14	6×5.3	0.012×6	0.42	
	LS	4	2	2	6×4	0.012×6	0.01	
	RQ	4	2	2	6×4	0.012×6	0.01	
	QU	46.47	15	18	6×5.3	0.021×6	0.42	
Total		98	34	440				

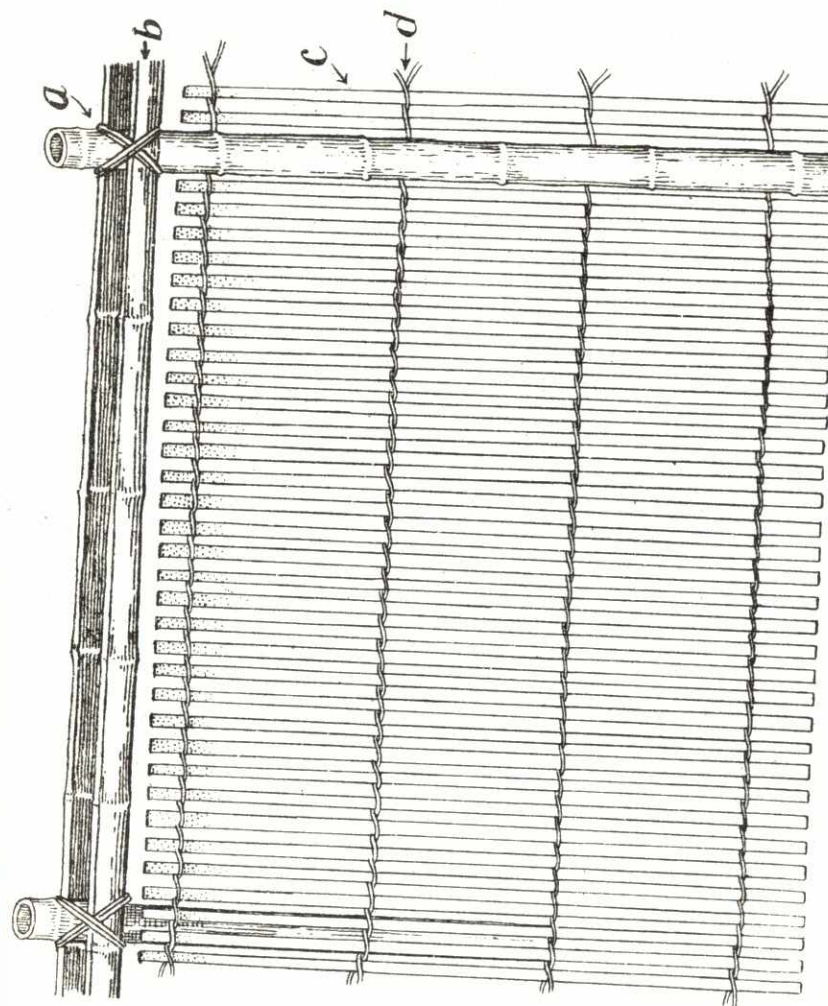


FIG. 4. A diagrammatic presentation of a portion of the terminal pound and semi-circular enclosure showing the lacing of the slats; a, uprights; b, brace; c, bamboo screen; d, lacing.

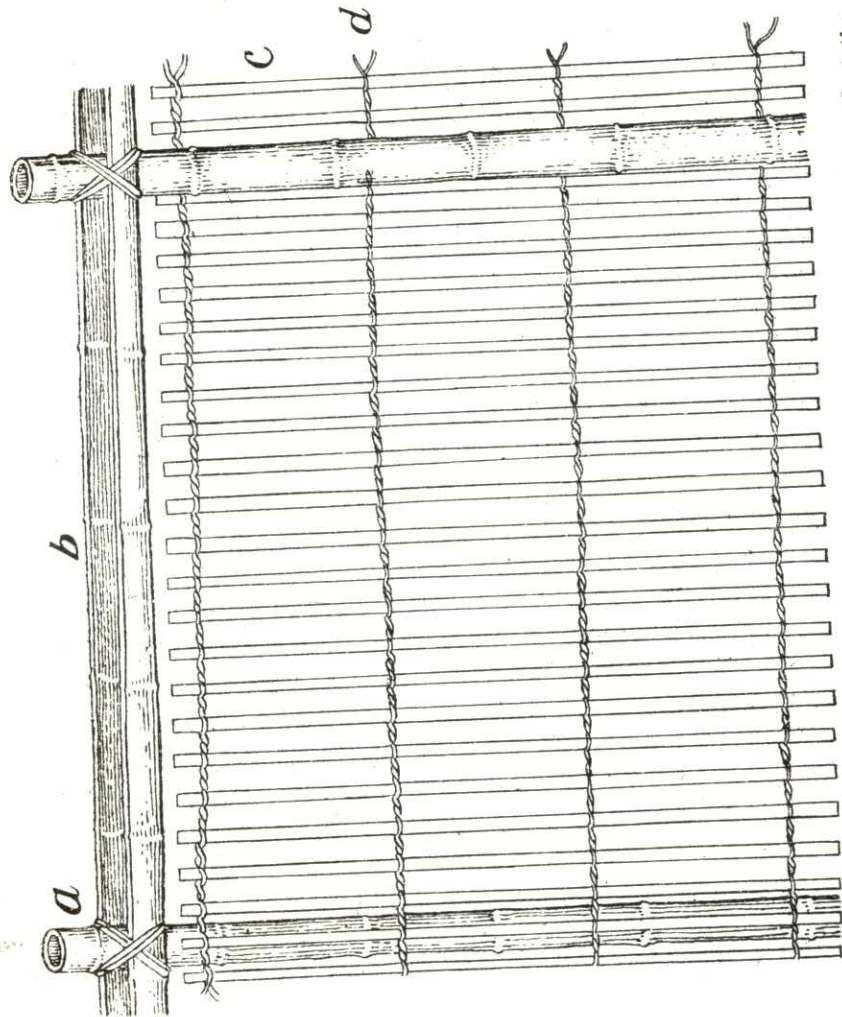


FIG. 5. A diagrammatic presentation of a portion of the bamboo matting used at the wings, and forechamber and leader showing how the slats are laced: *a*, bamboo post; *b*, brace; *c*, bamboo screen; *d*, lacing.

Terminal pound	LM	2.8	2	3	6 × 2.5	0.012 × 6	0.01	Two rows of bamboo screens are set on the framework overlapping each other by 10 cm.
	MN	3.5	4	6	6 × 4.3	0.012 × 6	0.01	
	NO	3.5	2	3	6 × 3.7	0.012 × 6	0.01	
	OP	3.5	4	6	6 × 4.3	0.012 × 6	0.01	
	PQ	2.8	2	3	6 × 2.5	0.012 × 6	0.01	
Total		26.1	14	21				

Gates and entrances	-EB	6.5	A bamboo bridge is constructed above each gate and entrance.
	-BX	6.5	
	-NG	3.2	
	-GT	3.2	
	-GG	4.25	
	-RS	0.5	

coarser than those for the semicircular enclosure and terminal pound.

The screens are grouped according to the parts of the fish corral where they are intended to be set. Those that go together are joined lengthwise, and then rolled like mats to facilitate the handling and placing along the framework of the fish corral.

The setting of the fish corral is done after the fishing ground has been carefully mapped out, and all materials for the frame and screens have been prepared.

CONSTRUCTION AND SETTING OF THE FISH KORRAL

The outline-plan of the fish corral (fig. 2) is carefully laid or plotted by using imaginary lines and temporary stakes. The leader is laid perpendicularly to the direction of the current or the shoreline. Its length depends upon the distance of the corral to the shore. Generally, the end of the leader reaches very near the shoreline. It is believed that the longer the leader, the more fishes are intercepted and guided into the collecting pound of the gear. This setting requires the services of the fish-coral-master fisherman, who directs several good divers and other hands. The planting of the posts is done during low tide. Guide posts are first planted: anterior and posterior ends of the leader and wings, then the ends and corners of the different chambers. The planting of the other posts follows by setting them at two meters apart at the semicircular enclosure and terminal pound; three meters interval at the forechamber; and 5 meters between them at the wings

and leader. Care is taken so as to make them stand perpendicularly to the water. To strengthen the hold of the corral at the bottom and to prevent the posts from reclining due to wind and wave action, a bundle of two to four bamboos (fig. 3c) is used for every fourth post. Two to four lines of bamboos are braced to connect each pole just above the bamboo screens. The whole set of the bamboo poles constitute the framework of the fish corral.

The setting of the bamboo screens follows the completion of the frame. As in the setting of the posts, a stone weight of about 15 kilos is tied at the lower end of every rolled screen to keep it standing erect close to the frames when sank. The screen is unrolled little by little and tied with the rattan splits, hagnaya, or threaded coconut inflorescence bud scales to the framework. This procedure is repeated until all the screens are set to the different parts of the fish corral.

The setting of the screens is usually begun with the terminal pound followed by the semicircular enclosure, then the upper wings, forechamber, lower wings, and lastly, the leader. This order is followed because, often times, fishes begin to enter the enclosures as soon as they are set.

Unless destroyed by gales or typhoons, the hasang moderno may last from six to ten months. Its upkeep, however, requires periodical changing of the screens whenever they become weak or when they need cleaning and drying. Hence, there must be a reserve of at least one-half of the total number of screens needed in the fish corral during the season. When the season is over, all the screens are removed, leaving the framework in the water to be used again during the next season. The screens are scrubbed, dried and the weak slats changed and stored for the next season.

THE NETS

There are two nets used to catch the fish that enter the fish corral. One of them is the scoop seine (*sigin*) used to collect fishes at the semicircular enclosure. The other, the shrimp net, is used at the terminal pound.

Fig. 6 is a diagrammatic structure of the scoop seine and Tables 2 and 3 give its specifications. It consists of a bunt (fig. 6A, B) flanked by two wings (fig. 6C, D) hung on a

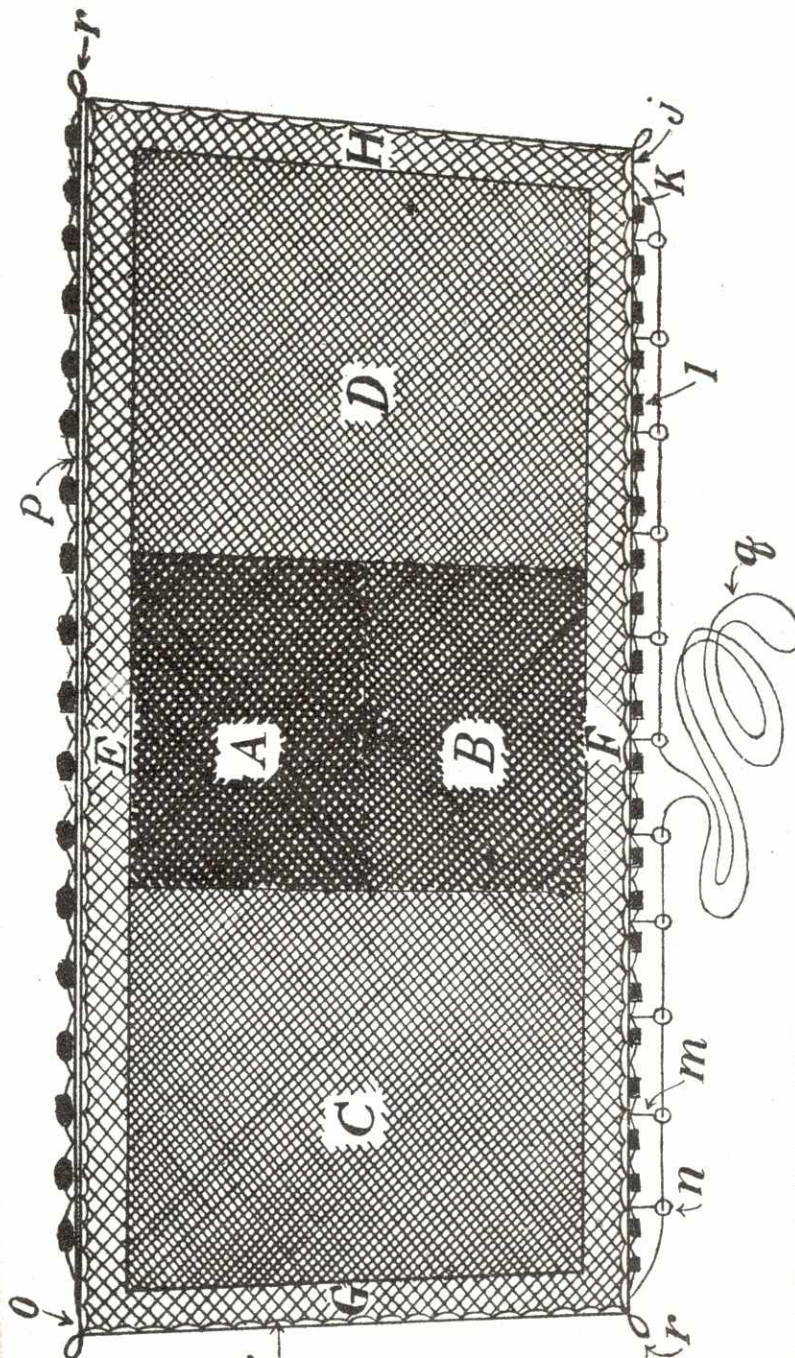


FIG. 6. Structural plan of the *sigin*: A and B bunt; C and D, wings; E, F, G and H, selvages; i, breast line; j, secondary lead line; k, lead weight; l, ring; m, bridle; n, ring; o, secondary floatline; p, primary floatline; q, pursing rope; r, eye splice.

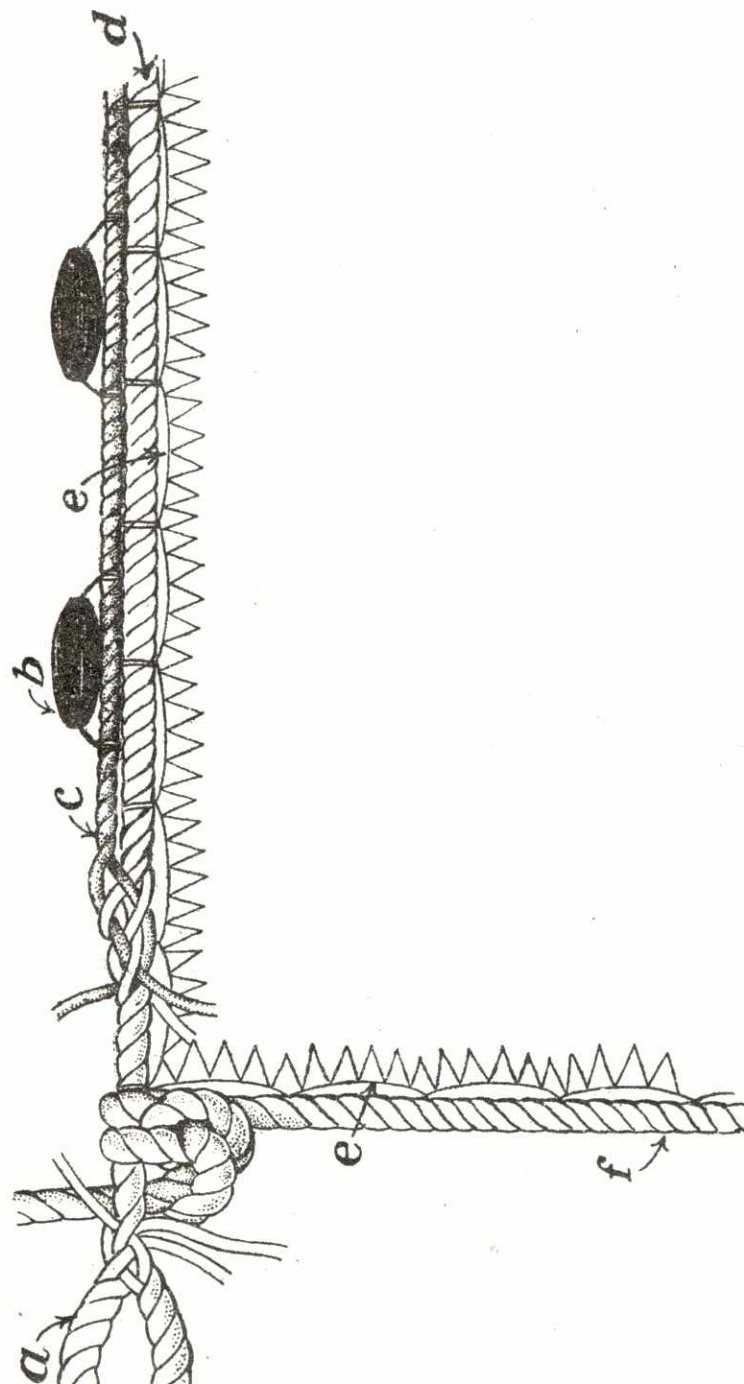
TABLE 2.—Specification of the seine (sign)

Parts	Symbols	Materials		Size of meshes stretched	Horizontal	Meshes deep	Strip	Remarks
		Kind	Twine number					
Bunt	A	cotton twine	12	2.24	312	500	1	Nettings joined mesh to mesh
	B	cotton twine	9	2.54	300	300	1	
Wings	C	cotton	9	2.54	573	800	1	Nettings joined mesh to mesh
	D	cotton	9	2.54	573	800	1	
S	E	cotton	36	5.72	7	458	1	Outer edges of bunt and wings are joined to the selvages 4 meshes of the former to every mesh of the latter and then laced by a 26-thread cotton twine to the hanging line.
E	F	cotton	36	5.72	7	407	1	
L	G	cotton	36	5.72	7	220	1	
V	H	cotton	36	5.72	7	220	1	
A								
G								
E								

TABLE 3.—Ropes and other accessories of the seine.

Parts	Materials	Size in cm.	Length in m.	Number of pieces	Remarks
Primary float line	Manila rope	0.91 dia.	27.13	1	Where 70 floats are tied at 30.48 cm. distances.
Secondary float line	Manila rope	1.58 dia.	27.13	1	Where the lacing line of selvage are hung.
Breastline	Manila rope	1.58 dia.	12.19	1	Where the lacing line on width is hung.
Primary leadline	Manila rope	0.91 dia.	22.56	1	Where the lacing line of the cotton selvage is hung.
Secondary leadline	Manila rope	1.58 dia.	22.56	1	Where the lead weights are tied at 35.56 cm. distances.
Pursing rope	Manila rope	1.27 dia.	50	1	Each end is tied to the end of the primary leadline.
Bridle line	Manila rope	0.91 dia.	0.46	62	Distributed along primary leadline 45.72 cm. apart.
Floats	Soft wood	4 dia.	7.62	70	Equally distributed along the primary cork-line, 30.48 cm. far apart.
Sinkers	Lead	4 ounces		62	Equally distributed along the primary leadline 35.56 cm. far apart.
Rings	GI	.6 X 7 dia.		18	

ting of 2.54 centimeters mesh-stretched, 573 meshes wide and 800 meshes deep. The bunt is composed of two nettings, the upper portion of which is 312 meshes wide and 500 meshes deep, 2.24 centimeters mesh-stretched and made of 12-thread cotton twine; while the lower portion is a 9-thread cotton twine netting, 2.54 centimeters mesh-stretched, 312 meshes wide and 300 meshes deep. These are joined together mesh to mesh.



A portion of the headline; a, eye, splice; b, float; c, primary floatline; d, secondary floatline; e, lacing line; f, breastline.

The selvages (fig. 6E, F, G, H) of coarser nettings are made of 36-thread seine twine, being 5.72 mesh-stretched and joined with the wings and bunt with a ratio of one to every four meshes. The selvages are seized by a 9-thread twine and hung to the secondary corkline, breastline and secondary leadline. Each end of the hanging line is an eye-splice (fig. 6r) of 7.62 centimeters diameter. A pull rope is tied to each of these eye-splices during the fishing operation. The ends of the purse line (fig. 6g) are spliced on the ends of the secondary leadline.

Fig. 7 shows a portion of the corkline. Each float is 7.62 centimeters long and 4 centimeters at its greatest diameter. The floats are tied along the primary floatline (fig. 7c) at 30.48 centimeters intervals. Sixty-two lead weights (fig. 6l), each weighing four ounces are strung to the leadline at intervals of 35.56 centimeters. In operation, two additional stone weights of 40 pounds each are tied to each end of the leadline to facilitate the sinking of the net.

The primary corkline and the primary leadline are spliced to the secondary corkline and secondary leadline, respectively.

Fig. 8 is the diagrammatic presentation of the shrimp net. It is in the form of an isosceles trapezoid and made of several pieces of sinamay cloth sewed together. This is hung to a Manila rope, 1.27 centimeters in diameter, with 40 per cent slack by a 9-thread cotton twine. The finished shrimp net is 7.74 meters and 3.43 meters on its parallel sides, while each of the nonparallel sides is 8.43 meters.

Like the scoop seine, each end of the hanging line is an eye splice (fig. 8b) where the pull rope is tied during the operation. On the midpoints of each of the nonparallel sides and ends of the longer parallel side are tied GI rings (fig. 8c) which are threaded into the gliding rope when the net is shot and hauled in at the terminal pound.

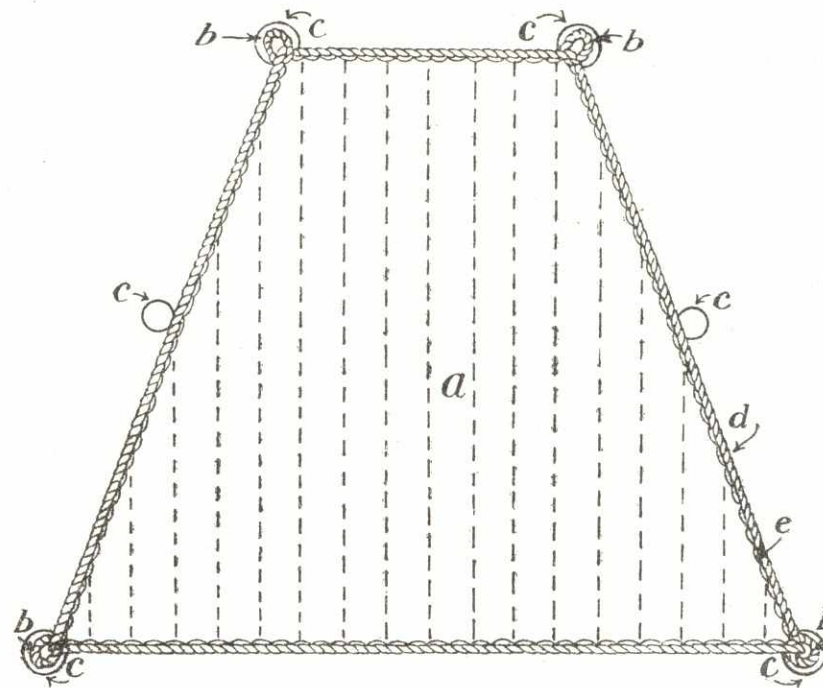
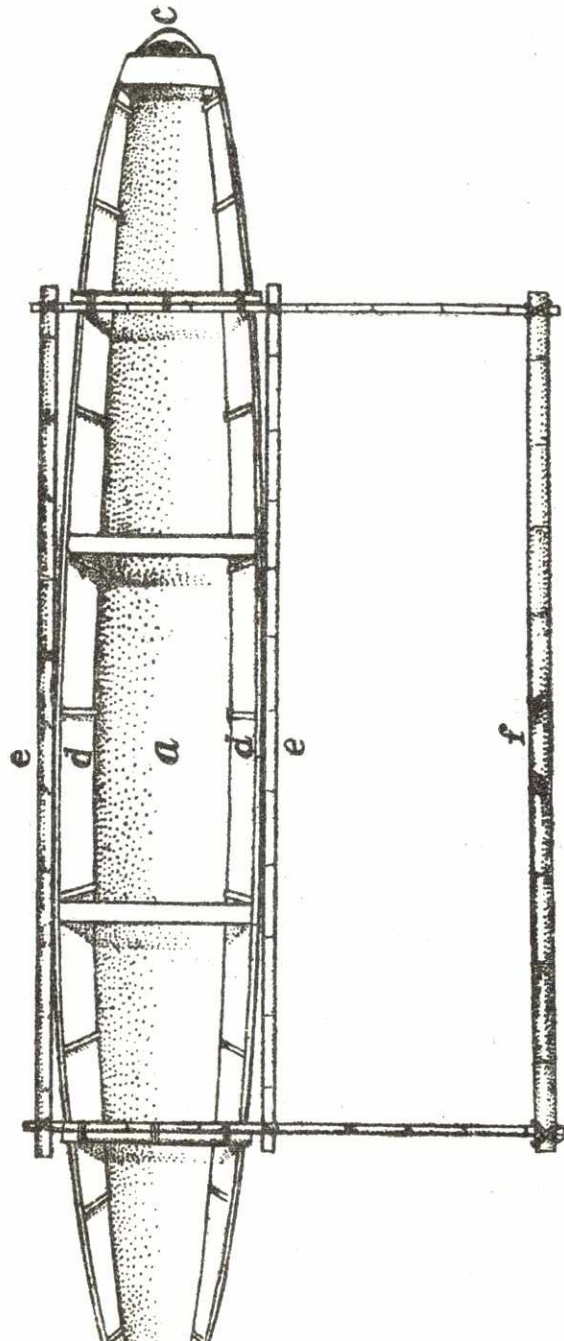


FIG. 8. A diagrammatic presentation of the structural plan of the shrimp net (not drawn to scale): a, sinamay cloth; b, sling; c, G. I. rings; d, hanging line; e, lacing line.

The following materials enter into the construction of the shrimp net: 87.47 meters \times 1 meter sinamay cloth, 30 meters Manila rope \times 1.27 centimeters diameter, 4 pieces GI rings 0.8 cm. \times 7.62 cm. diameter, and 50 meters cotton twine 9-thread medium laid.

THE BOATS

Two boats are used in the fishing operation. The bigger boat (fig. 9) is used to transport the fishermen and nets to and from the fish corral, while the smaller one is used to carry the catch from the fish corral to the shore. The bigger boat is an ordinary dugout, 14 meters long, 1 meter wide and 0.54 meter deep, with one wooden planking on each side. An outrigger is provided only on the port side of the dugout, so that it can be brought close to the fence of the fish corral.



g. 9. Top view of the main boat; *a*, hollow keel; *b*, bow; *d*, wooden planking; *e*, bamboo for oar-locks; *f*, outrigger.

The small boat (fig. 10) is flat-bottomed with pointed bow and no outriggers. It is about 3.84 meters long, 0.7 meter wide and 0.49 meter deep. A piece of bamboo is tied on top of each gunwales (fig. 10a) where the oars are tied when the boat is rowed. Like the bigger boat, the depth and deck space are increased by planking on each side.

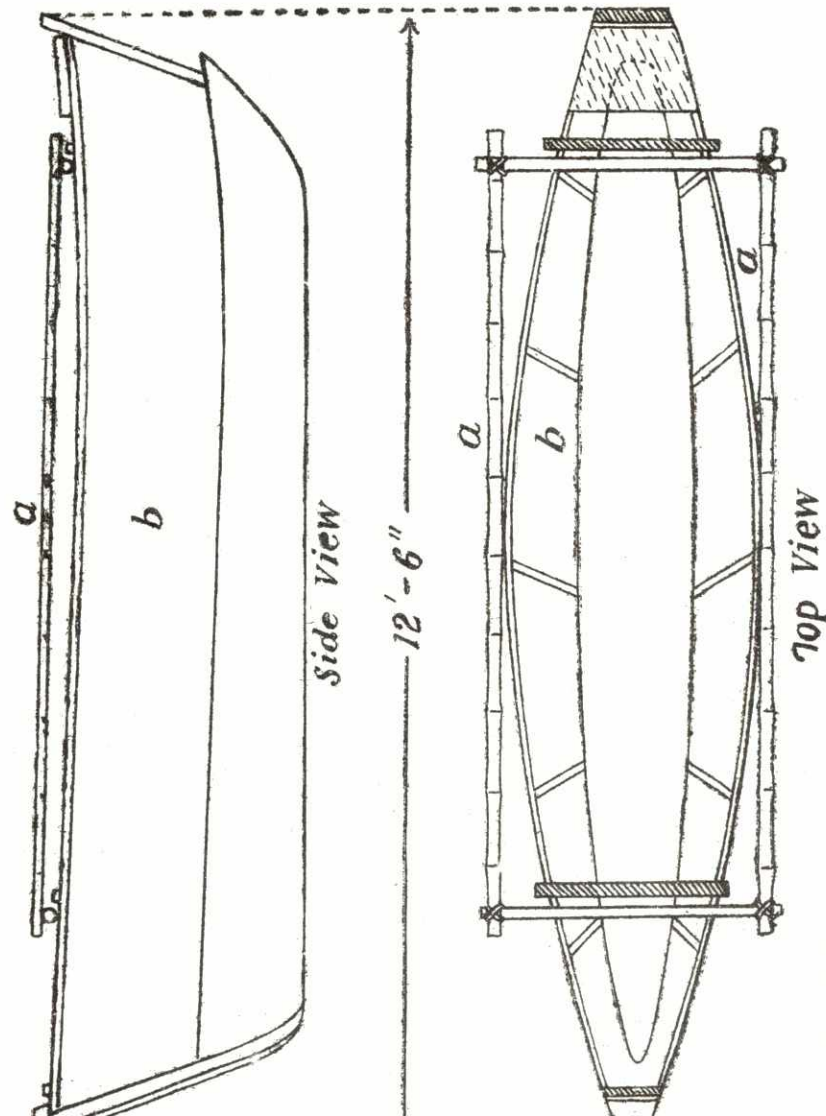


FIG. 10. The lateral and side views of the small boat; *a*, bamboo oarlocks; *b*, planking.

THE CREW: THEIR DUTIES AND PARTICIPATION
IN THE CATCH

A complement of 16 fishermen is needed to operate the fish corral: one master fisherman, two assistant master fishermen, four divers and nine ordinary fishermen. The master fisherman directs all the work, including the construction, maintenance and fishing operations of the fish corrals, and the marketing of the catch. The divers do the construction and repair of the gear, while the ordinary fishermen act as general utility men. All, however, help in the catching of the fish inside the semi-circular enclosure and the terminal pound.

The splitting of the bamboos, cleaning and lacing or weaving of the slats of the bamboo screens are done by contract labor. The expenses incurred are considered as a part of the costs of operation which are deducted from the gross sales before the profit is declared.

The members of the crew are paid on the profit-sharing basis. The cost of operation, which includes the expenses incurred for the construction of the bamboo screens, taxes, licenses, twines, rattan splits and other supplies needed in the repair of the fish corral and accessories, is deducted from the gross sales and the remainder is divided into two equal parts. One part goes to the owner of the fish corral while the other part is divided into 15 shares distributed as follows:

1 Master fisherman	2 shares
2 Assistant master fisherman	1½ shares each
4 Divers	1¼ shares each
9 Ordinary fishermen	1 share each

FISHING OPERATION

The catching of the fish that enter the terminal pound and the semicircular enclosure is done during the early dawn so that the catch may be brought to the market in time to be sold in the morning. Hauling may also be done at night during the dark phase of the moon, especially during ebb time, to catch shrimps and other fishes with the use of light.

Seven men consisting of one assistant master fisherman and six ordinary fishermen are needed to operate the shrimp net in the terminal pound. Four stone weights of two kilos each are tied to the four corners of the net. Then gliding ropes are tied at points *e* and *f* of sides *AC* and *BD* (fig. 11) respectively.

each ring (fig. 8c) is threaded by the corresponding gliding rope thus allowing the net to glide up and down when setting and hauling. They also serve as supports of the net when set, and keeping it from being drifted by the current.

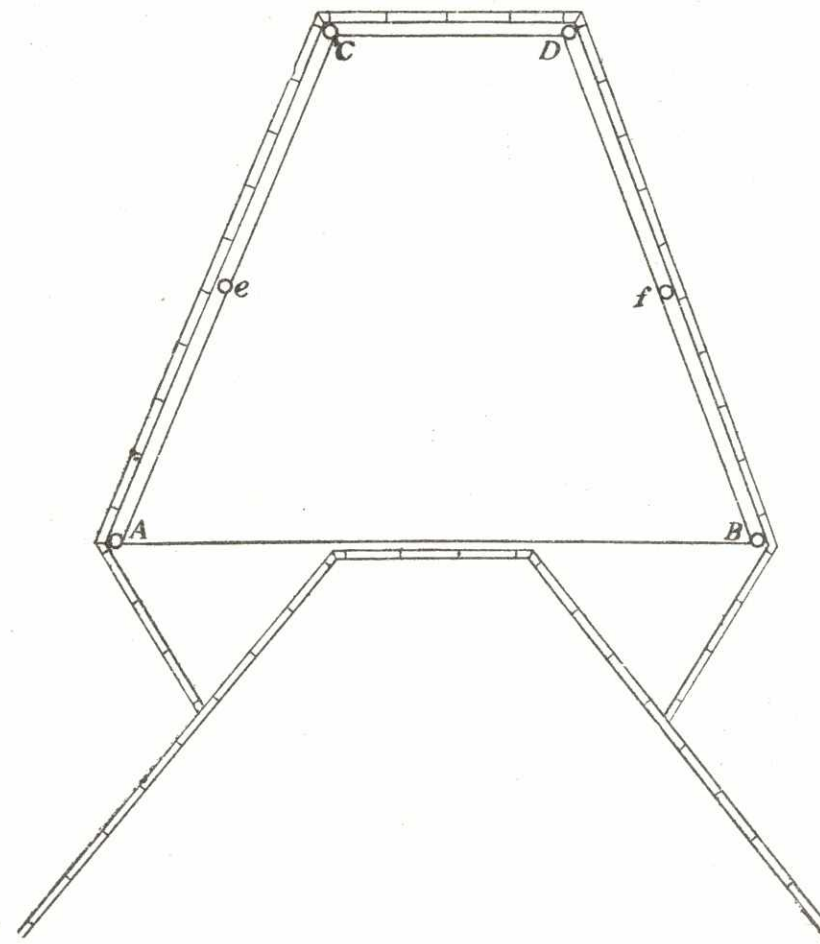


FIG. 11. The terminal pound showing how the shrimp net is laid out during fishing operation. *A B C D* the net.

In setting the net, the eye splices (fig. 8b) are each tied down with a pull rope while the rings are threaded by the respective gliding ropes. The corners are tied with a stone weight of two kilos each. Corners *C* and *D* (fig. 11) are

is done to prevent the covering of the fish inside the pound by the net. Then, the pull ropes at C and D are pulled to spread the net in such a way that the bottom of the terminal pound is covered entirely. After a while, it is raised to scoop the catch. This operation is performed several times.

Fig. 12 is a diagrammatic presentation of the setting and hauling of the net at the semicircular enclosure. Nine fishermen, including the master fisherman and one assistant master

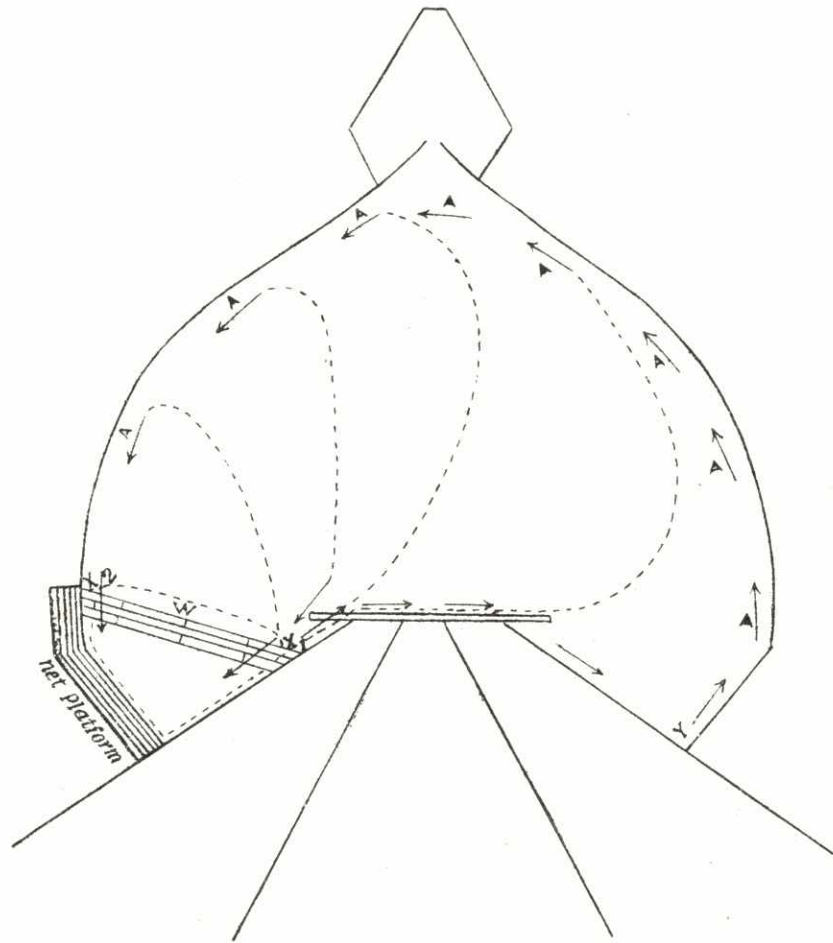


FIG. 12. A schematic drawing showing the catching of fish at the semi-circular enclosure.

fisherman, are needed to operate the scoop seine. The net is dropped at the bamboo bridge (fig. 12W) at X_1 and then extended to Y thus transforming it into a curtain closing the

entrance and gates of the fish corral. The end, at Y, is dragged close to the fence following the direction as indicated by arrow A of fig. 12 until X_2 is reached. This movement is followed by four divers who see to it that the leadline touches the seabed and the fence of the enclosure. Three men on the bamboo bridge hold the floatline while the leadline is brought close to the fence below the net platform and the bottom of the net is raised by pulling the pursed line, thus forming a sort of hammock. Here, the fishes are concentrated at the bunt where they are scooped and placed on the waiting banca. This operation is repeated several times.

THE CATCH

Table 4 is a list of the common fishes caught in the hasang moderno. Most of them are pelagic species which are found on a commercial scale during the season. Shrimps are also caught during the dark phase of the moon specially so when a lamp is used to attract them at the terminal pound.

The catches are sold either to fresh fish vendors, who go to the fish corral during hauling, or to wholesale buyers who are owners of salting plants. Direct icing of the catches is not practiced.

TABLE 4.—Fishes caught by hasang moderno.

English name	Local name	Scientific name
Anchovies	Bolinao	<i>Stelephorus</i> spp.
Bañgos	Bañgos	<i>Chanos chanos</i> .
Barracuda	Batog	<i>Sphyraena</i> spp.
Big-eyed scad	Bocawan nga buca	<i>Selar crumenophthalmus</i> .
Cavalla	Ampalian	<i>Caranx</i> spp.
Do.	Maming	Do.
Do.	Balilin	Do.
Do.	Momsa	<i>Caranx sexfasciatus</i> .
Devil fish	Sunga	<i>Mobula</i> spp.
Drepane	Bayang	<i>Drepane punctata</i> .
Grouper	Lapu-lapu	<i>Epinephelus</i> spp.
Guitar fish	Sodsod	<i>Rhynchobatus djiddensis</i> .
Hair tail	Liwit	<i>Trichiurus haumela</i> .
Leather jackets	Salindato	<i>Scomberoides</i> spp.
Mackerel	Bulao	<i>Rastrelliger chrysozonus</i> .
Do.	Aguma-a	<i>Rastrelliger brachysomus</i> .
Moon fish	Habas	<i>Mene maculata</i> .
Pampano	Mariano	<i>Caranx</i> spp.
Shark	Pating	Galeidæ.
Skipjacks	Tulingan	<i>Katsuwonus pelamis</i> .

English name	Local name	Scientific name
Spanish mackerel	Tangigue	<i>Scomberomorfis commersoni</i> .
Swordfish	Malasugi	<i>Xiphias gladius</i> .
Yaito tuna	Bantala-an	<i>Euthynnus</i> spp.
Yellow tuna	Tulingan	<i>Neothunnus macropterus</i> .

MISCELLANEOUS

Squid	No-os	<i>Loligo</i> spp.
Porpoises	Lumba-lumba	
Shrimps	Alamang	Atyidae.

CAPITALIZATION AND CATCH OF A NEW "HASANG MODERNO" OPERATED AT KALIBO, CAPIZ, IN THE SUMMER MONTHS OF 1950

A. Capitalization:

1. Equipment—

One banca, 14 m. × 1 m. × 0.54 complete with outrigger on one side.....	P250.00
One banca, 3.84 m. × 0.7 m. × 0.49 m., flat bottom	50.00
One ring net (signin), 25.82 m. head rope × 12.19 m. breast line × 22.55 m. ground rope, complete with floats weights and pursing devices.....	1,405.00
One shrimp net (sinamay), 7.75 m. × 3.43 m. × 8.43 m., complete with rings and pull ropes.....	50.00
One scoop net with handle.....	5.00
Eight pieces of oars.....	20.00
Total for equipment.....	P1,780.00

2. Supplies—

1,187 pcs. bamboos without spines, each at least 10 m. long.....	P842.00
350 pcs. bamboos, with spines at least 10 meters long.....	350.00
2,050 pcs. split rattan.....	58.00
15,000 pcs. coconut inflorescence bud scale sheaths	195.00
1 roll Manila rope, 1/2" diameter.....	67.00
Total for supplies	1,512.00
Grand Total	P3,292.00

B. Cost of operation:

1. Licenses—for a year lease of the fishing ground	P750.00
2. Taxes—	
Privilege tax	10.00
Sales tax—5 per cent of gross sale.....	503.75
3. Supplies—rattan, bamboos, twines, nettings, etc., needed for repairs.....	300.00
4. Labor—	
For splitting bamboos including cleaning of splits	45.00
5. For lacing bamboo splits into bamboo screens	350.00
6. For setting the fish corral.....	51.25
Total cost of operation.....	P2,610.00

C. Sales: Total sales from April 1, 1950 to October 15, 1950....

P10,074.62

Months	Fish caught	Sales
April	2,649.00	P2,560.20
May	5,170.75	3,146.32
June	5,107.00	1,350.26
July	1,747.50	789.31
August	560.80	537.70
September	1,033.00	815.36
October (1-15)	960.00	896.47
Total	17,288.05	P10,074.62

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ILLUSTRATIONS

TEXT FIGURES

- FIG. 1. Hasang moderno (1932) diagrammatic: *g*, entrance; *l*, leader; *m*, gate; *w*, wing; *el*, elbow; *fc*, forechamber; *se*, side gate; *si*, semicircular compartment; *tp*, terminal pound.
2. The new hasang moderno: *AB*, leader; *CE*, and *XZ*, lower wings; *JH* and *TV*, upper wings; *EX*, *GH*, *G'T*, gates; *DFGG'WY*, forechamber; *IKSRK'UT*, semicircular enclosure; *LMNOOPQ*, terminal pound.
 3. The uprights or frames: *a*, uprights; *b*, braces; *c*, a bundle of two bamboos.
 4. A diagrammatic presentation of a portion of the terminal pound and semicircular enclosure showing the lacing of the slats: *a*, uprights; *b*, brace; *c*, bamboo screen; *d*, lacing.
 5. A diagrammatic presentation of a portion of the bamboo matting used at the wings, forechamber and leader showing how the slats are laced: *a*, bamboo post; *b*, brace; *c*, bamboo screen; *d*, lacing.
 6. Structural plan of the sign: *A* and *B*, bunt; *C* and *D*, wings; *E*, *F*, *G* and *H*, selvages; *i*, breastline; *j*, secondary leadline; *l*, lead weight; *k*, primary leadline; *m*, bridle; *n*, ring; *o*, secondary floatline; *p*, primary floatline; *q*, pursing rope; *r*, eye splice.
 7. A portion of the headline: *a*, eye splice; *b*, float; *c*, primary floatline; *d*, secondary floatline; *e*, lacing line; *f*, breastline.
 8. A diagrammatic presentation of the structural plan of the shrimp net (not drawn to scale): *a*, sinamay cloth; *b*, sling; *c*, G.I. ring; *d*, hanging line; *e*, lacing line.
 9. Top view of the main boat; *a*, hallow keel; *b*, bow; *d*, wooden planking; *c*, stern; *e*, bamboo for oar-locks; *f*, outrigger.
 10. The lateral and side views of the small boat: *a*, bamboo oarlocks; *b*, planking.
 11. The terminal pound showing how the shrimp net is laid out during fishing operation. ABCD the net.
 12. A schematic drawing showing the catching of fish at the semicircular enclosure.